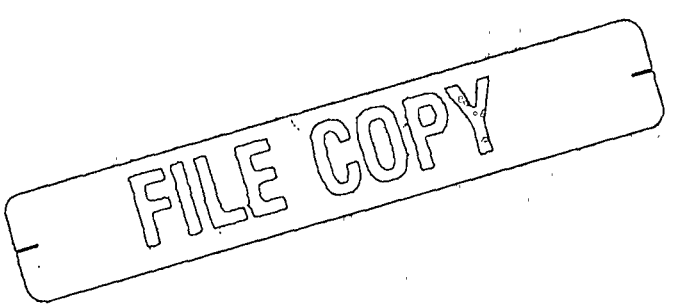

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Development Strategies in Semi-industrial Economies

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Development Strategies in Semi-industrial Economies

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Preface

THIS VOLUME provides an analysis of development strategies in semi-industrial developing economies, which have already established an industrial base. The volume includes studies of Argentina, Colombia, Israel, Korea, Singapore, and Taiwan, prepared by using a common methodology. The comparative analysis presented in Chapter 3 also draws on the experience of Brazil, Chile, India, Mexico, and Yugoslavia. Within the latter group, Brazil, Chile, and Mexico, along with Pakistan, the Philippines, and Norway, were studied in an earlier World Bank research project, the findings of which were published in *The Structure of Protection in Developing Countries.*[1]

The present investigation focuses on the systems of incentives applied and their effects on economic performance. It covers countries at similar levels of development so as to ensure comparability in the results. The study extends the concept of effective protection by introducing the concept of effective subsidy, which incorporates credit and tax preferences in addition to protective measures. Emphasis is further given to the relative incentives provided to exports and to import substitution.

Relative incentives to exports and to import substitution provide a basis for classifying development strategies as outward oriented or inward oriented. This distinction is made according to whether sales in domestic and export markets receive similar incentives, or whether import substitution is favored over exportation. Other characteristics of alternative development strategies and their economic effects are also examined in the volume.

The introduction provides definitions of incentive measures and indicators of incentives, together with a brief outline of the volume. The chapters of Part I examine conceptual and measurement issues, present the results of the individual studies in a comparative framework, analyze the effects of alternative development strategies on economic performance, and provide recommendations for an "ideal" system of incentives. Part II of the volume contains the studies of the six semi-industrial developing economies.

The individual studies were undertaken by experts, most of whom at one time or another have performed official functions or served as advisors to the governments of the countries concerned. The study on Argentina was carried out by Julio Berlinski, a former senior economist at CONADE (the Argentine planning agency) and at present senior research fellow at the Di Tella Institute, Buenos Aires, and by Daniel M. Schydlowsky, professor of economics at Boston University and formerly an advisor to CONADE. The authors of the Colombia study are Thomas L. Hutcheson, who spent two years in Colombia with CODEPLAN (the Colombian planning agency) and is now a senior economist at the World Bank, and Daniel M. Schydlowsky.

The study on Israel was undertaken by Zvi Sussman, director of the Research Department and subsequently deputy governor of the Bank of Israel. The authors of the Singapore study are Augustine H. H. Tan, associate professor of economics at the University of Singapore and member of Parliament, and Ow Chin Hock, lecturer at the University of Singapore and parliamentary secretary, Ministry of Culture.

The study on Korea was written by Larry E. Westphal, a former advisor to the government of Korea and at present chief of the Economics of Industry Division of the Development Economics Department at the World Bank, and by Kwang Suk Kim, vice-president of the Korea Development Institute. The authors of the study on Taiwan, professors T. H. Lee and Kuo-shu Liang, are currently the mayor of Taipei City and chairman of the First Commercial Bank of Taiwan, respectively.

The individual studies were carried out with the support of the governments concerned, which also defrayed some of the costs and provided other assistance. The bulk of the cost of the research project was borne by the World Bank. The opinions expressed in the volume, however, should not be interpreted to reflect those of the Bank or the individual governments.

Several chapters of Part I draw on my work published in the *Journal of Development Economics*, *Quarterly Journal of Economics*, *Weltwirtschaftliches Archiv*, *World Development*, in the lecture series on *Commercial Policy*, in the

proceedings of a conference entitled *International Trade and Finance: Frontiers of Knowledge*, and in a joint paper with Daniel M. Schydlowsky that appeared in the proceedings of a conference on *The Role of the Computer in Economic and Social Research in Latin America*. Also, Chapter 4 in part relies on my advisory reports for developing country governments that were collected in the volume *Policy Reform in Developing Countries*.[2] The publishers in question have given permission for the use of published material.

The Argentina and the Colombia studies appeared in the Working Papers of the Boston University Center for Latin American Development Studies; a Spanish translation of the Argentina study was published by the Central Bank of Argentina. Papers underlying the Israel study were published by the Bank of Israel. Finally, the Korea study appeared in the Staff Working Papers of the World Bank and was published in Korean by the Korea Development Institute.

I wish to thank my collaborators for their dedication to the arduous task of preparing the individual studies. Thanks are also due to Montek Ahluwalia, Jaime de Melo, Alan Gelb, Daniel M. Schydlowsky, T. N. Srinivasan, and Larry E. Westphal for helpful comments on the chapters of Part I. I am under great obligation to Rachel Weaving whose skillful editing has improved the style and in places the content of the volume. Finally, I am indebted to Kishore Nadkarni for research assistance beyond the call of duty and to Norma Campbell who has patiently borne much of the burden of typing successive drafts. Venka V. Macintyre prepared the final manuscript for publication, Harry Einhorn read proof of the book, and Ralph Ward and James Silvan prepared the index.

Valuable comments on an earlier version of the volume were made by anonymous referees who reviewed the volume for the Publications Committees of the World Bank. The version reviewed by the referees was completed before the publication of the comparative volumes by Jagdish Bhagwati[3] and Anne Krueger,[4] reporting on the findings of a research project on foreign trade regimes and economic development prepared under the auspices of the National Bureau of Economic Research, and by Juergen Donges and Lotte Muller-Ohlsen[5] reporting on the findings of a research project on export strategies and industrialization in developing countries carried out at the Kiel Institute of World Economics. Whenever considered useful, references to those reports have been included in the final version of this volume.

Bela Balassa
Project Director

Footnotes to the Preface

1. B. Balassa and Associates, *The Structure of Protection in Developing Countries* (Baltimore, Md.: Johns Hopkins University Press, 1971).
2. B. Balassa, *Policy Reform in Developing Countries* (Oxford: Pergamon Press, 1977).
3. J. N. Bhagwati, *Foreign Trade Regimes and Economic Development: Anatomy and Consequences of Exchange Control Regimes* (Cambridge, Mass.: Ballinger Publishing Co., 1978).
4. A. O. Krueger, *Foreign Trade Regimes and Economic Development: Liberalization Attempts and Consequences* (Cambridge, Mass.: Ballinger Publishing Co., 1978).
5. J. B. Donges and L. Muller-Ohlsen, *Aussenwirtschaftsstrategien und Industrialisierung in Entwicklungslandern*, Kieler Studien 157 (Tubingen: J. C. B. Mohr [Paul Siebeck] for the Institut fur Weltwirtschaft an der Universitat Kiel, 1978).

Key to Tables

E	Export sales
D	Domestic sales
A	Average in both markets
X	Export products: at least 10 percent of domestic output is exported
XIC	Export-and-import-competing products: at least 10 percent of domestic output is exported, and at least 10 percent of domestic supply is imported
IC	Import-competing products: at least 10 percent of domestic supply is imported
NIC	Non-import-competing products: less than 10 percent of domestic output is exported, and less than 10 percent of domestic supply is imported
n.a.	Not available
n.d.	Not defined
—	Nil
0	Less than 0.5

Note: Whenever a separate indication of data sources is not provided in the tables, the relevant sources are indicated in the text.

Development Strategies in Semi-industrial Economies

Introduction

BELA BALASSA

This study endeavors to quantify the systems of incentives applied in six semi-industrial developing economies and to indicate the effects of these systems on resource allocation, international trade, and economic growth. The effects of the incentives applied in the six economies studied in detail in Part II of the volume and in five other semi-industrial economies are further evaluated in a comparative framework and recommendations are made on incentive policies.

The introduction provides definitions of incentive measures and of indicators of incentives, which are used to quantify the incidence of incentive measures for particular economic activities. For a more detailed discussion of conceptual and measurement issues, see Chapter 1.

Incentive Measures

The term "incentives" is used in the volume to refer to governmental measures that affect the allocation of resources—land, labor, and capital—among industries, and that influence the orientation of economic activities as between exportation and import substitution. Incentives are defined to include protective measures and credit and tax preferences.

Protective measures bear upon imports and exports. Imports are affected by tariff-type measures, such as ad valorem tariffs, specific duties, import taxes and subsidies, requirements for advance deposits in payment for imports, and differential indirect taxes, as well as by quantitative restrictions in the form of import licensing, quotas, or import prohibition. Exports may be taxed or subsidized. The pattern of trade may also be influenced by multiple exchange rates, which have an effect equivalent to import tariffs (or subsidies) combined with export subsidies (or taxes).

In providing different incentives to the production of exports and import substitutes, protective measures may discriminate among economic activities. Although credit and tax measures also affect the allocation of resources among industries, they are not necessarily linked to exportation or to import substitution. Preferential credits in the form of low-cost loans by governmental institutions may be provided to individual industries, to exports and to import substitution, or to selected regions. Particular industries, export or import-substituting activities, and individual regions may also receive special tax treatment (for example, eligibility for tax holidays or allowances for accelerated depreciation) or investment grants.

Indicators of Incentives

Various indicators may be used to quantify the incidence of incentives or particular economic activities. The rate of nominal protection expresses the effects of protective measures on the price received for a product by its domestic producers. The rate of effective protection relates the joint effects of protective measures on the price of the product and on the prices of its inputs to value added in the production process. The rate of effective subsidy relates the combined effects of protective measures and credit and tax preferences to value added. These indicators will be briefly described in turn.

For products that are not subject to quantitative restrictions or prohibitive tariffs on imports, the nominal rate of protection may be taken to equal the rate of import tariff or, more generally, the ad valorem equivalent of tariff-type measures. The nominal rate of protection will thus indicate the extent to which tariffs and tariff-type measures raise the domestic price above the c.i.f. (cost, insurance, and freight) import price.

Whereas tariffs influence import levels indirectly by raising the domestic price of imported goods, quantitative restrictions directly set permissible import levels in terms of volume or value. By limiting the amount of imported commodities available on the domestic market, quantitative restrictions, too, raise the domestic prices of the commodities in question above their c.i.f. prices.

In cases where imports are subject to quantitative restrictions, the nominal rate of protection has been estimated as the percentage difference between the domestic producer price and the c.i.f. import price of equivalent products. The same procedure has been applied in cases where tariffs appear to be prohibitive—that is, whenever, imports are nonexistent or negligible.

The prices received for exports may be raised by export subsidies or reduced by export taxes. As a general rule, the nominal rate of protection for export products has been taken to equal the ad valorem rate of these subsidies and taxes, as the case may be.

Although the rate of nominal protection expresses the effects of protective measures on the price of a particular product received by its domestic producers, producers are concerned not only with the price of their output but also with the cost of the inputs used in the production process. To the extent that protection raises the cost of these inputs to the producer, it can be considered a tax on their use.

The effective protection measure is designed to indicate the combined effects of output and input protection on the processing activity. The rate of effective protection is defined as the percentage difference between the value added in domestic prices, obtainable as a result of the application of protective measures, and value added in world market prices. Value added is the difference between the price of the product and the cost of intermediate inputs; its components include wages, profits, and interest payments. Value added in domestic prices, or domestic value added, is derived by valuing the product and its intermediate inputs in domestic prices. Value added in world market prices, or world market value added, is obtained by valuing the product and its intermediate inputs in world market prices; it indicates the domestic currency equivalent of the net foreign exchange saved through import substitution or earned through exportation.

Whereas effective rates of protection indicate the joint effects of output and input protection, the effective rate of subsidy expresses the combined effects of protective measures and credit and tax preferences. As a first step in estimating the effective rate of subsidy for an activity, we adjust value added expressed in domestic prices by the equivalent of the credit and tax preferences, defined as the difference between their average values for all activities and observed values for the particular activity. The effective rate of subsidy is then calculated as the percentage excess of adjusted domestic value added over world market value added.

Outline of the Volume

Chapter 1 is concerned with the quantification of incentive measures, the estimation of the indicators of incentives, and the conceptual and empirical problems of estimation. Formulas used to estimate the individual indicators appear in the appendix at the back of the book.

The nontechnical reader may wish to proceed directly to Chapter 2, which presents estimates of the rates of nominal protection, effective protection, and effective subsidy in the six semi-industrial economies examined in detail in Part II. Estimates are provided for ten industry groups, distinguished according to the degree of transformation and the final uses of their products, and also for four trade categories: export, export-and-import-competing, import-competing, and non-import-competing industries. Relative incentives to sales in domestic and in export markets are also analyzed, and a distinction is made between the incentives for traditional and nontraditional exports. The estimates in Chapter 2 pertain to the late 1960s and, apart from those for Singapore, are representative of the period up to the oil crisis of 1973.

Chapter 3 briefly describes the incentive systems applied in the six economies studied in detail and in five other semi-industrial developing economies, focusing on changes since World War II. It further analyzes the effects of alternative development strategies on export growth and the effects of export growth on economic growth, employment, and income distribution in the eleven economies.

Chapter 4 proposes ways of remedying distortions in capital and labor markets and in public utility pricing in semi-industrial developing countries. It further presents recommendations on trade policies and considers alternative ways of implementing the proposed system of incentives under the threat of foreign retaliation to export subsidies. Finally, the chapter describes the measures that may be necessary to accomplish a transition to

the proposed system from a situation in which exports face discrimination and markets are highly distorted.

The comparative evaluation in Part I is based on the principal conclusions of the six individual studies, on information regarding the other five semi-industrial economies under consideration, and in Chapter 4 also on the author's experience as policy advisor to governments of developing countries. The individual studies of Part II should be consulted, however, for greater depth and richness of analysis and for additional detail.

The individual studies provide a survey of policy changes undertaken since World War II, estimates of the various indicators of incentives, an analysis of the economic effects of the systems of incentives applied, as well as recommendations for the future. The studies use a common methodology, but differ in emphasis according to conditions in the individual cases. The analysis and the policy recommendations are based on the situation before the oil crisis of 1973 and do not consider subsequent developments.

PART I

Comparative Analysis

1

Incentive Measures: Concepts and Estimation

BELA BALASSA

For purposes of this study, incentives have been defined to include governmental measures that affect the allocation of resources among economic activities and their orientation between foreign and domestic markets. The application of incentive measures thus entails a departure from a neutral state of affairs in which there is no discrimination among economic activities or between foreign and domestic markets.

In evaluating a system of incentives, one may undertake two distinct tasks: gauging the incidence on product prices of the incentive measures applied, and predicting their economic effects. The first task involves ascertaining whether and to what extent the incentives applied favor (or disfavor) a particular activity relative to other activities, and whether an activity receives net incentives (disincentives) as compared with the neutral state of affairs. The second task entails analyzing the effects of the incentives on the allocation of resources and other economic variables.

Ideally, the incidence of incentive measures and their economic effects should be analyzed in a general equilibrium framework. Such analysis would require a counterfactual experiment to estimate the values of the relevant variables for the event that neutrality applies. A comparison of the values predicted by the model under the actual system of incentives and under the counterfactual experiment would then indicate the incidence, and the economic effects, of the incentives applied.

The literature contains several attempts to analyze the effects of protective measures in a general equilibrium framework. For various reasons, however, this approach has not been taken in the present investigation. To begin with, computational limitations restrict the number of variables that may be included in an empirically estimated model. Also, a general equilibrium model has considerable information requirements, and specifying the parameters of production functions and demand functions inevitably involves arbitrary choices. Furthermore, a general equilibrium approach involves modeling the entire national economy—an undertaking that is beyond the scope of the present investigation. Hence we have limited ourselves to an analysis of incentives in a partial equilibrium framework.

The question arises, then, to what extent the indicators of incentives estimated in a partial equilibrium framework are useful for gauging the incidence of the incentive measures applied and for predicting their economic effects. This question will be taken up, following an examination of conceptual and measurement issues relating to the estimation of nominal rates of protection.

Estimating Nominal Rates of Protection

Developing countries cannot generally affect the prices of the goods they import. It will thus be assumed throughout this chapter that import prices in these countries are exogenously given. Initially, it will also be assumed that quantitative import restrictions are not applied and that tariffs are not prohibitive.

Tariffs as a Measure of the Nominal Rate of Import Protection

We shall use the expression "tariff" to refer to the ad valorem equivalent of all tariff-type measures, taken together, on c.i.f. import value. The ad valorem equivalent of specific duties, levied on a per unit basis, is obtained by relating the amount of duties paid to the c.i.f. value of imports. Import taxes and subsidies, too, can be directly related to import value. The tariff equivalent of advance deposits required in payment for imports (or prepayment requirements) is calculated from data on the length of the period of prepayment, the size of the deposit required, and the interest rate at which money can be borrowed to make such deposits. Finally, rates of indirect taxes on imports that exceed (or fall short of) tax rates on the comparable domestic product are deemed to have the same effect as import tariffs (or subsidies).

Under these assumptions, the domestic price of imported goods will equal the sum of the c.i.f. import price and the tariff. The domestic price of home-produced goods will be the same as the domestic price of imports inclusive of tariffs, provided that the home-produced and the imported varieties of the product are in all respects identical (that is, the product is homogeneous). Since the domestic price of home-produced goods rises by the full amount of the tariff, the nominal rate of protection will be equal to the ad valorem tariff rate.

Homogeneous products whose domestic prices are determined by the c.i.f. import price and the tariff, whether they are of domestic origin or imported, are "fully traded" goods in Joshi's terminology.[1] As the elasticity of substitution between the domestic and imported varieties of such products is infinite, domestic supply conditions will affect only the quantity produced domestically, while domestic demand conditions will affect only the quantity consumed of the domestic and the imported varieties combined.

Alternatively, the imported variety of a good may differ from the variety produced domestically, so that the elasticity of substitution between them is not infinite. In this event, the price of the imported variety will still equal the sum of the c.i.f. import price and the tariff. However, the price of the domestic variety of the product, the quantity produced domestically, and the domestic consumption of both the imported and the domestic variety will now be influenced by domestic demand and supply conditions. Thus, where products are not homogeneous, the effect of an import tariff on the price of the domestic variety will depend on the price elasticity of domestic supply, the price elasticity of domestic demand for the domestic and foreign varieties combined, and the elasticity of substitution in consumption between the two varieties.[2]

Detailed product classification schemes have made it possible to minimize these complications in the present study. At the level of disaggregation used, products that are available in both domestic and imported varieties tend to be homogeneous, either because they are standardized (for example, agricultural commodities, pulp and paper, steel, nonferrous metals), or because they are produced in the importing country under license (mainly machinery and equipment). Thus, the tariff will generally be an acceptable indicator of the nominal rate of protection, provided that the tariff is not prohibitive and that quantitative import restrictions are not applied. Major exceptions are products that are both exported and imported. For such commodities product differentiation exists and comparisons need to be made between domestic and foreign prices to determine the extent of nominal protection.

Quantitative Import Restrictions and Prohibitive Tariffs

Price comparisons also need to be made for products that are subject to quantitative import restrictions or prohibitive tariffs. Under competitive conditions, the percentage excess of the domestic producer price over the c.i.f. import price of identical commodities will measure the tariff equivalent of quantitative import restrictions, since domestic consumption and production will be the same as in the case where a tariff of this magnitude was applied. But if a producer or importer enjoys a monopolistic position, the equivalence of tariffs and quantitative restrictions will no longer hold.[3] While domestic consumption will be the same as under competitive conditions, domestic production will be affected differently by import restrictions than by a tariff that raises prices to the same extent.

Nor will the equivalence of tariffs and quotas hold if particular policy objectives are pursued by the government under conditions of uncertainty[4] or if import quotas are distributed among users in proportion to their production or consumption.[5] Similar considerations apply in cases where quotas for imported inputs are linked to existing production capacity,[6] where allocations of imported inputs are nontransferable, or where imports of capital goods are controlled in order to limit the entry of new producers into the industry.[7]

Bhagwati provides a taxonomy of conditions under which the equivalence of tariffs and quantitative restrictions may not hold.[8] The conditions he describes are prevalent in countries with pervasive import restrictions, such as Egypt, India, and Turkey, but are rarely found in the semi-industrial developing economies

under study. The latter generally provide import quotas freely up to an overall limit and impose few limitations on entry. With the exceptions noted below, it may thus be assumed that the equivalence proposition holds.

Correspondingly, in the case of imports that are subject to quantitative restrictions, the nominal rate of protection has been defined as the percentage excess of the domestic price over the c.i.f. import price of identical commodities. The excess of the nominal rate of protection over the tariff rate thus constitutes quota profits that accrue to the importer (provided no charge is made for import licenses), whereas the proceeds from a tariff augment government revenue. In this connection, note that Korea and Taiwan levy import surcharges with the intention of absorbing quota profits.

The same estimation procedure has been followed in the case where tariffs are prohibitive and there are no imports. This has been done in order to allow for the possibility that competition among domestic producers might lower the domestic price of the product below the tariff-inclusive price of potential imports. In such cases, the tariff will indicate the extent of potential protection, while the actual protection will be measured as the percentage excess of the domestic price over the c.i.f. import price of the identical commodity. In this study, the protection actually realized has been taken to equal the nominal rate of protection.

Ideally, prices of domestic and imported products should be compared at the place of consumption. Lack of information on domestic transport costs has made it necessary, however, to compare domestic exfactory and c.i.f. import prices. Price information on products that are not actually imported has been obtained from traders or from foreign suppliers.[9]

Nominal Protection for Export Products

Having considered commodities that are actually or potentially imported, we next turn to the estimation of nominal protection rates for export products that may be sold in domestic as well as in foreign markets. At this stage of the argument, it will be assumed that export prices are exogenously given for the country concerned.

Under competitive conditions and product homogeneity, the producer will receive the same price whether he sells at home or abroad. In this eventuality, the nominal rate of protection on export products sold in domestic as well as in foreign markets will equal the rate of export subsidy or tax. In some cases, however, export products are sold at different prices at home and abroad.

Differences between the domestic prices and the export prices of primary commodities often reflect differences in quality. Producers of foodstuffs in developing countries tend to export the best of the crop, not only because this quality is demanded by foreign consumers but also because it better withstands the rigors of transport. Quality differences are particularly evident among perishable fruits and vegetables, where the quantity left after exporting may be made available in the domestic market. Also, the product variety best suited to foreign tastes may command a higher price than other varieties. It has been noted, for example, that Japanese consumers demand eels of a certain size and that those smaller or larger remain for the Taiwanese home market.

Unless evidence was available to the contrary, we have assumed that observed price differences for primary commodities sold in domestic and in foreign markets originate in differences in quality or product variety. Correspondingly, we have equated the nominal rate of protection on both domestic and foreign sales to the rate of export subsidy or tax.

For some primary products, however, price differences are due to the actions of a government trade monopoly. In such intervals the nominal rate of protection has been taken to equal the margin accruing to the government trade monopoly, which has the same function as an export tax. This has been the case for Korea's exports of ginseng: the country's large share of the foreign market makes it profitable to raise the export price above the competitive level.

Export prices may exceed domestic prices because of quality differences in the case of manufactured goods as well (for example, Korean plywood and wigs). In such cases, as for primary commodities, we have equated the nominal rate of protection to the rate of export subsidy or tax. The same procedure has been followed in the rare instances, as in the case of some of Korea's textiles, where firms export products of lower quality to the United States and Japan and sell a superior variety at home.

Finally, in a few cases, domestic prices exceed export prices for indentical products. Such behavior is consistent with oligopolistic profit maximization in geographically separated markets, with domestic prices being maintained above world market levels under protection. In these instances, the nominal rate of protection on domestic sales has been taken to equal the percentage excess of the domestic over the f.o.b. (free on board) export price, adjusted for export subsidies and taxes. The nominal protection of export sales has been taken to equal the export subsidy or tax.

Product Classification

In the practical application of the described procedures to estimate nominal rates of protection, commodities have been classified into four trade categories: export, export-and-import-competing, import-competing,

and non-import-competing. The first category comprises goods of which more than 10 percent of domestic production is exported, while imports account for less than 10 percent of domestic consumption. For commodities that are classified as export-and-import-competing, both of these shares exceed 10 percent. Commodities of which less than 10 percent of domestic production is exported are classified as either import-competing or non-import-competing, depending on whether more, or less, than 10 percent of the domestic consumption of these products is imported.

The nominal rate of protection on both the domestic and the foreign sales of export commodities has been equated to the rate of export subsidy or tax, except where there is evidence of price discrimination between these sales. In such cases the nominal rate of protection of the domestic sales of export commodities has been taken to equal the percentage excess of the domestic price over the export price, adjusted for export subsidies and taxes, while for export sales it has been equated to the rate of export subsidy or tax.

Commodities in the export-and-import-competing category are generally characterized by product differentiation, and thus the imported variety may be priced differently than the domestic variety that is also exported. As a general rule, the nominal rate of protection of these commodities has been equated to the percentage excess of the domestic price over the world market price for sales in the domestic market, and to the rate of export tax or subsidy for export sales.

Commodities classified as non-import-competing may not be imported because protection is prohibitive, or because their production is on the borderline between import substitution and export. In Korea and Taiwan, for example, several domestic products are competitive with imports in domestic markets but, given the cost of transport, they have not yet entered export markets.

The nominal rate of protection of non-import-competing commodities has been taken as the percentage excess of domestic over c.i.f. import prices. The same procedure has been followed for those commodities in the import-competing category that are subject to quantitative import restrictions. For other import-competing commodities, the nominal rate of protection has been equated to the rate of tariff.

Sectoral Classification and Averaging

We have indicated that under a variety of circumstances estimating the nominal rate of protection requires comparisons between domestic and foreign prices. Since such comparisons could not be made for every commodity, a sampling procedure had to be employed. A stratified sample of commodities was drawn from each sector in the national input-output tables, with the inclusion of commodities from all four trade categories represented in the sector.

For each sector, averages of nominal rates of protection for the sales in domestic and in export markets were calculated by using the world market values of the sales of the individual commodities in domestic and export markets, respectively, as weights. The world market value of sales was also used in deriving the average rate of nominal protection for the total (domestic and export) sales of the sector.

The same weighting procedure was employed in averaging sectoral results according to a trade as well as an industrial classification scheme. In the first case, sectors were classified as export, export-and-import-competing, import-competing, and non-import-competing by applying the criteria described above on the sectoral level. In the second case, sectors were assigned to ten industry groups on the basis of the degree of fabrication and final uses of their products. The industrial classification scheme will be described in Chapter 2, where the empirical results are presented.

Nominal Rates of Protection of Inputs

To calculate effective rates of protection, it is necessary to estimate the nominal rates of protection of the intermediate inputs used in the production process. Among these inputs, a distinction is usually made between tradeable and nontraded commodities. The former are commodities that are actually traded or would be traded if protection were not prohibitive. Nontraded goods, comprising transport and communications, commerce, and a variety of public and private services, do not enter international trade.

To determine the nominal rate of protection of domestically produced tradeable inputs, we have applied the procedures used for determining the nominal rate of protection of output, described above. For imported inputs the nominal rate of protection has been equated to the tariff on the assumption that import licenses, if any, are received by the users of these inputs. The treatment of nontraded inputs will be considered in the following section.

Estimating Effective Rates of Protection

In measuring the change in the price of output that is caused by protection, the concept of the nominal rate of protection performs the first task noted in the introduction to this chapter, that is, to gauge the incidence of protective measures on *product prices*. It may also be used

to perform the second task, that is, to predict changes in the *quantity of output* resulting from the application of protective measures. These uses of the nominal rate of protection, however, depend on the assumption that the production process transforms primary factors into final products, using no intermediate products. As businessmen have long recognized, where intermediate products are used, the protection of a particular activity will be effected by the incidence of tariffs and other protective measures not only on the output but also on the intermediate inputs.

The Concept of Effective Protection

The concept of the effective rate of protection has been introduced to gauge the joint incidence of output and input protection on the processing activity and to examine their effects on the allocation of resources.[10] It performs the first task by indicating the percentage change in the price of value added owing to the imposition of protective measures, which has come to be used as the definition of the effective rate of protection.[11] The effective rate of protection can also perform the second task, by predicting changes in the *quantity of value added.*[12]

The price and the quantity of value added have been defined under the assumption that the production function is separable as between primary factors and intermediate inputs—that is, that substitution elasticities are the same between any pair of primary factors and intermediate inputs. Under this assumption, the effective protection concept can be used to indicate the incidence of protective measures on the remuneration of primary factors (changes in the price of value added) and to predict the ensuing resource flows (changes in the quantity of value added), following a small change in the protection of a processing activity.[13] In the event of large changes in protection, however, we face the so-called index number problem as a choice needs to be made between the use of preprotection and postprotection weights (input-output coefficients) in the calculations.

The Index Number Problem

The index number problem will not arise, and the incidence of protective measures and their resource flow implications can be indicated for large changes in protection, if all input coefficients are constant. Furthermore, in this case, the effective protection concept can be reinterpreted as the percentage excess of value added in domestic prices (domestic value added) under protection over value added in world market prices (world market value added).

The assumption of constant input coefficients has been customary in empirical estimates of effective protection. The question needs to be raised, then, to what extent input substitution will modify the conclusions derived from effective protection estimates obtained under this assumption. In considering this question the assumption of the separability of the production function will be retained, but it will be removed subsequently.

It has been shown that substitution between primary factors, taken as a unit, and intermediate inputs, taken together, will give rise to an overestimation of effective protection rates calculated using input-output coefficients observed under protection and to the underestimation of effective rates calculated from input-output coefficients that would obtain under free trade.[14] The same conclusion applies if there is substitution among intermediate inputs.[15] By contrast, substitution among primary factors will not give rise to bias.[16]

Hypothetical calculations have been made to correct effective protection estimates obtained under the assumption of constant input coefficients for assumed values of substitution elasticities between primary factors, taken as a unit, and intermediate inputs, taken together. In a study of twenty-eight Argentine industries, Humphrey and Tsukahara have obtained a rank correlation coefficient of 0.88 for effective rates of protection estimated under the assumption of zero and of unitary elasticities, respectively.[17]

The small size of the sample limits the confidence that can be placed in the Humphrey-Tsukahara results. A much larger sample has been used for the United States. Using estimates made in a 135-sector breakdown, Witthans obtained a rank correlation coefficient of 0.98 between effective rates calculated on the assumption of substitution elasticities, between primary factors and intermediate inputs, of zero as against one half and zero as against two.[18] The extent of correlation is reduced only slightly if allowance is made for the possibility that substitution elasticities vary among sectors, although rankings may change within narrow industrial subgroups.[19]

It appears, then, that the introduction of nonzero substitution elasticities between primary factors, on the one hand, and intermediate inputs, on the other, will not appreciably affect the structure of protection estimated under the assumption of constant coefficients. This conclusion is strengthened if we introduce evidence that substitution elasticities between primary factors, on the one hand, and intermediate inputs, on the other, cluster around one. In an international comparison, Watanabe has obtained unitary substitution elasticities beween primary factors, taken together, and major intermediate inputs, taken individually, for sixteen industries.[20] In an investigation of U.S. industries, Humphrey has found

that substitution elasticities between primary factors, taken as a unit, and intermediate inputs, taken together, are around unity.[21]

These results can be extended to substitution among intermediate inputs. Watanabe's estimates show unitary substitution elasticities among intermediate inputs as well. According to Bhagwati and Srinivasan, changes in the price of value added can be unambiguously defined and the ensuing resource flows predicted as long as substitution elasticities between primary factors and intermediate inputs, as well as among intermediate inputs, are unity.[22]

The Separability of the Production Function

It appears, then, that under the assumptions made, the bias in the estimates owing to input substitution will not materially affect the incidence of protective measures estimated under the assumption of constant input coefficients. Also, resource flows following changes in the protection of a processing activity, as measured by the effective rate of protection, can be predicted as long as substitution elasticities between primary factors and intermediate inputs, and among intermediate inputs, are unity. The latter appears to be the case from available empirical estimates.

The empirical estimates of substitution elasticities combine primary factors in a single unit, however, and are thus based on the assumption that the production function is separable.[23] In this connection, two questions arise: How important are possible deviations from the separability condition in practice? And how much will the empirical results be affected thereby?

Taken in conjunction with interindustry differences in factor intensities, the observed constancy of substitution elasticities between primary factors, taken as a unit, and individual intermediate inputs suggests that differences in substitution elasticities between pairs of primary factors and intermediate inputs may not be of consequence. An indirect test of how estimates of the incidence of protection are affected by the separability of the production function, and by input substitution in general, lends support to this conclusion.[24]

The volume *Structure of Protection in Developing Countries* reports effective protection rates estimated for seven countries using both domestic (postprotection) and hypothetical free-trade (preprotection) input-output coefficients; the latter were derived from the input-output data of countries that do not substantially deviate from free trade. It has been concluded that

> with the exception of Malaysia, the interindustry pattern of effective protection is little affected by the choice of the input-output coefficients . . . Differences in the results obtained under the two alternatives are largely explained by considerations unrelated to substitution among inputs, such as the level of industrial development and the weighting scheme employed . . . It appears, then, that in practical instances errors due to substitution among inputs do not substantially affect the estimates of effective rates of protection.[25]

These results have been obtained with respect to value added adjusted for depreciation, or net value added, so that they also reflect substitution between labor and machinery. In the case of Chile, estimates have also been made with respect to gross value added (that is, including depreciation) in the framework of research project on the Structure of Protection in Developing Countries. These unpublished estimates show that the effective rates of protection derived by the use of the two methods are highly correlated.

The fact that substitution elasticities between primary factors and intermediate inputs cluster around one, and the apparent insensitivity of the effective protection estimates to the choice of preprotection and postprotection coefficients, point to the conclusion that input substitution may not substantially modify the results obtained under the assumption of constant input coefficients. This conclusion, in turn, limits the likelihood of perverse results involving the shift of primary factors from an industry with lower, to one with higher, effective rates.

Error Possibilities in the Estimation of Effective Rates

In the present investigation, input substitution has been disregarded and effective rates of protection have been estimated from domestic input-output coefficients in each of the six economies under study. This choice reflects the view that while examples can be easily provided in which input substitution modifies the results, in developing countries where effective rates vary widely among industries, the empirical relevance of the substitution issue is likely to be limited.[26] Further evidence on this point will be provided in the discussion of estimates obtained in a general equilibrium framework.

At the same time, it should be recognized that other sources of error also affect the estimation of effective protection rates. Errors may result from the lack of consideration given to the effects of protection on the capital cost of carrying inventories. Nevertheless, in a study of thirty Pakistani industries, Guisinger and Schydlowsky have found that adjusting for this cost left the ranking of industries by effective rates virtually unchanged.[27]

Furthermore, errors of estimation may result if production takes place under increasing or decreasing returns to scale; these errors may lead to overstatement of effective rates in the first case and understatement of effective rates in the second.[28] Although this bias means that we tend to underestimate effective rates of protection in manufacturing activities, no adjustment has been made on this account for reliable data on economies of scale.

Errors of estimation may also arise from the incorrect measurement of nominal rates of protection, which can be shown to affect results to a considerable extent. Effective protection estimates are also sensitive to errors in the value added coefficient.[29] Finally, estimates based on the data of a single year will be affected by business conditions in that year.

The Treatment of Nontraded Inputs

Under the assumption of constant input coefficients, the calculation of effective rates of protection is straightforward wherever all intermediate inputs are tradeable goods whose domestic prices are affected by protection. In turn, alternative methods have been suggested for treating nontraded inputs.

Under the so-called Corden method, value added in the production of nontraded inputs is combined with value added in the processing activity, whereas the intermediate inputs used in the production of nontraded inputs are included with the intermediate inputs used directly in the processing activity. Thus, the effective rate of protection is estimated for the processing activity and for the processing of the nontraded inputs utilized, taken together.

In contrast, under the so-called Balassa method, the effective rate of protection is estimated for the processing activity alone under the assumption that nontraded inputs are supplied at constant costs, where the cost of nontraded inputs is affected by protection-induced changes in the prices of the tradeable inputs used in the production of nontradeable goods. A variant of this measure, used in *The Structure of Protection in Developing Countries*, has been employed by Maurice Scott and has been called the Scott measure by Alok Ray.[30]

In a model encompassing two factors—two tradeable goods and two nontraded goods—Ray has shown that if input-output coefficients for nontraded goods are constant, the Corden measure will correctly indicate the impact of protective measures on output, value added, and factor allocation. Under the assumptions made, the Scott measure will yield correct results only if the ranking of processing activities in terms of factor intensity is unaffected by the inclusion of primary factors used in producing nontraded inputs. The latter conclusion also applies to the Balassa measure. Moreover, while Ray claims that the Scott measure cannot be applied even to a small country without solving the whole system, the Balassa measure can be derived by employing the so-called semi-input-output method, which was first used by Tinbergen.[31]

At the same time, the Corden measure implicitly assumes that otherwise identical nontraded inputs are supplied to different processing activities at different prices. Also, in considering value added in the processing activity jointly with that in the production of nontraded inputs, this measure does not allow for differences in the rates of protection of the processing activity and of nontraded inputs. By comparison, under the Balassa measure, the protection of the processing activity is estimated on the assumption that nontraded inputs are subject to zero effective protection.

In the present investigation, use has been made of both the Balassa and the Corden methods. This has been done in order to examine the implications of the two alternatives for the measurement of effective protection and to test the sensitivity of the results to the treatment of nontraded inputs.

In the case of the five economies for which both Balassa and Corden effective rates have been estimated, the Spearman rank correlation coefficient between the two sets of rates ranges from 0.97 in Colombia to 0.99 in Argentina and in Korea. Given the high rank correlation between the two measures, reporting both sets of calculations in full would provide little additional information. In view of the unavailability of Corden rates for Israel, the comparative chapters of this volume show only the Balassa rates. Where the Corden rates are available, these are reported in the respective studies for total (domestic and export sales) but not for domestic sales and export sales, taken individually.

Estimating the Hypothetical Free-Trade Exchange Rate

While effective protection rates calculated at the existing exchange rate indicate the relative incentives provided to processing activities, the question arises whether the system of protection favors or disfavors a processing activity compared with the neutral state of affairs. A further question is whether a particular activity expands or contracts as a result of the application of protective measures.

To answer these questions, one has first to define a "neutral state of affairs." This phrase has been taken to represent the absence of protective measures, or free trade. If the prices of nontraded goods are considered as the numeraire, it will then be necessary to determine

how the exchange rate is affected by the application of protective measures.[32]

The imposition of protective measures will generally permit equilibrium in the balance of trade to be reached at a lower exchange rate than under free trade, since an appreciation of the exchange rate is required to compensate for the fall in imports brought about by protection.[33] Conversely, eliminating protective measures would necessitate a devaluation in order to offset the resulting deficit in the balance of trade.

It should be emphasized that we consider here simultaneous changes in tariffs and exchange rates that continuously maintain balance of payments equilibrium. The monetary approach to the balance of payments will not be relevant in the present context, inasmuch as no change occurs in the country's foreign exchange reserves and, hence, in the supply of money. Also, in the event of compensating changes in tariffs and exchange rates, one may neglect changes in the price level that would affect the real value of money holdings.[34]

It will be recalled that, for trade transactions, a devaluation may be interpreted as the parallel imposition of import tariffs and export subsidies at equal rates. A move to free trade can then be seen as replacing the existing protective measures with a uniform rate of tariff and subsidy that will maintain the balance of trade unchanged. This "uniform tariff-subsidy equivalent" represents an extension of Corden's concept of "uniform tariff equivalent," which has been defined as the uniform rate of tariff that will maintain imports at the same level as the existing set of tariffs and other protective measures.[35]

The concept of the net effective rate of protection has been designed to indicate the incentives provided by the system of protection to a processing activity, both directly, through the effects of protective measures on the prices of output and products used as inputs, and indirectly, through its effects on the exchange rate. Net effective rates above (below) zero will then indicate that a processing activity is favored (disfavored) by the system of protection compared with the free-trade situation, and gains (or losses) resources as a result.

In the economies under study, the elimination of protective measures would necessitate a devaluation. Correspondingly, the calculation of net effective rates involves a downward adjustment in the effective protection rates estimated at the existing exchange rate. This adjustment reflects the fact that the appreciation of the exchange rate associated with the imposition of protective measures lowers the c.i.f. price of imports and the f.o.b. price of exports, thus reducing the protective effect of the tariff while discriminating against exports.

It should be emphasized that in estimating the hypothetical free trade exchange rate there is considerable scope for error. For one thing, there is limited information on demand and supply responses to changes in tariffs, export subsidies, and exchange rates. For another, as Dornbusch shows, the partial equilibrium estimation of the exchange rate is based on restrictive assumptions as to cross-price elasticities between traded goods, which are taken to be zero, and the marginal propensity to spend on nontraded goods, which is taken to be unity.[36]

Effects of Protection on Factor Prices

Thus far we have considered the effects of protection on product prices, to the exclusion of its effects on factor prices. Yet the incentives to a processing activity provided by the system of protection will depend not only on its effects on product prices but also on its effects on factor prices. Thus, it is conceivable that a processing activity with a lower effective rate of protection will receive greater incentives than an activity with a higher effective rate because of the differential effects of protection on the prices of the factors they use.

The question arises, then, whether the incidence of the system of protection on factor prices would in practice outweigh its incidence on product prices, which is measured by effective rates of protection. Under the assumption of constant input coefficients, the answer to this question will depend on interindustry differences in effective rates of protection and in factor intensities.

Other things being equal, the larger the dispersion of effective rates of protection and the smaller the interindustry differences in factor intensities, the more important will be the product-price—compared with the factor-price—effects of protection.[37] An empirical investigation of this question would require information on factor intensities that is not available for all the economies studied, but the large variations observed in effective rates of protection in developing countries suggest that product-price effects will tend to dominate factor-price effects. If effective rates of protection are 60 percent in industry *A* and 10 percent in industry *B*, for example, very large differences in factor intensities would be required for the factor-price effects of protection to reverse the product-price effects indicated by effective rates of protection.

This conclusion is supported by results obtained by Jaime de Melo, who has incorporated an earlier version of estimates reported for Colombia in Chapter 6 of this volume in a 15-sector general equilibrium model containing 11 traded goods sectors and 4 nontraded goods sectors. The model distinguishes among three primary factors—land, labor, and capital—and admits substitution among primary factors but assumes constant coefficients for intermediate inputs.

Taking first the case in which capital is immobile among industries, de Melo has concluded that "in practice factor-price effects are not likely to outweigh product-price effects."[38] He has also found that effective rates of protection estimated in a general equilibrium framework predict the resource flows caused by the imposition of protective measures better than do nominal rates.[39]

Similar results have been reached under the assumption that capital is mobile among industries. According to de Melo, "The reader can verify that there are again a few instances where relative price changes [that is, nominal rates of protection] do not correctly predict output responses but that relative net price changes [that is, effective protection rates estimated in a general equilibrium framework] are a good indicator of resource pulls for traded goods."[40] In fact, there is not a single traded goods sector where factor-price effects would outweigh product-price effects.[41]

Partial Equilibrium Effective Rates and Resource Flows

De Melo's results have been obtained using effective rates of protection estimated in a general equilibrium framework. The question remains how well effective rates of protection estimated in a partial equilibrium framework will predict the effects of protection on resource flows. Although this question has been investigated in a number of theoretical articles,[42] there have been only two noteworthy empirical studies.

Under the assumption of constant intermediate input coefficients, Taylor and Black have compared output changes predicted by partial equilibrium effective protection rates with output changes estimated in a 35-sector general equilibrium model.[43] If intermediate input coefficients are assumed to be constant, the rank correlation coefficient between the two sets of estimates is 0.885. If, instead, a unitary substitution elasticity between primary factors and intermediate inputs is assumed, there are larger absolute differences between the two sets of estimates but the rank correlation coefficient between them remains high (0.851).

The Taylor-Black model assumes that capital is immobile among industries, but this assumption conflicts with the long-run character of the theory underlying the measurement of protection. The sensitivity of the results to this assumption has been investigated by de Melo. Depending on whether capital was assumed to be immobile or mobile, he obtained rank correlation coefficients of 0.800 and 0.864 between partial equilibrium effective rates and resource flows described in a general equilibrium framework. The comparable results are 0.764 and 0.845 if nominal rates of protection, and 0.950 and 0.955 if general equilibrium effective rates are correlated with resource flows.[44]

These results have subsequently been revised by dividing labor into two groups, skilled and unskilled, with calculations made for 11 as well as for 22 traded goods sectors. Depending on whether capital was assumed immobile or mobile, the rank correlation coefficients between partial equilibrium effective rates and resource flows are 0.864 and 0.891 for 11 sectors, and 0.978 and 0.997 for 22 sectors.[45] The closer correspondence between partial equilibrium effective rates and resource flows in the 22-sector model may be explained if we consider that with greater disaggregation the variance of effective rates will be higher, thus reducing the probability that factor-price effects will outweigh product-price effects.

It appears, then, that although the lack of consideration of factor-price effects and input-substitution possibilities introduces errors in the estimation of effective rates of protection in a partial equilibrium framework, the estimated effective rates may be used to provide an indication of the incidence of protection and its effects on resource allocation. And while the general equilibrium results cited assume that the production function is separable, this assumption may not be crucial to the accuracy of the results.

Effective Rates of Subsidy and Cash Flow Measure

As noted, the free-trade situation serves as a norm in quantifying the incidence of protective measures. Quantifying the incidence of credit and tax preferences, too, necessitates selecting an appropriate norm to represent neutrality. This choice will be considered first with regard to credit preferences and next for tax preferences.

Credit Preferences

Credit preferences may be provided in the form of loans at preferential interest rates to particular industries, to domestic and export sales, or to investment in selected regions.[46] Governments may also establish interest ceilings for bank loans and may interfere with the allocation of credit. In the event that interest rate ceilings apply and credit is rationed, unofficial (black, grey, or curb) credit markets may develop in which interest rates are higher.

In quantifying the incidence of credit preferences, one may choose as the norm the interest rate that obtains in the absence of government intervention in credit markets. In the study on Israel such a norm has been derived for short-term as well as for long-term credit, reflecting

the fact that the influences determining the equilibrium rate of interest differ in the two cases.

These results for Israel were obtained in the course of a detailed study of credit markets and credit allocation. In the present investigation, similar studies could not be attempted for the other five economies covered. In these cases, the average interest rate paid has been taken as the norm, and deviations from this rate have been taken to reflect positive or negative credit preferences. For comparability, such a calculation has also been used in the case of Israel.

Tax Preferences

A nondiscriminatory tax system would involve the use of a value added tax at uniform rates. Such a tax has not been taken as the norm in calculating the extent of tax preferences in the present investigation. This is because the calculation would have required a general equilibrium analysis of all types of taxes, which is subject to considerable practical difficulties and transcends the scope of the present investigation. We will therefore consider the various taxes one by one.

Taxes on unincorporated enterprises apart, personal income taxes have been excluded from our purview. These taxes do not generally discriminate among productive activities, but rather serve the twin objectives of raising government revenue and of correcting the income distribution generated by the working of product and factor markets.

In turn, one would need to separate the capital and the wage tax components of personal income taxes paid by unincorporated enterprises. This is because such enterprises may bear taxes at different rates from those of the corporate sector, and the relative proportions of the two forms of enterprises differ among industries, so that the average tax rate on profits will vary from industry to industry. In most developing countries, such differences are likely to favor agriculture at the expense of manufacturing.

Tax rates on corporate income, too, may vary among industries as well as between export- and import-competing activities. This result may be due to variations among productive activities in statutory tax rates, tax exemptions and credits, and provisions for depreciation and for carrying forward losses. Relative incentives may also be influenced by the provision of lower tax rates for small businesses, depending on how small businesses are distributed among industries.

In estimating the incidence of taxes on capital, the average tax on the profits of unincorporated and corporate enterprises has been taken as the norm. This choice reflects the assumption that pretax profits will not be affected if tax rates are varied.

Social security taxes paid by firms will not create discrimination among productive activities as long as they are matched by social benefits that workers consider to be part of their income. In such an event, taxes paid by firms determine the share of wages in labor costs without affecting their total. In turn, social benefits financed from general taxes will represent a subsidy to labor use, and thus will benefit labor-intensive industries. Subsidies through the financing of social benefits from general taxes and differences in perceived social benefits and their cost to the firms have not been considered in the present investigation, however, on the grounds that they reflect social values that are taken as given.

Tax preferences have thus been estimated only with respect to taxes on profits of corporations and unincorporated enterprises. In the case of Israel, a further adjustment has been made for investment grants provided to certain activities. In the case of Taiwan, account has been taken of tax subsidies to exports.

Effective Rates of Subsidy

In the final analysis, then, credit and tax preferences have been expressed in terms of deviations from average rates. Correspondingly, the value of these preferences to a particular activity has been estimated as the absolute difference between the hypothetical interest charges and taxes payable at average rates and the amounts actually paid. Deviations from the overall averages have also been calculated in the case of investment grants, and export subsidy measures that have been considered in conjunction with tax preferences.

The (positive and negative) value of credit and tax preferences for a particular activity has been added to domestic value added in estimating the effective subsidy measure, which is designed to indicate the combined incidence of protective measures and credit and tax preferences. The effective rate of subsidy has been defined as the percentage excess of adjusted domestic value added over world market value added.

The weighted average of effective subsidy rates for all sectors equals that of effective protection rates, the weights being world market value added. This conclusion follows since the average rates of credit and tax preferences have been chosen as the norms from which deviations have been calculated for estimating effective subsidy rates for individual activities.

Cash Flow Measure

Several writers have considered the implications of removing the assumption of fixed factor supplies that underlies the estimation of effective rates of protection

and subsidy. Basevi has calculated effective rates of protection under the assumption that capital is mobile internationally and therefore can be considered together with traded inputs.[47] Schydlowsky has proposed the concept of effective protection of profits.[48] The cash flow measure, which relates the incentive effects of protection to cash flow by grouping labor inputs together with traded inputs, represents an application of the effective protection of profits concept.

Since cash flow is a residual—the value of output less costs other than depreciation—it is sensitive to relatively small variations in output and input prices, as well as in input-output coefficients, and the results will be affected to a considerable extent by conditions prevailing in the year for which the calculations have been made. Further possibilities for error arise from the difficulties of separating cash flow from wages in unincorporated enterprises; these difficulties are of particular importance in the agricultural sector of developing countries. Moreover, calculating effective protection and subsidy rates with respect to cash flow requires the additional assumption that labor input coefficients are constant.

The volatile nature of the cash flow measure, the difficulties involved in separating cash flow and wages in unincorporated enterprises, and the error possibilities owing to factor substitution reduce its practical usefulness. With the possible exception of Colombia, in the economies under study the assumption of an infinitely elastic labor supply cannot be made for unskilled labor, nor is this assumption applicable to any of the six economies with regard to semiskilled, skilled, technical, and managerial labor.

On the basis of these considerations, the cash flow measure has not been estimated in all the case studies, and a comparative analysis of the results obtained by the measure is not provided. Only for Argentina and Colombia has this measure been used.

Conclusion

We described in this chapter the incentive measures that affect the allocation of resources and international trade in developing countries, including tariff-type and quantitative measures of protection as well as credit and tax preferences. We further examined problems relating to the quantification of these measures, with a view to estimating indicators of incentives, such as the nominal and the effective rates of protection, the effective rate of subsidy, and the cash flow measure.

Next, we considered the conceptual and empirical problems in estimating effective rates of protection. These problems relate chiefly to substitution among inputs and the effects of the imposition of protective measures on the exchange rate and on the prices of primary factors and nontraded goods. Apart from adjusting for the difference between the existing exchange rate and the rate that would obtain under free-trade conditions and for the impact of protection on the prices of nontraded inputs in a partial equilibrium framework, it has not been possible to allow for these considerations in the present investigation. From available evidence, however, it appears that the errors committed thereby may not compromise the usefulness of effective rates of protection for indicating the structure of incentives and the resulting resource flows.

The conclusions regarding the effects of protection on resource flows apply under the assumption of pure competition, where only "normal" profits are made. Under monopolistic and oligopolistic market structures, protection not only permits the establishment of processing activities that would not survive under free trade, but also gives rise to excess profits. The estimation of excess profits would, however, require information on the capital stock in individual industries that was not available in the industrial breakdown used in the case studies. Thus, it has not been possible to indicate the extent to which effective rates influence the allocation of resources or give rise to excess profits under noncompetitive market structures.

Notes to Chapter 1

(The word "processed" describes works that are reproduced from typescript by mimeograph, xerography, or similar means; such works may not be cataloged or commonly available through libraries, or may be subject to restricted circulation.)

1. V. Joshi, "The Rationale and Relevance of the Little-Mirrlees Criterion," *Bulletin of the Oxford University Institute of Economics and Statistics*, vol. 34 (February 1972), pp. 3–32.
2. Possible outcomes are considered under alternative assumptions in J. A. P. de Melo and S. Robinson, "Tradability in Trade Theory" (Washington, D.C.: World Bank, 1978; processed).
3. J. Bhagwati, "On the Equivalence of Tariffs and Quotas," in *Trade, Growth and the Balance of Payments: Essays in Honor of Gottfried Haberler*, ed. R. E. Baldwin and others (Amsterdam: North-Holland, 1965).
4. See G. Fishelson and F. Flatters, "The (Non-) Equivalence of Optimal Tariffs and Quotas under Uncertainty," *Journal of International Economics*, vol. 5 (November 1975), pp. 385–93; and M. Pelcovits, "Quotas versus Tariffs," *Journal of International Economics*, no. 6 (November 1976), pp. 363–70.
5. R. McCulloch and H. G. Johnson, "A Note on Proportionally Distributed Quotas," *American Economic Review*, vol. 63 (September 1973), pp. 726–32.
6. A. O. Krueger, "The Political Economy of the Rent-Seeking Society," *American Economic Review*, vol. 64 (June 1974), pp. 291–304.

7. J. Bhagwati, *Foreign Trade Regimes and Economic Development: Anatomy and Consequences of Exchange Control Regimes* (Cambridge, Mass.: Ballinger Publishing Co., 1978), p. 12.

8. Ibid., chap. 2.

9. It is not our purpose here to discuss the methods or the difficulties of making price comparisons. For a detailed discussion, the reader is referred to S. Guisinger and D. Papageorgiou, "The Selection of Appropriate Border Prices in Project Evaluation," *Oxford Bulletin of Economics and Statistics*, vol. 38 (May 1976), pp. 79–98.

10. B. Balassa, "Tariff Protection in Industrial Countries: An Evaluation," *Journal of Political Economy*, vol. 73 (December 1965), pp. 573–94; W. M. Corden, "The Structure of a Tariff System and the Effective Protection Rate," *Journal of Political Economy*, vol. 74 (June 1966), pp. 221–37; and H. G. Johnson, "The Theory of Tariff Structure with Special Reference to World Trade and Development," *Trade and Development* (Geneva: Graduate Institute of International Studies, 1965).

11. See W. M. Corden, "Effective Protective Rates in the General Equilibrium Model: A Geometric Note," *Oxford Economic Papers*, vol. 21 (July 1969), pp. 135–41; and J. C. Leith, "Substitution and Supply Elasticities in Calculating the Effective Protective Rate," *Quarterly Journal of Economics*, vol. 82 (November 1968), pp. 528–601.

12. This interpretation has been adopted by J. Bhagwati and T. N. Srinivasan, "The General Equilibrium Theory of Effective Protection and Resource Allocation," *Journal of International Economics*, vol. 3 (August 1973), pp.259–81. Other writers have considered the use of the effective protection concept to predict changes in gross output (see W. M. Corden, "The Structure of a Tariff System and the Effective Protection Rate"), or in real value added (see W. W. Chang, "Intermediate Products, Aggregation, and Economic Growth," *Southern Economic Journal*, vol. 40 [July 1973], pp. 56–65).

13. Bhagwati and Srinivasan, "General Equilibrium Theory of Effective Protection and Resource Allocation," provide proof of this proposition for the case when all intermediate inputs are imported; the proof has subsequently been extended to the case where intermediate inputs are produced domestically, in the framework of a two-industry model. See K. Tanaka, Y. Sendo, and S. Kakimoto, "The Theory of Effective Protection in General Equilibrium with Inter-industrial Flows," *Journal of International Economics*, vol. 7 (November 1977), pp. 343–48.

14. See Leith, "Substitution and Supply Elasticities in Calculating the Effective Protective Rate."

15. See J. M. Finger, "Substitution and the Effective Rate of Protection." *Journal of Political Economy*, vol. 77 (November-December 1969), pp. 972–75.

16. See Corden, "Effective Protective Rates in the General Equilibrium Model: A Geometric Note"; and A. H. H. Tan, "Differential Tariffs, Negative Value Added and the Theory of Effective Protection," *American Economic Review*, vol. 60 (March 1970), pp. 107–16.

17. D. B. Humphrey and T. Tsukahara, "On Substitution and the Effective Rate of Protection," *International Economic Review*, vol. 11 (October 1970), pp. 488–96. All the rank correlation coefficients cited in this chapter are Spearman coefficients.

18. F. Witthans, "Estimates of Effective Protection Rates for U. S. Industries in 1967," *Review of Economics and Statistics*, vol. 55 (August 1973), pp. 362–64.

19. See G. P. Sampson, "Estimates of Effective Rates of Protection for United States Industries in 1967: A Comment," *Review of Economics and Statistics*, vol. 57 (August 1975), pp. 356–57.

20. T. Watanabe, "A Test of the Constancy of Input-Output Coefficients among Countries," *International Economic Review*, vol. 2 (September 1961), pp. 340–50.

21. D. B. Humphrey, "Substitution of Value Added for Intermediate Inputs: Empirical Estimate and Implications for Effective Protection" (Tulane University, 1972; processed), p. 8.

22. Bhagwati and Srinivasan, "General Equilibrium Theory of Effective Protection and Resource Allocation," p. 278.

23. Bhagwati and Srinivasan (ibid., pp. 270–74) show that the effective protection concept can be used to predict resource shifts, even if the production function is not separable, as long as changes in protection rates are small and we limit ourselves to the case of two industries.

24. Different results have been reached by Burgess in estimating an aggregate production function for the U.S. economy. These results may, however, reflect intersectoral differences in production functions. Moreover, as the author notes, "interest is not sectoral but factoral protection." D. F. Burgess, "Tariffs and Income Distribution: Some Empirical Evidence for the United States," *Journal of Political Economy*, vol. 84 (February 1976), pp. 17–46.

25. B. Balassa and Associates, *The Structure of Protection in Developing Countries* (Baltimore, Md.: Johns Hopkins University Press, 1971), p. 57.

26. In this connection, reference may be made to the conclusion reached by Corden in regard to the results obtained by V. K. Ramaswami and T. N. Srinivasan in "Tariff Structure and Resource Allocation in the Presence of Factor Substitution," in *Trade, Balance of Payments and Growth: Papers in International Economics in Honor of Charles P. Kindleberger* (Amsterdam: North-Holland, 1971): "To obtain paradoxical results for given factor intensities the biases must be of particular form and sufficiently large. Furthermore, input tariffs must be sufficiently high or changes in them significant." W. M. Corden, *The Theory of Protection* (Oxford: Clarendon Press, 1971), p. 151.

27. S. Guisinger and D. Schydlowsky, "A Note on the Effective Rate of Protection and the Period of Production," Discussion Paper no. 152 (Cambridge, Mass.: Harvard University Institute of Economic Research, 1970; processed), p. 10.

28. Balassa and Associates, *Structure of Protection in Developing Countries*, p. 22.

29. See A. J. Yeats, "A Sensitivity Analysis of the Effective Protection Estimates," *Journal of Development Economics*, vol. 3 (December 1976), pp. 367–76.

30. Alok Ray, "Non-traded Inputs and Effective Protection: A General Equilibrium Analysis," *Journal of International Economics*, vol. 3 (August 1973), pp. 245–57. Ray uses the expression "Balassa measure" to refer to an alternative measure employed by the author some years earlier, in "Tariff Protection in Industrial Countries: An Evaluation."

31. Ray, "Non-traded Inputs and Effective Protection," p. 256; Balassa and Associates, *Structure of Protection in Developing Countries*, pp. 321–22; and J. Tinbergen, "Projections of Economic Data in Development Planning," in *Planning for Economic Development in the Caribbean* (Puerto Rico: Caribbean Organization, 1963).

32. As Dornbusch notes, "the requisite adjustment is one of relative prices and . . . it is altogether immaterial whether such an adjustment comes via a change in the nominal price of home (nontraded) goods at constant traded goods prices or via a change in the nominal prices of traded goods at constant nominal prices of home goods." R. Dornbusch, "Tariffs and

Nontraded Goods," *Journal of International Economics*, vol. 4 (May 1972), p. 181. Since under the Balassa measure the net price (value added) of nontraded goods has been assumed constant in estimating the incidence of protective measures on the prices of traded goods, the same assumption can be made in examining how these prices are affected by the elimination of protective measures. Correspondingly, in the present investigation we have considered the exchange rate to be variable, with the net prices of nontraded goods remaining constant.

33. See H. G. Johnson, "A Model of Protection and the Exchange Rate," *Review of Economic Studies*, vol. 33 (April 1966), pp. 159–63. Johnson has shown that protection may lead to a depreciation rather than an appreciation of the equilibrium exchange rate if tariffs on inputs exceed tariffs on output. In the economies studied, however, the opposite conclusion is applied. The special case considered by Hindley, in which the imposition of tariffs leads to a depreciation of the exchange rate, is predicated on the assumption that money wages are inflexible downward as well as upward. See B. Hindley, "The Exchange Rate and Protection," *Journal of International Economics*, vol. 4 (May 1974), pp. 151–61.

34. On the application of the monetary approach to the case of the imposition of tariffs unaccompanied by exchange rate changes, see Michael Mussa, "A Monetary Approach to Balance-of-Payments Analysis," *Journal of Money, Credit, and Banking*, vol. 6 (August 1974), pp. 33–52.

35. Corden, *Theory of Protection*, p. 235.

36. Dornbusch, "Tariffs and Nontraded Goods," p. 181.

37. This proposition is advanced for the case in which the number of products exceeds the number of factors by a large margin. It contrasts with the familiar result that, in a two-product two-factor model, protection will lead to larger changes in relative factor prices than in relative product prices.

38. J. A. P. de Melo, "Protection and Resource Allocation in a Walrasian Trade Model," *International Economic Review*, vol. 19 (1978), pp. 25–44.

39. In the present case, resource flows may be taken as synonymous with output changes, which are measured in de Melo's model.

40. de Melo, "Protection and Resource Allocation in a Walrasian Trade Model," p. 33.

41. This is not the case for several nontraded goods sectors, but it has not been claimed that effective protection calculations would predict resource flows for such sectors.

42. For example, see Bhagwati and Srinivasan, "General Equilibrium Theory of Effective Protection and Resource Allocation"; Y. Sendo, "The Theory of Effective Protection in General Equilibrium," *Journal of International Economics* (May 1974), pp. 213–16; and Wilfred Ethier, "The Theory of Effective Protection in General Equilibrium: Effective-Rate Analogues of Nominal Rates," *Canadian Journal of Economics* (May 1977), pp. 233–45.

43. L. Taylor and S. L. Black, "Practical General Equilibrium Estimation of Resource Pulls under Trade Liberalization," *Journal of International Economics*, vol. 4 (April 1974), pp. 37–58.

44. de Melo, "Protection and Resource Allocation in a Walrasian Trade Model," p. 42.

45. J. A. P. de Melo, "Tariffs and Resource Allocation in Partial and General Equilibrium," *Weltwirtschaftliches Archiv*, vol. 116 (1980), pp. 114–30. For only one of the twenty-two sectors did net effective rates give incorrect predictions of whether the sector would gain or lose resources under protection.

46. While regional incentives fall outside the scope of the present investigation, regional credit allocation will, nevertheless, be relevant to the extent that there are interregional differences in industrial composition.

47. G. Basevi, "The U.S. Tariff Structures: Estimates of Effective Rates of Protection of U.S. Industries and Industrial Labor," *Review of Economics and Statistics*, vol. 48 (May 1966), pp. 147–60.

48. D. Schydlowsky, "Effective Rates of Protection and Allocation of Resources in a Competitive Economy" (Cambridge, Mass.: Harvard University, 1967; processed).

2

The Structure of Incentives in Six Semi-industrial Economies

BELA BALASSA

This chapter provides estimates of the various indicators that are used to characterize the systems of incentives in the six semi-industrial economies covered in Part II, including rates of nominal protection, effective protection, and effective subsidy. The effects of the systems of incentives on resource allocation, trade, and economic growth will be considered in Chapter 3.

This chapter begins with a description of the frequency distribution of the various indicators of incentives in the six economies, followed by an analysis of their statistical relationships by means of rank correlation coefficients. The relation of incentives to sales in export and in domestic markets is further examined.

In the case studies, indicators of incentives have been estimated for individual years in the late 1960s according to the sectoral breakdown of national input-output tables. To evaluate the structure of incentives in the six economies on a comparable basis, these estimates have been made for ten industry groups, defined according to the degree of fabrication and the final uses of the products. The results are presented in the section "The Interindustry Pattern of Incentives," where relative incentives to traditional and nontraditional primary exports and manufacturing activities are also discussed. In addition, attention is given to the pattern of "escalation" of protection from products at lower levels of fabrication to those at higher levels.

The third section compares incentives to export with incentives to sales in domestic markets, and provides estimates for export industries, export-and-import-competing industries, import-competing industries, and non-import-competing industries. For each of these trade categories, which were defined in Chapter 1, the incentives to primary and to manufacturing activities are shown separately. Finally, the estimates of protection are adjusted to compensate for the fact that under protection the exchange rate is lower (in domestic currency units per unit of foreign currency) than it would be under free trade. The resulting estimates indicate the net incentives provided to various activities compared with the neutral state of affairs characterized by free trade and the absence of credit and tax incentives.

Statistical Analysis of the Indicators of Incentives

The Frequency Distribution of the Estimates

The frequency distribution of nominal protection, effective protection, and effective subsidy rates, estimated according to the sectoral breakdown in national input-output tables, is shown in Table 2.1. For each sector, estimates have been made for sales in export and in domestic markets and then have been averaged to derive the rates of protection and subsidy on total sales. The average rate of nominal protection of a sector's total sales has been derived by weighting nominal rates estimated for export and for domestic sales by sales in the two markets, valued at world market prices; average rates of effective protection and subsidy have been obtained by weighting by value added, at world market

Table 2.1. *Six Semi-industrial Economies: Frequency Distributions of Indicators of Incentives*
(number of sectors)

	Nominal Protection			Effective Protection			Effective Subsidy		
Percentage Rates	E	D	A	E	D	A	E	D	A
Argentina, 1969									
- ∞ to -100.01	-	-	-	11	4	4	10	4	4
100.01 to + ∞	-	10	9	2	36	33	2	36	33
50.01 to 100.00	-	45	41	2	13	13	1	12	13
20.01 to 50.00	2	11	15	1	12	14	9	13	14
0.01 to 20.00	60	7	7	14	6	7	22	5	7
0	8	4	3	-	-	-	-	-	-
-0.01 to -50.00	12	5	7	41	11	11	31	12	11
-50.01 to -100.00	-	-	-	11	-	-	7	-	-
Total	82	82	82	82	82	82	82	82	82
Colombia, 1969									
- ∞ to -100.01	-	-	-	8	1	1	6	-	-
100.01 to + ∞	-	10	9	3	10	7	5	8	6
50.01 to 100.00	-	16	14	3	11	12	5	9	8
20.01 to 50.00	-	30	33	14	27	26	33	23	26
0.01 to 20.00	93	33	37	31	30	39	23	31	37
0	2	9	5	1	4	2	1	2	1
-0.01 to -50.00	-	4	4	27	12	8	17	21	16
-50.01 to -100.00	1	1	1	9	1	1	6	2	2
Total	96	103	103	96	96	96	96	96	96
Israel, 1968									
- ∞ to -100.01	-	-	-	2	2	2	2	2	2
100.01 to + ∞	-	2	1	3	36	33	3	36	32
50.01 to 100.00	1	28	26	5	16	17	5	14	17
20.01 to 50.00	6	30	32	7	11	13	9	15	15
0.01 to 20.00	22	13	15	12	7	7	9	6	8
0	42	8	7	46	4	4	46	2	1
-0.01 to -50.00	-	-	-	6	5	5	7	6	6
-50.01 to -100.00	-	-	-	-	-	-	-	-	-
Total	71	81	81	81	81	81	81	81	81
Korea, 1968									
- ∞ to -100.01	-	-	-	1	6	6	2	7	6
100.01 to + ∞	-	3	2	-	24	24	4	23	22
50.01 to 100.00	-	16	15	2	12	11	9	11	11
20.01 to 50.00	-	35	34	3	12	10	17	11	12
0.01 to 20.00	-	58	61	26	24	29	62	26	30
0	149	34	34	-	-	-	1	1	-
-0.01 to -50.00	1	3	4	117	67	67	52	63	65
-50.01 to -100.00	-	1	-	1	5	3	3	8	4
Total	150	150	150	150	150	150	150	150	150
Singapore, 1967									
- ∞ to -100.01	-	-	-	-	-	-	-	-	-
100.01 to + ∞	-	-	-	-	4	4	-	4	4
50.01 to 100.00	-	-	-	-	3	3	-	3	2
20.01 to 50.00	-	8	6	-	12	5	-	10	7
0.01 to 20.00	-	26	28	-	10	17	12	10	14
0	70	36	36	70	2	2	9	9	9
-0.01 to -50.00	-	-	-	-	38	39	39	32	34
-50.01 to -100.00	-	-	-	-	1	-	-	2	-
Total	70	70	70	70	70	70	60	70	70
Taiwan, 1969									
- ∞ to -100.01	-	-	-	1	6	6	-	6	6
100.01 to + ∞	-	1	-	-	11	7	3	11	7
50.01 to 100.00	-	4	3	1	6	6	7	5	6
20.01 to 50.00	-	20	16	-	5	7	10	5	11
0.01 to 20.00	-	18	24	3	5	8	33	6	5
0	61	18	18	33	-	-	-	-	-
-0.01 to -50.00	-	-	-	52	27	27	5	27	26
-50.01 to -100.00	-	-	-	1	1	-	3	1	-
Total	61	61	61	91	61	61	61	61	61

prices, in production for export and for domestic markets.

Nominal Rates of Protection

In the years under study, Argentina and Colombia levied taxes on traditional exports and subsidized exports of manufactures and exports of nontraditional primary products and manufactured goods, respectively. Israel subsidized most of its exports; ginseng was subject to export taxes in Korea, while in the other two economies no export subsidies or taxes were applied.

The range of nominal protection on domestic sales was the smallest in Singapore, where rates varied between 0 and 30 percent. Nominal rates of protection on domestic sales exceeded 100 percent in ten sectors in both Argentina and Colombia, while there were few such cases elsewhere. Average nominal rates of protection on total (domestic and export) sales were similar to those on domestic sales alone.

Effective Rates of Protection

Effective rates of protection varied much more widely than nominal rates. This variation is partly a reflection of differences among sectors in regard to nominal rates of protection on output and on tradeable inputs, and is partly due to intersectoral differences in the shares of value added and tradeable inputs.

If a sector receives no nominal protection on its exports while using tradeable inputs that are subject to tariffs or quantitative restrictions, the effective rate of protection on its export sales will be negative. More generally, the effective rate of protection will be negative and will represent discrimination against the sector at the existing exchange rate, whenever the weighted average of nominal protection rates on its tradeable inputs exceeds that on its output. Several sectors in each of the six economies faced negative rates of effective protection on exports and on domestic sales.

At the other extreme, effective protection is the highest in sectors where value added in world market prices is negative, as is the case if the world market value of tradeable inputs exceeds that of the sector's output. Effective protection rates then range from -100 percent to $-\infty$. Among the economies under study, effective rates of protection on exports and on domestic sales were between -100 and $-\infty$ for 11 and 4 sectors respectively in Argentina, for 1 and 6 sectors in Korea, and for 1 and 6 sectors in Taiwan; there were no such cases in Singapore.

Negative value added at world market prices may indicate that protection is making profitable the production of a commodity for which the country's resource endowment is not suitable.[1] It may also reflect the waste of materials, a lack of full capacity utilization, or the substitution of materials with higher world market prices for materials with lower prices in response to price distortions associated with protection. World market value added may also be negative if transport costs on imported parts, components, and accessories are higher than those on the assembled product, or if such inputs are overpriced. Finally, subsidization may permit the output to be exported at prices that do not cover the cost of tradeable inputs, expressed in world market prices.[2]

Value added may also appear to be negative at world market prices as a result of statistical error, arising particularly in comparisons between the domestic and the world market prices of the output and of tradeable inputs. In this connection, it should be borne in mind that world market value added is derived as a residual by deflating the value of output and that of tradeable inputs, measured in domestic prices, by the nominal rate of protection on each.

Estimates of high effective rates of protection, too, may reflect errors of observation, since in such cases the derived world market value added is small and effective rates vary greatly with nominal rates of protection on the output and on tradeable inputs. Nevertheless, the existence of a large number of high effective protection rates provides evidence of the height of protection and the unevenness of the protective structure.

Among the economies under study, effective rates of protection on domestic sales exceeded 100 percent in 36 sectors in Argentina, 10 sectors in Colombia, 36 sectors in Israel, 24 sectors in Korea, 4 sectors in Singapore, and 11 sectors in Taiwan, so that value added at domestic prices was at least double what it would have been at world prices. Such rates also applied to export sales in 2 sectors in Argentina, 3 sectors in Colombia, and 3 sectors in Israel. There were no such instances for export sales in Korea, Singapore, and Taiwan.

Effective Rates of Subsidy

The frequency distribution of the estimated effective rates of subsidy differs little from that of the effective rates of protection.[3] At the same time, in Korea, Singapore, and Taiwan there was much less intersectoral variation in effective protection and subsidy rates on sales in export markets than on sales in domestic markets. The opposite was the case in Argentina and Colombia (see Table 2.1).

These results are explained by differences in the systems of incentives among the economies studied. As discussed in detail in Chapter 3, exporters in the three Far Eastern economies enjoyed a free-trade regime, with some additional subsidies. Inputs for export production

were also imported duty free in Israel, but export subsidy rates varied among industries. In Argentina and in Colombia, the exporter did not have a free choice between imported and domestic inputs, the latter often being subject to high protection.

Relationships among the Indicators of Incentives

As an indicator of the effects of protective measures on economic activities, the effective protection measure is superior to the nominal protection measure since the former, but not the latter, takes account of the protection of inputs and relates protective measures to value added in the production process.

Cohen, however, has questioned how far findings on the structure of protection are affected if the structure is evaluated in terms of effective rather than nominal protection rates.[4] The extent of the similarity and dissimilarity of nominal and effective protection estimates may be indicated by calculating rank correlation coefficients between the two. This procedure is preferable to the use of ordinary (Pearson) correlation coefficients, since the latter cannot appropriately handle cases when world market value added is negative.

Sectors were ranked by effective rates of protection and subsidy in ascending order from −100 percent to +∞, and protection was taken to be the highest for sectors whose effective rates range between −100 percent and −∞. This group of sectors was ranked in descending order: that is, a rate of −200 percent was taken to provide greater protection than a rate of −1,000 percent. This method was chosen because it is analogous to benefit-cost analysis; it yields the inverse of a ranking by benefit-cost ratios when the benefits are measured by world market value added and the costs by value added in domestic prices.[5] The results are given in Table 2.2.

NOMINAL VERSUS EFFECTIVE PROTECTION. In the six economies under study, Spearman rank correlation coefficients between estimates of nominal and effective protection rates, calculated for total sales, range from 0.44 in Taiwan to 0.93 in Colombia. This compares with a range of 0.58 to 0.87 in the seven developing countries covered in *The Structure of Protection in Developing Countries*[6] and with a range of 0.06 to 0.96 in the twenty-six countries for which estimates were collected by Cohen, where rank correlation coefficients exceeded 0.80 in nineteen cases.

The coefficients vary less widely if we correlate nominal with effective rates of protection for domestic sales. Taiwan (0.64) and Singapore (0.73) are again at the lower end of the range, and Colombia (0.96) at the higher end. For export sales, the extent of correlation between estimates of nominal and effective protection is negligible in Argentina and in Colombia, and high in Israel; the statistical relation between the two sets of estimates is undefined for the Far Eastern economies, where rates of nominal protection on exports were zero (except for sales of ginseng in Korea by a government monopoly, which gave rise to an implicit export tax).

In interpreting these results, it should be borne in mind that a high rank correlation between nominal and effective rates of protection cannot be taken to indicate the ability of nominal rates to predict resource flows. A time-series investigation of data from South Africa has concluded that while nominal and effective rates are highly correlated, with a rank correlation coefficient of 0.92, "effective tariff rates appear to be significantly superior in predicting resource shifts."[7] Also, as shown in Chapter 1, in a general equilibrium framework, effective rates are better predictors of resource flows than are nominal rates.

NOMINAL PROTECTION VERSUS EFFECTIVE SUBSIDIES. The predictive power of nominal rates of protection decreases further if we introduce credit and tax preferences. Rank correlation coefficients are often much lower between rates of nominal protection and of effective subsidy than they are between rates of nominal and effective protection. The coefficients range between 0.09 (Israel) and 0.20 (Argentina and Colombia) for export sales; between 0.47 (Taiwan) and 0.88 (Colombia) for domestic sales; and between 0.72 (Singapore) and 0.91 (Taiwan) for total sales.

EFFECTIVE PROTECTION VERSUS EFFECTIVE SUBSIDIES. Introducing credit and tax preferences also introduces substantial differences in the ranking of sectors by effective protection and effective subsidy rates on export sales. This is especially the case for Israel, Korea, and Taiwan, where the rank correlation coefficients between effective rates of protection and of subsidy to exports do not exceed 0.15. For Singapore's exports, the statistical relationship is undefined: Effective rates of protection, although not effective rates of subsidy, are zero. In turn, the rank correlation coefficients are 0.84 for Argentina and 0.71 for Colombia.

For domestic sales, rank correlation coefficients between estimates of effective rates of protection and of subsidy vary between 0.89 for Colombia and 0.97 for Singapore. Similar results obtain for incentives to total sales, except in Taiwan where the rank correlation for total sales is considerably lower than for domestic sales.

INCENTIVES TO SALES IN EXPORT AND IN DOMESTIC MARKETS. Further interest attaches to the relationship of incentives to domestic and export sales. For the three countries where the relationship is defined (Argentina,

Table 2.2. *Six Semi-industrial Economies: Spearman Rank Correlation Coefficients between Indicators of Incentives*

	Argentina 1969	Colombia 1969	Israel 1968	Korea 1968	Singapore 1967	Taiwan 1969
Nominal vs. Effective Protection						
Export Sales	.171 (.063)	.117 (.129)	.938 (.001)	n.d.	n.d.	n.d.
Domestic Sales	.773 (.001)	.960 (.001)	.833 (.001)	.886 (.001)	.734 (.001)	.638 (.001)
Total Sales	.841 (.001)	.931 (.001)	.836 (.001)	.870 (.001)	.760 (.001)	.437 (.001)
Effective Protection vs. Effective Subsidies						
Export Sales	.836 (.001)	.712 (.001)	.143 (.102)	.155 (.029)	n.d.	.145 (.134)
Domestic Sales	.927 (.001)	.891 (.001)	.951 (.001)	.952 (.001)	.973 (.001)	.929 (.001)
Total Sales	.999 (.001)	.898 (.001)	.946 (.001)	.958 (.001)	.956 (.001)	.652 (.001)
Nominal Protection vs. Effective Subsidies						
Export Sales	.203 (.034)	.201 (.026)	.089 (.215)	n.d.	n.d.	n.d.
Domestic Sales	.816 (.001)	.881 (.001)	.785 (.001)	.813 (.001)	.713 (.001)	.467 (.001)
Total Sales	.835 (.001)	.838 (.001)	.780 (.001)	.799 (.001)	.719 (.001)	.909 (.001)
Incentives to Exports vs. Domestic Sales						
Nominal Rate of Protection	.450 (.001)	.280 (.003)	.081 (.235)	n.d.	n.d.	n.d.
Effective Rate of Protection	.145 (.097)	-.503 (.001)	.114 (.156)	-.153 (.031)	n.d.	.143 (.129)
Effective Rate of Subsidy	.178 (.055)	-.453 (.001)	.074 (.257)	.194 (.009)	.358 (.002)	.319 (.007)

Note: The numbers in parentheses indicate the level of statistical significance. N.d. refers to the fact that the relationship is not defined because rates of protection on export sales are uniformly nil.

Colombia, and Israel), nominal rates of protection of export sales and of domestic sales are positively correlated; this positive correlation reflects the fact that an export tax or subsidy will affect prices in export as well as in domestic markets. In Israel, however, the rank correlation coefficient is not statistically significant at the 10 percent level.

The introduction of interindustry differences in input protection modifies the results to a considerable extent. Effective rates of protection to exports and to domestic sales are negatively correlated in Colombia; the (positive) rank correlation coefficient is only 0.15 and is barely significant at the 10 percent level in Argentina; and the coefficient is not significant at the 10 percent level in Israel. Finally, the correlation is slightly negative in Korea and slightly positive in Taiwan; it is undefined for Singapore, where the effective rates of protection of exports were zero.

Taking account of credit and tax preferences modifies the results but little for Argentina, Colombia, and Israel. For the Far Eastern economies, the correlation between effective subsidy rates to exports and to domestic sales is positive but low.

IMPLICATIONS. These comparisons point to the usefulness of estimating effective rates of protection in appraising a country's incentive structure. The conclusion applies all the more to the estimation of effective subsidy rates.

Both the range and the distribution of estimates of protection change considerably if we substitute effective for nominal rates. Estimating effective rates also permits us to show the existence of discrimination against activities in which tradeable inputs receive higher nominal protection than the output and, at the other extreme, to identify activities in which value added is negative at world market prices. The practical usefulness of effective rates in characterizing the structure of protection thus complements their theoretical superiority over nominal rates.

The Interindustry Pattern of Incentives

Sectoral estimates of nominal and effective protection rates and effective subsidy rates have been averaged for groups of industries classified on the basis of the degree of fabrication and the final uses of the products. As noted in Chapter 1, in averaging nominal rates of protection, world market values of sales have been used as weights. Effective rates of protection and subsidy have been averaged by using world market value added as weights; this procedure ensures that the averages thereby obtained are identical to effective rates calculated directly from aggregated data.[8]

The Classification Scheme

The country studies reported in Part II of the volume use the system of ten industry groups established on the basis of the International Standard Industrial Classification (ISIC). These categories are: (I) agriculture, forestry, and fishing; (II) processed foods; (III) beverages (including tea, coffee, and cocoa as well as alcoholic beverages) and tobacco; (IV) mining and energy; (V) construction materials; (VIA) intermediate products at lower levels of fabrication; (VIB) intermediate products at higher levels of fabrication; (VII) nondurable consumer goods; (VIII) consumer durables; (IX) machinery; and (X) transport equipment. Industrial categories I and IV have been considered primary activities and the remainder, manufactured goods.

In the present chapter, this classification scheme has been modified to ensure the conformity with trade statistics that is necessary for evaluating the effects of the incentive system on trade in Chapter 3. Primary exports have been defined to include Sections 0 to 4 in the Standard International Trade Classification (SITC) plus diamonds and nonferrous metals from SITC Section 6. The remainder of Section 6 as well as Sections 5, 7, and 8 have been classified as manufactured exports. Correspondingly, primary activities here include agriculture, forestry, and fishing (I), mining and energy (IV), processed foods (II), tobacco and beverages (III), and diamonds and petroleum products from intermediate products (VIA).[9] In turn, industry categories V, VIA (other than diamonds and petroleum products), VIB, and VII to X have been classified as manufacturing activities.

Table 2.3 shows average nominal rates of protection, effective rates of protection, and effective rates of subsidy for total (domestic and export) sales according to this classification. For comparability, the results are also reported according to the definition of primary and manufacturing activities used for the case studies. The same weighting procedure has been used for the industry estimates in this table and for the estimates in Table 2.1.

Table 2.3 also distinguishes between traditional and nontraditional activities. A country's traditional exports are defined as those that accounted for at least 2 percent of its total exports in 1953. (The expressions "traditional exports" and "traditional products" will be used interchangeably throughout the discussion.) Except for diamonds in Israel, there are no manufactured goods in the traditional product category in any of the economies studied. Appendix Table 3.2 at the back of the book

Table 2.3. *Six Semi-industrial Economies: Incentives to Total Sales, by Industry Group*
(percent)

	Argentina, 1969			Colombia, 1969			Israel, 1968
	Nominal Protection	Effective Protection	Effective Subsidy	Nominal Protection	Effective Protection	Effective Subsidy	Nominal Protection
Agriculture (I)	-10	-13	-11	-12	-14	-12	23
Traditional	-10	-13	-11	-51	-51	-49	12
Nontraditional	-	-	-	2	2	4	27
Mining (IV)	30	32	32	-9	-10	-12	14
Traditional	-	-	-	-9	-10	-12	-
Nontraditional	30	32	32	-	-	-	14
Agriculture & Mining (I IV)	-6	-9	-8	-12	-14	-12	22
Processed Foods (II)	2	24	23	3	12	10	31
Traditional	-8	-18	-18	-	-	-	-
Nontraditional	7	33	32	3	12	10	31
Beverages & Tobacco (III)	50	87	86	23	24	20	33
Petroleum Products (ex VIA)	37	48	47	-10	8	7	-
Diamonds (ex VIA)	-	-	-	-	-	-	1
Primary Activities (I-IV + Petroleum Products, Diamonds)	3	0	2	-8	-10	-9	18
Traditional	-10	-13	-12	-45	-48	-47	4
Nontraditional	20	45	45	2	3	4	28
Construction Materials (V)	29	31	30	5	5	-1	13
Intermediate Products I (VIA other)	27	142	141	53	24	21	43
Intermediate Products II (VIB)	67	122	120	26	27	24	35
Nondurable Consumer Goods (VII)	56	48	48	37	45	42	61
Consumer Durables (VIII)	88	144	142	49	78	61	55
Machinery (IX)	87	117	116	33	40	22	18
Transport Equipment (X)	109	207	206	139	215	215	57
Manufacturing (VI, VIA other, VIB-X)	70	112	110	30	35	31	42
Manufacturing & Simple Processing (II, III, VI-X)	51	98	97	20	27	24	34
All Industries (I-X)	36	47	47	3	-2	-2	31
Traditional	-45	-13	-12	-10	-48	-48	4
Nontraditional	55	96	95	11	10	10	37

Note: Agriculture is defined to include forestry and fishing; mining comprises mining and energy. Petroleum products are regarded as traditional exports in Colombia while diamonds are regarded as traditional exports in Israel.

shows the values and volumes of traditional exports, their shares in the economies' total exports, and the economies' shares in the world exports of these commodities.

Incentives to Traditional and to Nontraditional Products

Argentina's traditional exports include fresh meat, canned and prepared meat, wheat, maize, other cereals, fresh fruits and nuts, animal feed, hides and skins, wool, and linseed oil. In the period studied, most of these products were subject to a 10 percent export tax and suffered additional discrimination from tariffs on their inputs, so that the effective rate of subsidy was −13 percent. On nontraditional products, by contrast, effective subsidy rates averaged 96 percent.

Colombia levied a tax of about 50 percent on coffee exports. Among its other traditional products, crude petroleum and petroleum products were sold at less than world market prices domestically while exports of petroleum products, though not of crude petroleum, were subsidized. Weighted by export and domestic sales, the average nominal protection rates on total sales were −9 percent for crude petroleum and −10 percent for petroleum products.

Colombian exporters of petroleum products, however, benefited from the low domestic price of their major input, crude petroleum, and enjoyed a 7 percent effective subsidy on their total sales. The effective subsidy rate on crude petroleum was −12 percent. Taken together, effective protection and subsidy rates in Colombia averaged −48 percent on traditional products and 10 percent on nontraditional products.

Israel, 1968		Korea, 1968			Singapore, 1967			Taiwan, 1969		
Effective Protection	Effective Subsidy	Nominal Protection	Effective Protection	Effective Subsidy	Nominal Protection	Effective Protection	Effective Subsidy	Nominal Protection	Effective Protection	Effective Subsidy
48	45	17	18	22	-	-	-	2	-4	-7
24	21	-35	-43	-41	-	-	-	0	-6	-9
62	59	17	18	22	-	-	-	2	-4	-6
18	27	7	3	5	-	-	-	0	-7	-10
-	-	0	-2	-3	-	-	-	-	-	-
18	27	8	3	5	-	-	-	0	-7	-10
45	43	16	17	21	-	-	-	2	-5	-7
151	149	3	-17	-23	3	3	3	8	1	7
-	-	-42	-67	-71	-	-	-	8	93	137
151	149	7	-7	-13	3	3	3	8	-10	-2
91	100	2	-19	-24	14	29	18	48	-6,471	-6,316
-	-	-25	-67	-70	0	0	14	23	61	60
0	2	-	-	-	-	-	-	-	-	-
48	47	10	9	11	3	9	12	6	0	-2
13	13	-34	-50	-52	-	-	-	2	-4	-6
71	71	11	10	13	3	9	12	7	1	-1
16	24	4	-11	-16	6	16	13	0	-10	-12
92	87	10	14	12	2	3	2	11	10	15
74	70	19	24	19	5	10	10	12	16	27
95	100	9	-9	-35	2	0	-4	10	8	9
104	110	31	51	31	7	10	10	14	29	38
15	24	28	43	31	5	6	6	9	1	0
188	181	54	164	159	1	-1	-3	27	55	53
76	76	16	13	8	3	4	2	12	14	13
71	72	11	-1	-7	3	6	6	13	19	23
62	62	13	10	10	3	6	6	9	5	5
13	13	-34	-50	-52	-	-	-	2	-3	-6
74	74	13	11	11	5	6	6	10	6	7

In all other countries, these products are classified as nontraditional.

Israel's traditional exports, citrus fruit and diamonds, received subsidies of 12 percent and 1 percent, respectively, compared with average subsidies of 37 percent on nontraditional exports. Effective subsidy rates were 21 percent on citrus fruit, 2 percent on diamonds, and 74 percent on nontraditional products.

Among Korea's traditional products, ginseng exports were subject to a tax, seaweed was sold at a lower price domestically than abroad, while raw silk and tungsten ore and concentrates were sold at the world market price at home as well as abroad. Except for raw silk, which is not shown separately in Korea's input-output statistics, the nominal rate of protection on the total sales of traditional products was −34 percent. Effective subsidy rates on traditional products averaged −52 percent compared with 11 percent on nontraditional products.

Exports of Taiwan's traditional products—rice, bananas, sugar, and tea—have lost importance with the rapid development of exports of processed fruits and vegetables and, in particular, manufactured goods. Taiwan's tea exports, though not subsidized, were protected by tariffs, which raised the average rate of nominal protection on the total sales of traditional products to 2 percent. The effective rate of subsidy on these products was −6 percent, however, because of tariffs levied on their inputs and their relatively unfavorable credit and tax treatment. Nontraditional products received an average effective rate of subsidy of 7 percent. There are no traditional exports in Singapore.

Incentives to Primary Production and to Manufacturing

The following discussion of relative incentives to primary production and manufacturing, which gives

attention to nontraditional products within the primary sector, will be limited to incentives to total sales. Incentives to sales in domestic and in export markets will be compared in the subsequent section.

In Argentina, nominal protection rates on manufacturing activities averaged 70 percent, compared with 3 percent in the primary sector. The difference is attenuated, but continues to be large, if we exclude traditional primary products from the comparison: the average nominal rate of protection on nontraditional primary exports was 20 percent.

The escalation of tariffs from lower to higher levels of fabrication raised the average effective subsidy rate for manufacturing in Argentina to 110 percent, as against 2 percent for traditional and nontraditional primary activities combined. Effective subsidy rates averaged 45 percent on nontraditional primary products, a category dominated by processed foods whose inputs were subject to low tariffs.

In Colombia, too, nominal protection rates were higher on manufactured goods (30 percent) than on nontraditional primary products (2 percent), with an average of −8 percent for all primary products. The discrimination against primary activities appears to have been even stronger if effective rates of subsidy are compared. These averaged 31 percent on manufactured goods, 4 percent on nontraditional primary products, and −9 percent on traditional and nontraditional primary products combined.

Israel's nominal rates of protection averaged 42 percent on manufactured goods, 28 percent on nontraditional primary products, and 18 percent on all primary commodities. Effective rates of subsidy were similar for manufacturing (76 percent) and nontraditional primary activities (71 percent), but the primary sector had an average effective subsidy rate of only 47 percent.

In Korea, average nominal rates of protection were somewhat higher on manufactured goods (16 percent) than on primary commodities (10 percent including, and 11 percent excluding, traditional products). The situation is reversed, however, if we consider effective rates of subsidy. The reversal reflects mainly the benefits primary producers received through lower income tax rates.

In Singapore, nominal rates of protection averaged 3 percent on manufactured goods as well as on primary products, all of which are considered nontraditional. Effective rates of subsidy averaged 2 percent on manufactured goods and 12 percent on primary products; the latter result is greatly affected by an effective subsidy of 18 percent on beverages and tobacco because of low input tariffs.

Taiwan's nominal protection rates averaged 12 percent on manufactured goods and 6 percent on primary products (7 percent if traditional exports are excluded). Manufacturing was also favored by the escalation of tariffs and by governmental preferences, so that effective subsidy rates averaged 13 percent on manufactured products as against −2 percent on primary goods (−1 percent excluding traditional exports). These results, however, overstate the bias against primary activities, since no estimates have been made of tax preferences that benefited agriculture in Taiwan, whereas such estimates were prepared for Korea.

The Pattern of Escalation

It has been observed that protection tends to escalate from lower to higher levels of transformation in both developed and developing countries.[10] Machinery, however, is an ambiguous case, as it is simultaneously a final product and an input into the production process. We next consider the escalation of effective subsidy rates in the economies under study.

In Argentina, effective subsidy rates were higher on manufactures than on primary products, but among manufacturing activities the traditional pattern of escalation was partly reversed. Intermediate products at lower and at higher levels of fabrication received average effective subsidy rates of 141 and 120 percent, respectively, while nondurable consumer goods received an effective subsidy of 48 percent. Effective subsidy rates averaged 142 percent on durable consumer goods and 206 percent on transport equipment.

Effective subsidy rates showed the traditional pattern of escalation in Colombia. They were highest on transport equipment (215 percent), followed by durable and nondurable consumer goods, and by intermediate products and machinery. Effective subsidy rates were 4 percent on agriculture other than coffee, and 10 percent on food processing.

The traditional pattern of escalation by and large obtained in Israel. Transport equipment had the highest rates of effective subsidy (181 percent), followed by durable and nondurable consumer goods, but effective subsidy rates were somewhat higher for intermediate products at lower levels of fabrication than they were for higher level intermediate products. Processed foods received an effective subsidy of 149 percent, much of which reflects the high protection of sugar.

Effective rates of subsidy also escalated within the manufacturing sector in Korea; the major exception was nondurable consumer goods, an efficient export industry that received an average effective subsidy of −15 percent. Among primary activities, effective subsidy rates averaged 22 percent in nontraditional agriculture and −23 percent in food processing. The latter result is greatly influenced by the high implicit tax on seaweed

processing, which has no agricultural inputs. Finally, effective subsidies were highest on transport equipment, at 159 percent, while the next highest effective rate, 31 percent, was on durable consumer goods and on machinery.

In Singapore, effective subsidy rates were highest on beverages and tobacco (18 percent) and on petroleum products (14 percent), where protection partly served the function of an excise tax. Within the manufacturing sector, effective subsidy rates did not escalate; they varied between 13 percent for construction materials and −4 percent for nondurable consumer goods.

Effective subsidy rates in Taiwan's manufacturing sector showed the traditional pattern of escalation, except in the case of nondurable consumer goods, for which effective subsidy rates averaged 9 percent; the rates ranged from −12 percent for construction materials to 53 percent for transport equipment. Effective subsidy rates were also negative on agricultural products (−7 percent) and on nontraditional processed foods (−2 percent), whereas value added in the production of beverages and tobacco was negative at world market prices.

The Trade Orientation of the Incentive System

Incentives to Sales in Domestic and in Export Markets

Table 2.4 compares the relative incentives to sales in domestic and in export markets for the ten industrial groups. Ratios above (or below) one indicate that incentives to sales in domestic markets are higher (or lower) than to sales in export markets. The ratios thus show whether the incentive system is biased against or in favor of exportation. They have been calculated by dividing rates of protection or subsidy on sales in domestic markets, plus one, by rates of protection or subsidy on sales in export markets, plus one. In the case of nominal protection, these ratios equal the ratios of domestic to export prices. In the case of effective rates of protection and subsidy, they equal the ratios of value added in domestic sales to value added in export sales, both expressed in domestic prices.[11] The following discussion is limited to the relative incentives measured by effective subsidy rates.

Argentina, Colombia, and Israel gave traditional primary products similar incentives for domestic and export sales. In Korea, exports of traditional primary products were favored over domestic sales, largely because the government seaweed monopoly charged higher prices for export than for domestic sales. In Taiwan, credit and tax preferences generally favored exports of primary products over domestic sales.

In Argentina and Israel, exports of nontraditional products were discriminated against in favor of domestic sales (the ratios are 2.97 and 1.38, respectively), while the opposite was true in Colombia (0.79). In the case of manufactured goods, the bias against exportation was most pronounced in Argentina, with a ratio of 2.92, followed by Israel (1.32) and Colombia (1.20). In both nontraditional primary products and manufactured goods, Korea, Singapore, and Taiwan gave sales in domestic and foreign markets roughly equal incentives.

Incentives for Trade Categories

Sectoral estimates of nominal and effective rates have also been aggregated into the four trade categories introduced in Chapter 1: export industries, export-and-import-competing industries, import-competing industries, and non-import-competing industries. The export industry category includes traditional and nontraditional products; the other three trade categories comprise nontraditional products only. Since incentives to traditional exports have already been discussed, the following discussion is confined to nontraditional products; it refers to effective subsidy rates on total (domestic and export) sales.

Except in Singapore, where there was approximate equality, average effective subsidy rates in the economies studied were substantially lower in export industries than the average for all nontraditional primary industries (Table 2.5). In other trade categories, the pattern of effective subsidy rates varied from place to place. Import-competing industries were favored in Korea and Singapore, non-import-competing industries in Colombia and Israel, and export-and-import-competing industries in Argentina and Taiwan.

In manufacturing too, export industries generally received a much lower effective subsidy than the overall average for the sector. The exception is Israel, where manufacturing export industries had the highest effective rates. Elsewhere, effective subsidy rates were highest in import-competing manufacturing industries in Argentina, Colombia, Korea, and Taiwan. Differences among the four trade categories in manufacturing were small in Singapore.

Combining nontraditional primary and manufacturing activities, we find that rates of effective subsidy were lowest in nontraditional export industries except in Singapore. Effective subsidies were highest in import-competing industries except in Israel and Taiwan, where they were second to those in export-and-import-competing industries.

These results may be explained by the fact that export

Table 2.4. *Six Semi-industrial Economies: Relative Incentives to Sales in Domestic and in Export Markets, by Industry Group*
(ratio)

	Argentina, 1969			Colombia, 1969			Israel, 1968
	Nominal Protection	Effective Protection	Effective Subsidy	Nominal Protection	Effective Protection	Effective Subsidy	Nominal Protection
Agriculture (I)	1.00	1.00	1.00	1.39	1.40	1.35	1.12
Traditional	1.00	1.00	1.00	1.00	1.00	1.00	1.01
Nontraditional	-	-	-	0.90	0.89	0.82	1.10
Mining (IV)	1.30	1.52	1.49	0.79	0.88	0.87	1.07
Traditional	-	-	-	0.79	0.88	0.87	-
Nontraditional	1.30	1.52	1.49	-	-	-	1.07
Agriculture & Mining (I + IV)	1.05	1.05	1.05	1.23	1.34	1.30	1.12
Processed Foods (II)	1.17	2.05	1.88	0.89	0.59	0.48	1.26
Traditional	1.03	1.29	1.16	-	-	-	-
Nontraditional	1.19	2.15	1.98	0.89	0.59	0.48	1.26
Beverages & Tobacco (III)	1.67	n.d.	n.d.	1.09	1.16	1.07	1.19
Petroleum Products (ex VIA)	1.22	n.d.	n.d.	0.75	0.40	0.31	-
Diamonds (ex VIA)	-	-	-	-	-	-	1.00
Primary Activities (I-IV + Petroleum Products, Diamonds)	1.16	1.24	1.22	1.11	1.13	1.06	1.12
Traditional	1.00	1.02	1.01	1.02	0.97	0.95	1.01
Nontraditional	1.33	3.07	2.63	0.94	0.78	0.72	1.12
Construction Materials (V)	1.15	1.27	1.12	0.92	0.83	0.71	1.13
Intermediate Products I (VIA other)	1.76	3.62	3.22	1.14	1.24	1.02	0.99
Intermediate Products II (VIB)	1.71	n.d.	n.d.	1.12	1.52	1.21	1.24
Nondurable Consumer Goods (VII)	1.41	1.67	1.50	1.22	1.91	1.62	1.41
Consumer Durables (VIII)	1.68	n.d.	n.d.	1.32	n.d.	n.d.	1.43
Machinery (IX)	1.66	n.d.	n.d.	1.19	1.45	1.23	1.07
Transport Equipment (X)	n.d.	n.d.	n.d.	2.11	24.01	10.10	1.57
Manufacturing (V, VIA other, VIB-X)	1.75	3.41	2.92	1.16	1.42	1.20	1.30
Manufacturing & Simple Processing (II, III, V-X)	1.68	3.53	3.04	1.06	0.84	0.71	1.30
All Industries (I-X)	1.53	1.94	1.86	1.22	1.23	1.13	1.26
Traditional	1.00	1.02	1.01	1.02	0.97	0.95	1.09
Nontraditional	1.65	3.58	2.97	1.02	0.87	0.79	1.16

Note: The table shows the ratio of protection rates on sales in domestic markets plus one to protection rates in export markets plus one. Because of differences in weights given to domestic and export sales, averages

industries need the least protection while import-competing industries need the most. The relatively low effective subsidies in the non-import-competing industries of the most successful exporters—Korea, Singapore, and Taiwan—may be rationalized on the grounds that these industries had successfully replaced imports and were on the threshold of becoming export industries.

Adjusting for Overvaluation

Thus far we have considered the relative incentives provided to various economic activities at existing exchange rates. To indicate whether the system of incentives actually favors or disfavors a particular activity, calculations made at the existing exchange rate need to be adjusted by the difference between this rate and the

Israel, 1968		Korea, 1968			Singapore, 1967			Taiwan, 1969		
Effective Protection	Effective Subsidy	Nominal Protection	Effective Protection	Effective Subsidy	Nominal Protection	Effective Protection	Effective Subsidy	Nominal Protection	Effective Protection	Effective Subsidy
1.26	1.27	1.17	1.41	1.36	-	-	-	1.02	0.97	0.90
1.00	1.01	0.65	1.05	0.92	-	-	-	1.00	0.95	0.89
1.18	1.19	1.17	1.17	1.12	-	-	-	1.03	0.98	0.90
1.07	1.07	1.09	1.05	1.02	-	-	-	1.00	0.96	0.88
-	-	1.00	0.94	0.68	-	-	-	-	-	-
1.07	1.07	1.09	1.06	1.04	-	-	-	1.00	0.96	0.88
1.26	1.26	1.17	1.28	1.25	-	-	-	1.02	1.13	0.90
3.40	3.12	1.03	0.84	0.73	1.04	1.05	1.05	1.12	1.09	0.78
-	-	0.40	0.07	0.02	-	-	-	1.24	5.63	2.63
3.40	3.12	1.07	0.98	0.78	1.04	1.05	1.05	1.11	0.88	0.66
1.18	1.15	1.02	0.82	0.65	1.17	1.38	1.38	1.53	n.d.	n.d.
-	-	0.73	0.30	0.26	1.00	1.00	1.00	1.28	-1.30	0.44
1.00	1.00	-	-	-	-	-	-	-	-	-
1.26	1.54	1.11	1.16	1.11	1.05	1.13	1.11	1.07	1.04	0.89
1.00	1.10	0.50	0.18	0.11	-	-	-	1.02	1.11	0.75
1.29	1.47	1.12	1.12	1.06	1.05	1.13	1.11	1.08	1.05	0.91
1.16	1.24	1.04	0.93	0.78	1.06	1.17	1.15	1.00	0.91	0.81
0.82	0.85	1.13	0.80	0.69	1.03	1.04	1.05	1.15	1.20	0.84
1.49	1.58	1.21	1.26	1.02	1.08	1.15	1.15	1.20	1.37	0.97
2.11	2.06	1.12	0.91	0.75	1.02	1.01	0.99	1.15	1.14	0.98
2.27	2.18	1.39	1.73	1.35	1.11	1.16	1.16	1.32	1.55	1.12
1.13	1.13	1.30	1.65	1.26	1.09	1.10	1.09	1.11	1.02	0.87
2.88	2.81	1.55	n.d.	n.d.	1.02	0.98	0.98	1.31	1.80	1.51
1.63	1.32	1.19	1.10	0.93	1.05	1.06	1.05	1.18	1.26	0.97
1.63	1.63	1.12	0.95	0.81	1.05	1.09	1.08	1.18	1.34	1.01
1.50	1.50	1.14	1.10	1.01	1.05	1.09	1.08	1.12	1.10	0.89
1.11	1.10	0.45	1.18	0.11	-	-	-	1.02	1.11	0.75
1.39	1.38	1.15	1.09	0.99	1.05	1.09	1.08	1.13	1.13	0.91

for groups of sectors may be outside the sectoral averages. In cases when the designation n.d. (not defined) is used, domestic value added in exports is negative.

hypothetical exchange rate that would exist under free trade.

By means of the formula provided in the appendix at the back of the book, a range of hypothetical free-trade exchange rates has been estimated for each economy under alternative assumptions as to the domestic elasticities of export supply and import demand and the foreign elasticities of demand for its exports. The results together with the underlying assumptions are reported in the case studies of Part II.

When the most likely values of the relevant elasticities were used, the estimated percentage differences between the hypothetical free-trade exchange rate and the actual exchange rate in the period studied were: Argentina, 40.0; Colombia, 13.0; Israel, 51.0; Korea, 9.1; Singapore, 6.0; and Taiwan, 4.9. These figures have

Table 2.5. *Six Semi-industrial Economies: Effective Subsidy Rates, by Trade Category*
(percent)

	Argentina, 1969			Colombia, 1969		
	E	D	A	E	D	A
Export Industries	-14	-9	-10	-36	-34	-35
Traditional	-12	-12	-12	-41	-40	-40
Nontraditional	-26	40	8	27	-2	-4
Primary	-14	-10	-10	-37	-36	-37
Traditional	-12	-12	-12	-41	-40	-40
Nontraditional	-29	37	9	31	-8	0
Manufacturing	-20	71	2	20	10	12
Export-and-Import-Competing Industries	-32	112	96	10	25	21
Primary	-10	76	51	-	-	-
Manufacturing	-44	120	104	10	25	21
Import-Competing Industries	-59	130	124	-1	49	48
Primary	0	32	32	71	-3	0
Manufacturing	-59	131	125	-16	56	54
Non-Import-Competing Industries	-40	107	102	51	5	8
Primary	-62	46	46	52	3	6
Manufacturing	-42	111	108	15	19	19
All Industries	-17	55	47	-12	-1	-2
Traditional	-13	-12	-12	-45	-48	-48
Nontraditional	-33	99	95	36	8	10
Primary	-15	4	2	-14	-8	-9
Traditional	-13	-12	-12	-45	-48	-47
Nontraditional	-44	48	45	40	1	4
Manufacturing	-29	116	110	10	32	31

Note: Apart from the export industries category, which comprises traditional as well as nontraditional activities, all productive activities have been classified as nontraditional.

been used to adjust the estimates obtained at existing exchange rates. The resulting net effective subsidy rates are shown in summary form in Table 2.6. The detailed results, as well as the net nominal and effective protection rates, are reported in the case studies.

Table 2.6 shows that average net effective subsidy rates for all industries were approximately zero in all cases except Colombia. This result is also obtained for Colombia if we exclude coffee, which was not considered in estimating the hypothetical free-trade exchange rate because coffee exports were limited by quotas.

Using net effective subsidy rates to indicate the implications for resource flows of the system of incentives applied, we find that resources in the six economies were diverted from traditional to nontraditional uses. Also, except in Korea and Singapore, the incentives appear to have induced resources into manufacturing industries. Thus, average net effective subsidy rates for the manu-

Israel, 1968			Korea, 1968			Singapore, 1967			Taiwan, 1969		
E	D	A	E	D	A	E	D	A	E	D	A
16	67	35	9	-26	-13	6	8	7	11	-1	3
11	22	13	-11	-90	-52	-	-	-	50	296	137
28	78	59	14	-15	-5	6	8	7	10	-4	1
14	14	14	-5	-55	-34	13	13	13	6	-6	-2
11	22	13	-11	-90	-52	-	-	-	50	296	137
26	10	16	4	-19	-11	13	13	13	3	-11	-6
32	162	118	16	-15	-3	-1	-1	-1	19	7	11
37	109	92	8	52	35	-2	9	5	22	23	23
8	111	90	3	17	10	-3	15	9	16	-7	0
43	108	92	9	55	38	-1	6	4	23	27	25
-9	82	81	31	83	83	-3	15	15	10	5	5
-	96	96	2	72	71	0	72	71	6	0	0
-9	79	78	39	100	99	-4	-1	-1	15	61	55
37	70	70	7	4	4	-3	-6	-6	8	-9	-8
36	111	109	9	8	8	-3	-6	-6	9	-8	-7
38	43	43	2	-14	-14	-3	-6	-6	3	-18	-17
19	79	62	9	10	10	1	8	6	16	2	5
11	22	13	-11	-90	-52	-	-	-	24	-7	-6
31	82	74	12	11	11	1	8	8	15	5	7
14	75	47	0	11	11	4	15	12	9	-3	-2
11	22	13	-11	-90	-52	-	-	-	24	-7	-6
24	81	71	7	13	13	4	15	12	8	-2	-1
38	82	76	14	7	8	-1	4	2	21	17	18

facturing sector were: Argentina, 38 percent; Colombia, 10 percent; Israel, 7 percent; Korea, −11 percent; Singapore, −4 percent; and Taiwan, 9 percent.

Except for construction materials, which appear to have been disfavored except in Singapore, the system of incentives benefited all industrial groups within manufacturing in Argentina and Colombia, and all these groups other than machinery in Israel and Taiwan. Durable consumer goods and intermediate products at lower levels of transformation were favored in Korea and Singapore; in addition, machinery was favored in Singapore.

Manufactured exports received net incentives in Korea and Taiwan, whereas disincentives to exports of manufactures and traditional primary products were most pronounced in Argentina. Finally, traditional primary exports were favored by the incentive system in Colombia and, to a lesser extent, in Taiwan.

Table 2.6. *Six Semi-industrial Economies: Net Effective Subsidies, by Industry Group*
(percent)

	Argentina, 1969			Colombia, 1969			Israel, 1968			Korea, 1968			Singapore, 1967			Taiwan, 1969		
	E	D	A	E	D	A	E	D	A	E	D	A	E	D	A	E	D	A
Agriculture (I)	-37	-37	-37	-40	-19	-23	-21	-2	-8	-18	12	11	-	-	-	-3	-13	-12
Traditional	-37	-37	-37	-55	-55	-55	-21	-20	-21	-45	-50	-46	-	-	-	-4	-14	-14
Nontraditional	-	-	-	10	-10	-9	-19	0	-1	0	12	12	-	-	-	-3	-12	-11
Mining (IV)	-38	-12	-12	-14	-25	-23	-25	-24	-25	-7	-5	-5	-	-	-	-3	-15	-14
Traditional	-	-	-	-14	-25	-23	-	-	-	-5	-35	-11	-	-	-	-	-	-
Nontraditional	-38	-11	-12	-	-	-	-25	-24	-25	-8	-4	-4	-	-	-	-3	-15	-14
Agriculture & Mining (I - IV)	-37	-34	-35	-38	-18	-23	-22	-4	-10	-11	11	10	-	-	-	-3	-13	-12
Processed Foods (II)	-51	-5	-18	58	-12	-7	-27	80	38	-8	-33	-31	-6	-2	-3	15	-9	0
Traditional	-49	-40	-45	-	-	-	-	-	-	-11	-98	-73	-	-	-	9	200	75
Nontraditional	-51	-3	-10	58	-12	-7	-27	80	38	-3	-24	-23	-6	-2	-3	17	-24	-10
Beverages & Tobacco (III)	-330	29	24	-3	4	4	-7	7	6	4	-33	-32	-13	19	12	218	22794	13019
Petroleum Products (ex VIA)	-244	-4	-4	101	-38	-11	-	-	-	-7	-75	-72	8	8	8	124	47	49
Diamonds (ex VIA)	-	-	-	-	-	-	-33	-	-33	-	-	-	-	-	-	-	-	-
Primary Activities (I-IV + Petroleum Products, Diamonds)	-40	-27	-29	-25	-20	-20	-26	6	-8	-10	1	1	-2	8	5	2	-9	-8
Traditional	-38	-37	-37	-52	-54	-53	-27	-20	-26	-19	-91	-57	-	-	-	3	-12	-11
Nontraditional	-63	-1	-3	21	-11	-9	-24	9	3	-4	3	2	-2	8	5	2	-7	-6
Construction Materials (V)	-22	-12	-12	15	-22	-17	-	-24	-24	-6	-26	-25	-11	5	4	-1	-20	-17
Intermediate Products I (VIA other)	-45	66	51	0	1	1	28	11	14	29	-10	-4	-7	-2	-4	20	1	5
Intermediate Products II (VIB)	-104	48	43	-15	4	4	-33	8	3	3	5	5	-6	8	3	19	14	16
Nondurable Consumer Goods (VII)	-31	2	1	-26	20	19	-29	41	23	-6	-29	-24	-9	-10	-10	2	1	2
Consumer Durables (VIII)	-100	60	60	170	28	26	-51	25	22	-10	20	15	-6	9	3	16	33	26
Machinery (IX)	-17	52	49	-16	3	2	-31	-22	-22	-16	16	15	-6	3	0	3	-10	-7
Transport Equipment (X)	0	96	96	-74	161	161	-	72	72	-95	119	119	-7	-9	-9	3	50	40
Manufacturing (V, VIA other, VIB-X)	-50	41	38	-7	10	10	-15	11	7	1	-13	-11	-7	-2	-4	11	8	9
Manufacturing & Simple Processing (II, III, V-X)	-52	40	31	42	1	4	-26	14	4	0	-19	-17	-5	2	0	12	13	13
All Industries (I-X)	-41	6	1	-23	-14	-15	-24	9	0	-3	-1	-1	-5	2	0	7	-4	-2
Traditional	-38	-37	-37	-52	-54	-53	-27	-20	-26	-19	-91	-57	-	-	-	3	-12	-11
Nontraditional	-54	32	29	17	-7	-5	-20	10	6	-1	-1	-1	-5	2	0	7	-4	-2

Note: Net effective subsidies for each country have been derived by adjusting the effective subsidy rates calculated at the existing exchange rate for the extent of overvaluation in that country. For explanation, see text. Agriculture is defined to include forestry and fishing; mining comprises mining and energy.

Conclusion

Several conclusions emerge from the estimates presented in this chapter. The incentive system discriminated against traditional exports in each of the economies studied, although the extent of discrimination was relatively small in Israel and in Taiwan. Among nontraditional activities, the incentive system strongly favored the manufacturing sector in Argentina and in Colombia. Incentives in Taiwan discriminated relatively little against nontraditional primary activities; the apparent extent of discrimination would be reduced further if account were taken of the preferential tax treatment of agricultural profits. Finally, nontraditional primary activities were favored over manufacturing to some extent in Korea and Singapore; they received approximately equal treatment in Israel.

Among manufacturing activities, there was a strong bias against exports in favor of domestic sales (that is, import substitution) in Argentina, a smaller bias in Colombia and Israel, and virtually none in Singapore. In Korea and Taiwan, the incentive system slightly favored exports over domestic sales of manufactured products. Incentives to exports in relation to domestic sales show a similar pattern for nontraditional primary activities in the economies in question, except that Colombia favored exports over domestic sales.

All in all, the incentive systems in Korea, Singapore, and Taiwan appear to have discriminated least between nontraditional primary and manufacturing activities, and between sales in export and in domestic markets. And while effective subsidy rates varied for domestic sales, they were relatively uniform for export sales and thus reflect the free-trade treatment of exports, with some additional subsidies.

In Argentina and, to a lesser extent, in Colombia, there was a bias in favor of import substitution and against exports within the manufacturing sector, and in favor of this sector and against nontraditional primary activities. In Colombia, however, exports were favored over import substitution in nontraditional primary activities. Finally, in Israel nontraditional primary and manufacturing activities received equal treatment and there was a bias against exports in all major sectors, though the bias against traditional primary exports was only slight.

Notes to Chapter 2

1. See S. Guisinger, "Negative Value-Added and Effective Protection," *Quarterly Journal of Economics*, vol. 83 (August 1969), pp. 415–33.

2. See J. Bhagwati and P. Desai, *India: Planning for Industrialization* (London and New York: Oxford University Press, 1970).

3. Statistical measures of dispersion have not been calculated in either case because these cannot accommodate instances of negative world market value added, which are at one extreme of the distribution of protection and subsidy measures.

4. B. I. Cohen, "The Use of Effective Tariffs," *Journal of Political Economy*, vol. 79 (January/February 1971), pp. 128–41.

5. I am indebted to Larry Westphal for this point.

6. B. Balassa and Associates, *The Structure of Protection in Developing Countries* (Baltimore, Md.: Johns Hopkins University Press, 1971), p. 51.

7. M. Holden and P. Holden, "Effective Tariff Protection and Resource Allocation: A Non-Parametric Approach," *Review of Economics and Statistics*, vol. 60 (May 1978), pp. 294–300.

8. See Balassa and Associates, *Structure of Protection in Developing Countries*, p. 319.

9. No attempt has been made to separate nonferrous metals from other mining products since they are of little importance in the exports of the countries concerned.

10. See B. Balassa, "Tariff Protection in Industrial Countries: An Evaluation," *Journal of Political Economy*, vol. 73 (December 1965), pp. 573–94; and Balassa and Associates, *Structure of Protection in Developing Countries*.

11. In this connection, it should be recalled that effective rates equal the ratio of domestic to world market value added, less one. Under the assumption of equal c.i.f. and f.o.b. prices, value added in world market prices will be the same for domestic and export sales. If one is added to the effective rate calculated for domestic sales and to that for export sales, the ratio of the two rates will equal the ratio of the domestic value added in sales in domestic markets to that in sales in export markets.

3

Development Strategies and Economic Performance: A Comparative Analysis of Eleven Semi-industrial Economies

BELA BALASSA

This chapter provides a comparative evaluation of development strategies and economic performance in eleven semi-industrial economies. The investigation covers the six economies included in Part II of the volume—Argentina, Colombia, Israel, Korea, Singapore, and Taiwan—as well as Brazil, Chile, India, Mexico, and Yugoslavia. The period chosen for the investigation is 1960 to 1973 because in subsequent years economic performance was much affected by the oil crisis.

The chapter begins with a discussion of alternative ways of classifying development strategies. It presents a fourfold classification scheme and analyzes the policies followed by the economies in the four groups. Subsequently, the chapter examines the relationship between development strategies and export expansion in the eleven economies and relates their economic performance to the policies they have followed.

Development Strategies in Eleven Semi-industrial Economies: Classification Scheme

In the present volume, development strategies have been classified as outward oriented or inward oriented, depending on whether sales in domestic and in foreign markets receive similar incentives in terms of effective subsidies, or whether the system of incentives favors domestic sales over foreign sales in that it entails a bias in favor of import substitution and against exportation (in short, an anti-export bias).[1] This definition may be contrasted with definitions put forward in two comparative studies: the research project on export strategies and industrialization in developing countries, conducted at the Kiel Institute of World Economics under the direction of Juergen Donges, and the research project on foreign trade regimes and economic development, conducted under the auspices of the National Bureau of Economic Research (NBER) by Jagdish Bhagwati and Anne Krueger.[2]

Alternative Classifications of Development Strategies

The distinction made in the Kiel studies between export diversification and import substitution strategies closely parallels that used here.[3] The NBER studies have classified trade and payments regimes in five phases on the basis of the use of quantitative controls, and they have used this classification scheme to distinguish between export-promoting and import-substituting strategies. According to Krueger, "the basic principle of classification underlying the five phases is the extent to which a country relies on quantitative—as opposed to price—measures as a means of regulating its trade and payments."[4] Furthermore, Bhagwati claims that Phases IV and V can be identified with an export-promoting strategy, defined as the provision of equal incentives to

importables and exportables, in contrast with an import-substituting strategy in which the incentive system is biased in favor of importables.[5]

Bhagwati's claim raises conceptual as well as empirical issues. To begin with, the distinction between importables and exportables used by both Bhagwati and Krueger neglects the possibility that a commodity may be imported *or* exported, depending on the incentives provided, and that a commodity may be imported *and* exported given the product differentiation prevalent in manufacturing industries. Also, the concept of anti-export bias is defined by these two authors in terms of nominal rather than effective rates.[6] While their emphasis is on quantitative import restrictions, the NBER studies do not provide information on the ratio of domestic to foreign prices that would indicate the protective effects of these restrictions. Finally, in concentrating on quantitative measures, Bhagwati and Krueger divert attention from the protective effects of tariffs,[7] although tariffs may discriminate against exports as much as or even more than do quantitative restrictions. In this connection, reference may be made to the experience of the six economies studied in detail in Part II.

Argentina relied exclusively on tariffs and on other price measures but exhibited by far the strongest anti-export bias. By contrast, Korea and Taiwan made use of import restrictions but nevertheless showed no such bias. And Israel, the only country Bhagwati and Krueger classified in Phase V, had a stronger bias in favor of import substitution and against exportation than did Korea and Colombia, both of which Bhagwati and Krueger classified in Phase IV (see Table 2.4).[8] There were also considerable differences in policies between Korea and Colombia as well as between Korea and Brazil (also classified in Phase IV in the NBER studies).[9]

It follows that one cannot identify Phases IV and V with an export-promoting—as contrasted with an import-substituting—strategy or, for that matter, with an outward-oriented as against an inward-oriented strategy. Nor can one establish a correspondence between the use of quantitative restrictions and the extent of bias in favor of import substitution and against exportation. This lack of correspondence is hardly surprising since the distinction between outward-oriented and inward-oriented strategies is based on the absence, or presence, of an anti-export bias, while the five phases of the NBER studies have been distinguished on the strictly formal grounds of whether import protection takes the form of nonprice (quantitative) or price (tariff) measures.

The Fourfold Classification Scheme

The eleven semi-industrial developing economies studied were chosen on the basis of the size of their manufacturing sector; they alone among developing economies had value added in manufacturing exceeding US$3,000 million in 1970.[10] In 1973, the terminal year of the investigation, the eleven economies under consideration accounted for 68 percent of the exports of manufactured goods by the developing countries. Another 16 percent came from Hong Kong, which has a longer history as an exporter of manufactures. No other developing economy accounted for more than 2 percent of the total.

The eleven economies have been classified into four groups, depending on the policies applied during the post–World War II period. Those in the first group, Korea, Singapore, and Taiwan, adopted outward-oriented policies following the completion of the first stage of import substitution, which entailed replacing imports of nondurable consumer goods and their principal inputs by domestic production. In all three cases an essentially free-trade regime was provided for exports, with some additional subsidies granted, and thus the bias in the incentive system against exports was removed.

The second group, Argentina, Brazil, Colombia, and Mexico, began their export promotion efforts after continued import substitution in the framework of national markets had encountered increasing difficulties. They provided various subsidies to exports, but by and large precluded the use of imported inputs in export production whenever domestic substitutes were available. As a result of these measures, the bias against exports was reduced but not eliminated.

The third group, Israel and Yugoslavia, had started export promotion at an early date, but their efforts slackened somewhat afterward. Finally, Chile and India, classified in the fourth group, continued to pursue policies of import substitution during the period under consideration.

The First Group: Korea, Singapore, and Taiwan

Except for the city-state of Hong Kong, where industrialization began in the framework of an open economy, export promotion policies were generally introduced after some degree of import substitution in the protected domestic market. The extent of protection and the sequencing of import substitution and export promotion varied among economies, however, depending on objective conditions as well as on the subjective evaluation of the desirability of alternative actions by the policymakers. Although differences in policies are often rationalized after the fact by reference to objective conditions, governmental decisions have played a crucial role in the cases studied.

It has repeatedly been claimed, for example, that

objective conditions forced the two city-states, Hong Kong and Singapore, to orient their manufacturing industries toward export markets. In support of this proposition, it has been stated that "Hong Kong and Singapore are almost totally lacking in natural resources. Unlike the developing nation-states of Asia, Africa, and Latin America, the two city-states do not have their own rural hinterlands. Nor do they have domestic markets large enough to serve as the initial base for industrialization."[11]

With a population of 2 million in 1950 and relatively high per capita income derived from trading activities, however, Hong Kong had a larger domestic market for manufactured goods than the majority of the developing countries, many of which nevertheless embarked on industrialization behind high protective barriers. Tunisia, for example, with a home market smaller than that of Hong Kong, attempted to provide for domestic needs in small local plants that were to receive continued protection.[12]

Hong Kong, too, could have chosen to supplement incomes derived from trading activities by exporting a few manufactured goods while relying on domestic markets for the establishment of a wide range of industries behind protection. Its policymakers should thus be given their due for avoiding the bias against exports found in most developing countries. The adoption of a neutral policy stance between production for domestic and for export markets led to increases in Hong Kong's per capita income at an average annual rate of 6.6 percent between 1960 and 1973—far in excess of the growth rates attained in countries that followed inward-oriented policies.

The other city-state, Singapore, went through a short import-substitution phase (roughly between 1965 and 1967) aimed at establishing domestic industries serving the home market. Subsequently, "In pursuance of the policy of providing protection to industries in Singapore, the import of a number of goods which were in various stages of manufacture locally or which were likely to be manufactured in the near future, was made subject to licensing and/or quota restrictions."[13] In contrast with most other developing countries, however, protection was considered temporary and was made subject to periodic reviews, with quotas to be superseded by tariffs that, in turn, were to be lowered and eventually eliminated.[14] The number of commodities subject to quotas and tariffs was greatly reduced, and the remaining tariffs were lowered after 1967, when the short import-substitution phase came to an end.

Even during its import substitution phase, the level of protection was lower in Singapore than in other developing economies that followed such policies; effective rates of subsidy on manufactured goods in 1966 exceeded 20 percent only in a few cases. With low levels of import protection, there was little discrimination against exports. The latter enjoyed a free-trade regime, as inputs used in export production were admitted duty free without any limitations, and exports received incentives in the form of tax allowances on marketing expenditures abroad. Incentives to exports were increased further in 1967, when the tax rate on profits earned by approved manufacturing companies from exports was lowered from 40 to 4 percent. After reductions in import protection and increases in export subsidies, by the end of the 1960s production for domestic and for export markets received, on the average, equal treatment.

By about 1960 Korea and Taiwan had completed the first, "easy" stage of import substitution, which entailed the replacement of imports of nondurable consumer goods and their principal direct inputs by domestic production. At that time, both decided to adopt outward-oriented policies that provided broadly similar incentives to exports and to import substitution.[15] These decisions were based on a desire to accelerate economic growth in a situation where continued import substitution in the framework of national markets would have become increasingly costly.

Emphasis should be given to the element of deliberate decision in undertaking policy reforms in both these cases. Thus, in 1960 Korea, with a population of 25 million, and Taiwan, with a population of 10 million, had domestic markets for manufactured goods larger than those of most developing economies, including Chile and Uruguay, which continued with policies of import substitution beyond the first, easy stage. Moreover, while the transition of Korea and Taiwan to an outward orientation is said to have been facilitated by their well-educated labor force, Chile and Uruguay also had highly educated populations.

Exporters enjoyed a free-trade regime in both Korea and Taiwan. They were free to choose between domestic and imported inputs; they were exempted from indirect taxes on their output and inputs; and they paid no duty on imported inputs. The same privileges were extended to the producers of domestic inputs used in export production. These provisions gave virtually equal treatment to all export commodities in the two countries, the only exception being ginseng in Korea (accounting for 5.8 percent of exports in 1953 and 0.2 percent in 1973), for which the country exploited its monopoly position by imposing an export tax. The few additional export subsidies granted did not introduce much differentiation among export products. At the same time, the stability of the sytem of incentives, the automatic application of the regulations, and the favor-

able attitude taken by the two governments toward exports enhanced the effectiveness of the measures applied.

In Korea the subsidy equivalent of the export incentive measures, including wastage allowances,[16] reductions in direct taxes, credit preferences, and preferential electricity and railroad rates, amounted to 14 percent of the value added in manufactured exports in 1968. In the same year, the average rate of effective subsidy on the domestic sales of manufactured goods was 7 percent. Furthermore, unlike the systems of most other semi-industrial developing economies, Korea's incentive system was not biased against primary activities, and within the primary sector there was little discrimination against exports. The export incentive scheme underwent few modifications between 1968 and 1972, while exports benefited from the depreciation of the Korean won in excess of increases in domestic prices.

In Taiwan reductions in direct taxes, preferential credits, facilities for the rapid collection of export proceeds, and direct subsidies to the exports of several commodities provided an effective rate of subsidy of 21 percent to manufactured exports in 1969, compared with a rate of 17 percent to the domestic sales of manufactured goods. Exports were also favored over import substitution in the primary sector, and there was little discrimination against primary activities taken together. The incentive system remained practically unchanged in the following four years.

The Second Group: Argentina, Brazil, Colombia, and Mexico

The second group, Argentina, Brazil, Colombia, and Mexico, continued with import substitution beyond the completion of its first, easy stage. Import substitution became increasingly costly as it was extended to industries that were highly capital intensive, that required sophisticated technology, and that could not produce on an efficient scale or fully utilize their capacity, given the limited size of domestic markets; at the same time, exports were obstructed by the import-substitution bias of the incentive system.

Given the need for imported raw materials, intermediate products, and machinery, the extent of *net* import substitution in these industries was rather small. Also, the policies followed had adverse effects on primary exports and obstructed the development of manufacturing exports. The resulting foreign exchange bottleneck limited the possibilities for economic growth and in some instances led to the application of stop-go policies.[17]

Exports offered a way to break the foreign exchange bottleneck through the increased use of existing capacity, the application of large-scale production methods, and resource allocation according to comparative advantage. Thus, the desire to accelerate economic growth in the face of limitations to import substitution largely explains the adoption of export promotion measures in the mid-1960s. But Colombia had already begun some such efforts around 1960, while in Mexico export promotion was limited to the establishment of a free-trade zone until 1971.

As foreign exchange receipts from exports increased, balance of payments equilibrium could be reached at a lower exchange rate, in terms of domestic currency per unit of foreign exchange, than would have otherwise been the case. Given world market prices, the domestic prices of imports declined and thereby reduced the protective effects of existing tariffs. Increases in foreign exchange earnings eventually permitted tariff reductions and the liberalization of import quotas. The adoption of export promotion policies thus directly and indirectly led to a reduction in the protection of domestic markets.

In Colombia the shift to export promotion began in 1959 with the introduction of the Plan Vallejo, which provided duty-free entry for imported inputs used in export production on a selective basis. The Plan Vallejo came into more general application for manufactured exports in the mid-1960s, but it continued to be limited largely to inputs that were not available domestically. Starting in 1960, profits on nontraditional exports—export products other than coffee and petroleum—were to be exempted from taxes; these profits were presumed to equal 40 percent of export value. In practice, however, these provisions were subject to discretionary decisionmaking. In the course of the March 1967 reforms, this administratively cumbersome system was replaced by a transferable tax certificate equal to 15 percent of the value of nontraditional exports. Adjusted for the tax-free value of these certificates and the discount at which they were traded, the subsidy on export value was 18 percent. Under the reforms, exporters were also given access to credits at preferential rates, and an export promotion agency (PROEXPO) was set up.

Exporters in Colombia nonetheless had to pay high prices for domestically produced inputs. With continued protection of domestic sales in the manufacturing sector, there remained a bias against exports and in favor of import substitution, as indicated by effective subsidy rates of 10 percent and 32 percent on sales in export and in domestic markets, respectively, in 1969. Though imports were liberalized after 1969, the bias against manufactured exports remained during the period under consideration. Export subsidies expressed in relation to

value added varied to a considerable extent among industries. There was discrimination against primary activities, traditional as well as nontraditional, although nontraditional primary exports received favorable treatment.

Apart from the export promotion scheme, an important part of the 1967 reforms in Colombia was a substantial devaluation of the exchange rate, which increased the domestic currency equivalent of foreign exchange earnings and was followed by exchange rate adjustments made in small steps in line with the rate of domestic inflation. Brazil and Argentina, too, instituted frequent exchange rate adjustments in line with inflation, which reduced uncertainty in foreign sales by keeping the real exchange rate constant. These adjustments followed the introduction of export incentive schemes in the mid-1960s.

In 1965–67 Brazil generalized exemptions from indirect taxes on processed exports (processed foods and minerals, and manufactured products) and duty drawbacks on imported inputs used in export production, both of which had been provided on a partial basis in the first half of the 1960s. Starting in the late 1960s, export subsidies were introduced in the form of tax credits, reductions in income taxes, and preferential export financing; some additional incentives were introduced in the early 1970s.

The subsidy equivalent of the tax benefits averaged 15 percent of the value of Brazilian exports of processed goods in 1971, to which another 3 percent should be added for the average subsidy equivalent of preferential financing. Subsidies to export value varied to a considerable extent, ranging from 8 percent on wood products to 37 percent on apparel and footwear.[18]

Variations in subsidies to value added in exports were even larger. Brazilian exporters did not generally have the choice between domestic and imported inputs; apart from some exceptions introduced in the early 1970s, they had access to duty-free imports only if a similar domestic product was not available. Subsidies to value added in exports thus varied according to the input composition of export production and the rate of protection of inputs.

Notwithstanding the reductions in tariffs undertaken after 1966, the average tariff on the import of manufactured goods continued to exceed the average subsidy to exports, with the average tariff estimated at 57 percent in 1973.[19] At the same time, the variability of tariffs and export subsidies and the existence of interindustry differences in protection rates on inputs gave rise to considerable variations in relative incentives to exports and to import substitution. Finally, although Brazil promoted selected agricultural exports from the late 1960s onward, discrimination against other primary activities continued.

In Argentina in 1967, a 12 percent subsidy was granted to exports other than grain, oilseed, livestock, and their derivatives, which were subject to an export tax of 10 percent. The 12 percent subsidy was provided in the form of a tax reimbursement and was not subject to income taxes, so that its value was equivalent to 17 percent on a pretax basis. An additional subsidy of 3 percent was granted in the form of income tax deductions. Furthermore, exporters had access to preferential credits and received subsidies, theoretically representing drawbacks for tariffs paid on imported inputs; such drawbacks were determined industry by industry.

In most Argentine industries, however, these subsidies did not suffice to offset the high cost of domestic inputs used in export production. Discrimination against exports was further augmented by the high protection accorded to import substitution. Thus, in 1969 effective subsidy rates averaged −29 percent on manufactured exports, while import substitution in manufacturing received an effective subsidy of 116 percent on the average. There was also substantial discrimination against both traditional and nontraditional primary activities, and export subsidies on a value added basis varied greatly among sectors. Finally, in both Argentina and Brazil, as well as with regard to the Plan Vallejo in Colombia, discretionary decisionmaking on export incentives had a greater role than in the Far Eastern economies.

In Mexico border industries processing imported materials for reexport, principally to the United States, were accorded duty-free treatment beginning in the mid-1960s. There were, however, few subsidies to domestic export industries until 1971, when a tax rebate scheme was introduced together with a system of preferential export credits. In 1973 tax rebates were 11 percent on manufactured exports that had a domestic content in excess of 60 percent, and 5.5 percent on exports with a domestic content of 50 percent, with no rebates payable for exports with lower proportions. The rebates largely represented compensation for indirect taxes paid at earlier stages of fabrication; they averaged 8.5 percent of the value of all manufactured exports, while the subsidy equivalent of preferential export credit amounted to 1.5 percent.[20] Exporters could import inputs duty free on a selective basis, but this was administratively difficult and did not apply to inputs that were also produced domestically. Primary commodities received none of these incentives, and continued to be subject to discrimination.

The Third Group: Israel and Yugoslavia

Israel and Yugoslavia were among the first countries to introduce export incentives. Israel unified its system of export incentives in 1956, introducing a uniform sub-

sidy on value added in exports other than the traditional export commodities (citrus and diamonds). Nevertheless, some additional subsidies remained, including the so-called branch funds for the textile industry, preferential credits, and tax refunds on promotional expenditures. In 1962 the across-the-board subsidies were transformed into a higher exchange rate, but the effects of this had worn off by 1965, so that there was a considerable degree of discrimination against exports and in favor of import substitution in that year. In 1966 explicit export subsidies were again introduced, but they were generally lower than tariffs, and incentives to import substitution were raised further by the continued existence of import licensing on a variety of commodities.

As a result, Israel's effective subsidy rates averaged 82 percent on domestic sales and 38 percent on export sales of manufactured goods in 1968. There was practically no bias against nontraditional primary activities, however, and traditional primary exports, too, received subsidies and thus suffered less discrimination than in the economies of the second group. Relative incentives to import substitution and exports did not change until 1973.[21]

In Yugoslavia multiple exchange rates and the partial retention of foreign exchange earned through exporting were used to provide incentives to exports during the 1950s; in 1957 the average exchange rate for exports was about 40 percent higher than that for imports. The multiple rate system was transformed into a system of export subsidies and import tariffs in 1961. Export subsidies were abolished in 1965, and benefits to exports were subsequently limited to foreign exchange retention quotas and to preferential export credits. These retention quotas amounted to only 1.8 percent of the value of exports, however, and with the liberalization of import restrictions, they had negligible value. Although import liberalization and tariff reductions subsequently lowered the level of import protection, the period 1966–73 was characterized by an anti-export bias.[22]

The Fourth Group: Chile and India

During the period studied, the fourth group of economies continued to follow policies of import substitution, which entailed a considerable degree of discrimination against exports. In India the 1966 devaluation of the rupee was supposed to benefit exports, but with reductions in export subsidies and increases in export taxes accompanying the devaluation, the bias of the incentive system in favor of import substitution and against exportation increased rather than decreased.[23] The export incentive measures that India introduced subsequently, including cash subsidies, duty drawbacks, import licenses, and preferential licensing for capacity expansion, were in general subject to complex procedures and considerable uncertainty as to their availability. Moreover, cash subsidies were apparently related to the excess variable costs of domestic production over export prices, so that high-cost exports received above-average subsidies while the lowest rates applied to exports that had relatively low domestic costs.[24] The situation was aggravated by restrictions on the transferability of import licenses and by the virtual exclusion of imported inputs that had domestic substitutes. The development of manufactured exports was further discouraged by limitations imposed on firm size and on investments by large firms. At the same time, major primary exports and traditional manufactured export products were subject to export taxes.

Considering further the continued protection of manufacturing industries by the use of import prohibitions and quantitative restrictions, it would appear that in general India maintained its orientation toward import substitution during the period studied. Changes occurred only at the end of the period, when India devalued the rupee in line with the depreciation of the British pound, and export subsidies came into increased use.

Chile traditionally maintained the highest level of import protection in Latin America.[25] The high level of protection entailed considerable discrimination against primary activities and penalized the processing of domestic materials for exports in which Chile has a comparative advantage. In the late 1960s the introduction of tax rebates on nontraditional exports, combined with import liberalization, reduced this bias to some extent. Many of the measures applied were reversed after the presidential election of 1970, however, when a greatly overvalued exchange rate and severe import restrictions discriminated against exports.

Development Strategies and Export Expansion

This section examines the effects of the system of incentives on the trade orientation of the economy in general, and on the growth of exports in particular. Further consideration will be given to the role of government interventions in export expansion and to the sequencing of import substitution and the development of exports.

Incentives and Export Performance

The incentive system applied in a particular country is expected to affect the trade orientation of its national economy. Thus it can be hypothesized that, other things being equal, the higher the level of import protection, the smaller the share of imports *and* exports in GNP. This

proposition has been tested in an intercountry framework, covering fourteen developed and seven developing economies.[26] Following earlier work by Chenery,[27] other variables included in the regression were per capita incomes Y/P and population P. The results reported below show that, on the average, a 1 percent increase in tariffs T is associated with a 0.45 percent decrease in imports M (t values in parentheses):

$$\log M = \underset{(2.63)}{1.03} + \underset{(7.66)}{0.76} \log Y/P + \underset{(0.67)}{0.63} \log P - \underset{(2.75)}{0.45} \log T. \qquad R^2 = 0.90$$

With exports and imports tending toward equality in the long run, a similar relation would apply to exports.

The trade literature contains several attempts to examine the effects of export incentives on export growth in individual countries. Efforts to establish a statistical relationship between the two variables have, however, encountered various difficulties. For estimation in a time-series framework, these difficulties include the shortness of the available time series, the difficulties of quantifying the effects of other influences on exports, and the lack of information on changes in incentives to import substitution, which give rise to an anti-export bias. Estimating the relationship in a cross-sectional framework is made difficult by the lack of stability of the incentive system and by lags in the adjustment to incentives.

Studies for several of the countries under consideration nevertheless show the existence of a positive relationship between export incentives and export growth. In their cross-sectional investigation of ninety-one sectors in Korea, Westphal and Kim obtained rank correlation coefficients of 0.29 and 0.26 between export incentives in 1968 on the one hand, and the share of exports in output in 1968 and the contribution of exports to the increase in output between 1960 and 1968 on the other;[28] the coefficients are significant at the 1 percent level (see Chapter 8). For Colombian nontraditional exports, Diaz-Alejandro estimated elasticities to be from 0.8 to 0.9 for the growth of exports in response to exchange rate changes,[29] while Teigeiro and Elson obtained an export elasticity of 1.3 with respect to the exchange rate and export incentives combined.[30] An export elasticity of 1.3 was also obtained in time-series studies of Brazil, Colombia, and Israel carried out in the framework of the Kiel project and in Krueger's study pooling time-series and cross-sectional data for ten countries.[31]

The estimates cited here may be considered to provide lower limits of possible values, in part because of the downward bias caused by the use of the least-squares method of estimation and in part because of the difficulties of capturing the lagged effects of the introduction of export incentives. At any rate, the estimates relate only to quantifiable export incentives, and success in exporting also depends on nonquantifiable factors, such as the policy environment. For example, an export-mindedness on the part of the three Far Eastern governments played a role in promoting exports, for exporters were assured that the system of incentives would not change to their disfavor. In Brazil and Colombia, too, government pronouncements on the need for increased outward orientation complemented the export incentives provided.

Definitions and Commodity Breakdown

The following discussion distinguishes between primary and manufactured exports and, within the former category, between traditional and nontraditional exports. Primary exports are defined to include SITC Sections 0 to 4 as well as diamonds and unwrought nonferrous metals. As noted in Chapter 2, primary commodities that accounted for at least 2 percent of a country's total exports in 1953 have been considered traditional export products. Information is also provided on the export of agricultural products, which include livestock, fishery, and forestry products, and comparisons are made with data on agricultural production.

Data on the rates of growth of the dollar value of exports of the above groups of commodities and for total exports are reported for the periods 1953–60, 1960–66, and 1966–73 in Table 3.1; absolute figures are shown in Appendix Table 3.1 at the back of this book. The discussion will concern developments since 1960 and, in particular, the period 1966–73 when export promotion efforts in the first group of economies were in full operation.

In interpreting the rates of growth of manufactured exports in the period 1960–66, it should be kept in mind that most of the countries in question started from a small base. To allow for this fact, we also calculated the share of exports in manufactured output for the benchmark years, as well as incremental export-output ratios, defined as the ratio of the increment in manufactured exports to that in manufactured output (Table 3.2). The data on manufacturing output were made comparable with those on trade by deducting processed foods (ISIC 311, 312), beverages (313), tobacco manufactures (314), refined petroleum (353), coal and petroleum products (354), unwrought nonferrous basic metals (ex 372), and diamonds (ex 390) from the output figures reported according to the International Standard Industrial Classification.

In estimating export growth rates, current price data had to be used because in most of the economies under

Table 3.1. *Eleven Semi-industrial Economies: Growth of the Value of Exports and Imports*
(average annual percentage growth rate)

	Argentina	Brazil	Chile	Colombia	India	Israel	Korea	Mexico	Singapore	Taiwan	Yugoslavia
Primary Products											
Traditional											
1953-60	0.7	-5.3	4.3	-4.5	2.4	16.8	-17.5	-0.3	-	-3.2	3.6
1960-66	6.7	2.0	9.5	-0.5	0.3	15.2	26.5	3.8	-	8.0	11.6
1966-73	6.9	7.6	5.1	6.5	0.2	16.7	16.9	1.7	-	1.2	12.5
Nontraditional											
1953-60	-3.4	5.4	-5.6	11.9	5.6	47.0	7.1	12.2	n.a.	12.7	19.6
1960-66	3.6	9.6	11.3	5.9	9.2	16.8	22.5	10.3	29.5	36.5	2.3
1966-73	14.0	26.5	7.6	25.5	10.4	16.9	35.5	6.3	19.5	25.0	11.1
All Primary Products											
1953-60	0.2	-3.1	2.5	-3.5	3.7	20.5	-5.4	3.8	n.a.	-1.2	12.4
1960-66	6.3	4.7	9.7	0.3	4.5	15.5	24.0	6.9	29.5	17.3	5.7
1966-73	7.8	17.0	5.5	10.7	6.5	16.8	26.0	4.3	19.5	17.0	9.8
Of Which Agricultural Goods											
1953-60	0.2	-3.5	-9.0	-4.8	3.9	18.3	-3.2	5.4	n.a.	-2.1	14.5
1960-66	6.2	4.5	22.5	1.0	3.7	9.5	25.2	7.7	2.9	15.6	6.7
1966-73	7.9	16.7	2.7	11.1	9.5	11.7	29.5	5.7	19.2	16.3	9.8
Manufactured Goods											
1953-60	-11.7	9.9	3.2	0.0	1.3	18.0	14.0	5.6	n.a.	29.5	28.0
1960-66	14.6	27.5	15.6	35.0	6.7	15.3	80.0	12.7	24.5	36.5	21.5
1966-73	33.5	38.5	0.0	27.5	7.7	17.5	50.0	20.0	42.0	47.0	14.9
Total Exports											
1953-60	-0.6	-2.8	2.6	-3.4	2.6	19.6	-3.2	3.9	n.a.	2.2	17.2
1960-66	6.7	5.4	10.1	1.5	5.5	15.3	40.0	7.8	28.5	23.5	13.6
1966-73	10.8	19.9	5.3	12.7	7.0	17.0	44.0	8.1	28.5	35.5	13.8
Total Imports											
1953-60	6.7	1.5	5.9	-3.6	9.8	8.5	0.0	5.6	n.a.	6.2	11.1
1960-66	-1.8	0.4	6.9	3.7	5.4	8.8	13.0	6.9	8.0	13.1	11.3
1966-73	10.3	24.5	5.7	6.7	-0.3	20.0	29.0	14.5	25.5	29.5	17.2
Purchasing Power of Exports /a											
1960-66	4.0	4.0	8.8	0.2	4.2	13.0	38.0	6.5	26.5	22.5	12.9
1966-73	4.9	13.5	-0.6	6.7	1.2	10.2	36.5	2.3	21.5	28.5	7.7

a/ Export values deflated by the unit value index of the manufactured goods exports of developed countries.

Sources: National and international trade statistics.

consideration national price indices are not available for the relevant product groups. We have, however, calculated changes in the purchasing power of exports by deflating export values by the unit value index for the manufactured exports of the developed countries (Table 3.1). Data on the value and volume of the traditional primary exports of the individual economies, their shares in the total exports of each economy, and the share of each in the world exports of the commodities in question are provided in Appendix Table 3.2.

Export Trends in Eleven Semi-industrial Economies

The outward-oriented policies of Korea, Singapore, and Taiwan, adopted after the first stage of import substitution, entailed a free-trade regime for exports, with additional incentives for nontraditional exports. On the average, comparable incentives were provided for exports and import substitution, and for primary and manufacturing activities, and considerable stability in incentives was assured over time.

Table 3.2. *Eleven Semi-industrial Economies: Exports, Imports, Manufactured Output, and GNP*
(percent)

	Argentina	Brazil	Chile	Colombia	India	Israel	Korea	Mexico	Singapore	Taiwan	Yugoslavia
Share of Manufactured Exports in Manufactured Output											
1960	0.8	0.4	3.0	0.7	9.7	7.9	0.9	2.6	11.2	8.6	10.8
1966	0.9	1.3	4.1	3.0	9.4	12.8	13.9	2.9	20.1	19.2	13.8
1973	3.6	4.4	2.5	7.5	8.6	14.1	40.5	4.4	42.6	49.9	16.9
Incremental Ratio of Manufactured Exports to Manufactured Output											
1960-66	1.0	3.6	5.5	7.7	8.9	23.9	24.8	3.2	28.4	24.8	15.8
1966-73	6.5	5.6	0.0	11.4	7.7	14.9	45.7	5.5	47.5	56.4	19.5
Share of Manufactured Imports in Total Use of Manufactured Goods											
1960	14.6	10.8	26.3	30.8	19.3	28.5	24.4	19.6	56.2	28.5	22.0
1966	6.3	7.5	21.6	28.0	16.5	32.8	26.5	16.2	53.2	29.3	17.3
1973	5.4	13.0	17.5	21.5	9.5	41.2	35.9	15.2	64.3	38.9	24.0
Incremental Ratio of Manufactured Imports to Use of Manufactured Goods											
1960-66	-3.9	-3.0	14.1	20.5	10.4	42.5	31.9	11.7	49.2	30.5	13.6
1966-73	4.4	15.7	10.8	14.2	-0.4	45.1	40.4	14.4	67.0	42.2	29.4
Ratio of Total Exports to GNP											
1960	8.9	6.1	12.6	11.3	4.2	8.4	1.5	6.4	9.9	9.5	22.4
1966	7.3	7.1	15.7	9.5	4.2	12.8	6.5	5.4	26.6	17.1	14.2
1973	8.1	9.8	7.6	11.8	4.3	15.5	26.1	4.3	44.6	47.8	14.5
Incremental Ratio of Total Exports to GNP											
1960-66	5.3	12.3	23.0	3.4	4.1	20.4	13.0	4.3	52.0	24.7	10.7
1966-73	9.0	11.5	3.3	14.5	4.3	17.4	34.8	3.3	52.0	63.3	14.8
Ratio of Total Imports to GNP											
1960	10.3	7.1	12.9	12.6	7.5	20.1	16.0	9.0	65.4	18.9	32.8
1966	5.2	6.1	13.5	12.6	7.4	21.2	18.7	7.2	62.5	19.9	18.3
1973	5.5	11.1	6.8	10.6	4.5	30.8	34.3	8.6	91.5	40.5	22.0
Incremental Ratio of Imports to GNP											
1960-66	-1.3	0.9	14.9	12.4	7.3	23.0	22.2	5.1	57.9	20.8	12.3
1966-73	6.0	14.2	2.4	8.4	-0.3	37.3	41.3	9.7	103.6	50.8	26.4

Sources: National and international trade statistics and Appendix Table 3.1.

The three Far Eastern economies achieved faster export growth than any other under study. Their early application of outward-oriented policies may explain why in 1960–66 they had the highest incremental export-output ratios in manufacturing. As their export promotion efforts intensified in 1966–73, their incremental export-output ratios increased further: from 13.9 percent to 40.5 percent in Korea, from 20.1 to 42.6 percent in Singapore, and from 19.2 to 49.9 percent in Taiwan (Table 3.2).

The high and increasing share of manufactured exports in total exports did not adversely affect the exports of primary commodities in these three economies. Thus, they showed the best performance in regard to nontraditional primary exports among the eleven economies under study in the periods 1960–66 and 1966–73 (Table 3.1). A partial exception is Singapore, which was surpassed by Brazil and Colombia in the growth of primary exports (chiefly refined petroleum products) between 1966 and 1973.

Korea's primary exports grew faster than those of the other economies in both periods; this growth reflects in large part gains in its silk exports in competition with China and Japan. The volume of Korea's silk exports rose nearly twentyfold between 1960 and 1973 while world silk exports only doubled (Appendix Table 3.1).

Traditional primary exports increased less rapidly in Taiwan. Although its share in the world exports of bananas and tea increased, its market share in rice and sugar declined after the mid-1960s as a consequence of shifts to higher valued crops and acreage limitations in the face of rapidly rising consumption.[32] Singapore does not have any traditional primary exports.

Unlike the first group, the economies in the second group began their export-promoting efforts after import substitution had been extended to capital-intensive intermediate products, durable consumer goods, and machinery. They also differ from the first group in that, with few exceptions, the use of imported inputs was limited to cases in which comparable domestic inputs were not available. Correspondingly, subsidies to value added in exports varied considerably from industry to industry and, on the whole, the bias against exports and in favor of import substitution in the manufacturing sector was reduced but not eliminated. Apart from Colombia and, in the case of some nontraditional products, Brazil, the second group also continued to discriminate against primary exports.

Within this group of Latin American countries, in the 1966–73 period manufactured export growth rates were highest in Brazil and in Argentina, both of which introduced considerable export incentives in the mid-1960s. Apart from the increased use of existing capacity, these incentives encouraged the establishment of new facilities for export production, whereas in the preceding period exports had mostly taken up the slack in domestic production. As a result, between 1966 and 1973 the share of exports in manufactured output rose from 0.9 percent to 3.6 percent in Argentina and from 1.3 percent to 4.4 percent in Brazil.

Colombia, which had started promoting exports at an earlier date, surpassed Argentina and Brazil in regard to both average and incremental export-output ratios in manufacturing. Colombia exported 0.7 percent of its manufacturing output in 1960, 3.0 percent in 1966, and 7.5 percent in 1973.

Mexico's proximity to the United States may in large part explain why 2.9 percent of its manufactured output was exported in 1966. With the subsequent introduction of an export incentive scheme, this share increased to 4.4 percent in 1973. But, given the relatively low level of these incentives, both the rate of growth of manufactured exports and the incremental export-output ratio in manufacturing were lower in Mexico than in the other three countries of the group during 1966–73.

The figures for Mexico cover "domestic" manufactured exports only. Mexico's exports from the border area, which enjoyed a free-trade regime, rose from practically nil in the mid-1960s to US$651 million in 1973, of which US$286 million was value added in Mexico. By comparison, domestic manufactured exports were worth US$740 million in 1973.

Continued discrimination against primary activities may explain the relatively slow growth of Mexico's traditional and nontraditional primary exports. Mexico lost market shares in all its traditional primary exports, with the partial exception of lead. Furthermore, its nontraditional primary exports increased much more slowly than those of the other countries of the group.

With continuing discrimination against its traditional primary exports, Argentina also experienced an erosion in its world market shares in all the products in question. Brazil, too, lost ground in its traditional primary exports, which suffered discrimination, but its selective promotion policies benefited the expansion of meat, sugar, and soybean exports. Finally, Colombia experienced a decline in the world market share of its principal traditional primary export, coffee, but it enjoyed a rapid expansion of nontraditional primary exports, which received substantial subsidies.

Although the countries of the third group, Israel and Yugoslavia, started their export promotion efforts at an early date, they did not accord free-trade status to manufactured exports. In 1966, judged by the share of exports in manufactured output, the two countries surpassed the second group while falling behind the first. But, as their export promotion efforts slackened, the share of exports in manufactured output increased only from 12.8 per-

cent to 14.1 percent in Israel and from 13.8 percent to 16.9 percent in Yugoslavia between 1966 and 1973; at the same time, the incremental export-output ratio declined in Israel and increased relatively little in Yugoslavia.

By 1973 Israel's manufactured exports (US$495 million) had been exceeded by those of Argentina, Brazil, and Singapore, while Yugoslavia (US$2,031 million) had been overtaken by Korea and Taiwan. Nevertheless, the average and the incremental shares of exports in manufactured output continued to be higher in Israel and Yugoslavia than in the countries of the second group. At the same time, since there was no substantial discrimination against traditional primary products, Israel could rapidly expand its exports of citrus fruit and diamonds. Such was not the case in Yugoslavia, however, which lost market shares in its major traditional exports.

As a result of its policies of import substitution during the period considered, India lost ground in textiles, its traditional exports, and was slow to develop new manufactured exports. Correspondingly, its share in the manufactured exports of the eleven economies under consideration declined from 65.4 percent in 1953 to 50.7 percent in 1960, 31.2 percent in 1966, and 10.2 percent in 1973. Meanwhile, the share of exports in India's manufactured output fell from 9.7 percent in 1960 to 9.4 percent in 1966 and 8.6 percent in 1973.

Following earlier increases in the export of wood pulp, paper, and fabricated copper products, Chile's manufactured exports in 1973 were no higher than in 1966. Correspondingly, Chile's share in the combined export of manufactured goods of the eleven economies declined to 0.5 percent in 1973 from 3.0 percent in 1953. Finally, with continued discrimination against primary activities, both India and Chile lost ground in their traditional primary exports, while their nontraditional primary exports expanded relatively slowly.

Government Intervention and the Import-Substitution–Exports Sequence

We have provided evidence that reducing the bias against exportation has contributed to export expansion in the economies under study. It also appears that export growth has been particularly rapid in cases where more or less equal incentives have been provided to exports and to import substitution, as well as to individual export products. The question has been raised, however, whether government intervention in the form of planning or programming may have played a role in inducing firms to export. This question is taken up here with further consideration of the sequencing of import substitution and exports.

Few of the successful exporting economies prepared medium-term plans during the period studied. Medium-term plans that were prepared seem to have had only a minimal influence on resource allocation and on the composition of exports. The plans were formulated on an aggregate level, and there was no direct link to exports of specific commodities.

Among the eleven economies studied, only Korea used export targets for individual firms. At the same time, the application of a free-trade regime to exports was in no way related to the fulfillment or the nonfulfillment of these targets.[33] Preferential export credits were also provided according to predetermined rules, and wastage allowances were set for each product rather than for each firm. The fulfillment of export targets thus did not affect the firm's access to export incentives, although successful Korean exporters reportedly enjoyed advantageous treatment in pending tax cases, and, in a few instances, wastage allowances were negotiated between the government and industry representatives simultaneously with export targets. While the existence of export targets may have exerted pressure on some firms, most firms continued to exceed their targets. A case in point is the increase of Korean exports by two thirds between the second quarter of 1975 and the second quarter of 1976, exceeding expectations by a very large margin.

There were no export targets in Hong Kong, Singapore, and Taiwan, all of which had an export performance comparable to that of Korea. And export targets hardly played a role in the expansion of exports in the Latin American countries of the second group, where export obligations were imposed on firms in only a few cases (such as automobiles in Mexico). Nor has the government intervened in the exporting decisions taken by firms in Israel and Yugoslavia.

It follows that, in the economies under consideration, exporting decisions were generally made by the firms themselves. This conclusion is hardly surprising in view of the considerable flexibility that exporters require if they are to respond to world market conditions. Nor can the government take responsibility for success and failure in exporting, which will affect the profitability of the firm. Among socialist countries, such considerations led the government of Hungary to give firms considerable freedom to determine the product composition of their exports following the 1968 economic reform and, in particular, after 1977.[34]

The question is whether an import-substitution phase is necessary for the subsequent expansion of exports and, if so, for how long and at what cost. The experience of Hong Kong indicates that exports may expand rapidly without a previous import-substitution phase. But with the increased sophistication of its industrial struc-

ture brought about by the expansion of exports, "natural" import substitution has taken place in Hong Kong in several industries under free-trade conditions.[35]

It is also noteworthy that the import-substitution phase in nondurable consumer goods and their inputs was of short duration in the first group. Indeed, the bulk of the present exports—including plywood, wigs, synthetic textiles, electronics, and ships—did not pass through an import-substitution phase. Finally, these economies have used largely production subsidies to provide for the parallel expansion of exports and import substitution in the case of machinery, for which reliance on import substitution alone would not have permitted the exploitation of economies of scale and would have raised costs for user industries.

It has been suggested, however, that in Latin America exports would not have expanded at the rates observed without the preceding import-substitution phase. In this connection, several comments are in order. It should first be recognized that in this second group the rapid expansion of exports began from a small base and that the absolute value of manufactured exports and share of exports in manufactured output remained relatively low. It may be conjectured that the establishment of high-cost firms and the lack of sufficient specialization in the production of parts, components, and accessories behind high protection retarded the development of exports. A particular obstacle to export expansion was the lack of efficient industries producing inputs for export production, given the widespread prohibitions on imports of inputs with domestic substitutes.

During the import-substitution phase in Latin American countries, productivity also rose less rapidly than in developed countries. It would appear, then, that import substitution behind high protection has been a negative rather than a positive force in the subsequent development of Latin American exports. This is not to say that the manufacturing industries of developing countries do not need preferential treatment in relation to primary activities. But such treatment should be provided irrespective of whether sales take place in domestic or in export markets so as to avoid the establishment of firms producing exclusively for the domestic market on a small scale, and it should be granted at rates not exceeding those dictated by consideration of social profitability. The desirable structure of incentives will be examined in Chapter 4.

Development Strategies and Economic Performance

The first "easy" stage of import substitution involves the replacement of the imports of nondurable consumer goods and their inputs by domestic production. This stage may not entail substantial economic costs since the industries in question employ chiefly unskilled and semiskilled labor, which is available in abundance in most developing countries. Furthermore, the industries do not require sophisticated technology and large investments per unit of output, and they need few inputs from ancillary industries. Finally, they are not severely handicapped by the limited size of national markets, since the efficient scale of their operations is relatively low and costs are not substantially higher in smaller plants.

The Cost of Protection under an Inward-Oriented Strategy

Once the easy stage of import substitution is passed, replacing imports with domestic production will entail rising costs. This is because the products to be replaced at the next stage, in particular various intermediate products and durable producer and consumer goods, have higher technological and skill requirements, are relatively capital intensive, and need materials, parts, and components from other industries. Also, large-scale economies are of importance in these industries, and unit costs are substantially higher at lower output levels.

In this connection, note may be taken of the relative capital intensity of various industries. On the basis of data for the United States, it has been estimated that capital-labor ratios, expressed in thousands of U.S. dollars per worker, range from 2.0 in apparel and other textile products, 4.5 in furniture and fixtures, and 5.9 in leather and leather products, to 32.9 in primary metals, 41.4 in chemicals, 57.6 in paper and allied products, and 126.1 in petroleum and coal products. Human capital per worker, measured as the discounted value of the difference between the average wage in the particular industry and the unskilled wage, again expressed in thousands of U.S. dollars, has been estimated at 12.0, 21.7, and 17.3 in the first group of industries and 30.1, 33.0, 40.1, and 65.6 in the second.[36]

Given the relative scarcity of physical and human capital in developing countries, these data point to the existence of substantial costs associated with second-stage import substitution. Possible magnitudes of the economic cost of misallocation owing to protection may be indicated for the case of a hypothetical developing country, where unskilled wages are one third of U.S. unskilled wages and the cost of capital is commensurately higher. From the data on capital-output ratios referred to above, it has been estimated that the average cost of production in seven capital-intensive commodity categories is 15 to 32 percent higher, and that in seven labor-intensive categories 38 to 52 percent lower in such a developing country than it is in the United States. The

ratios of the cost estimates for these capital- and labor-intensive products indicate that relative costs for individual commodity categories in the two countries range from 1.86 to 2.75.[37]

These results assume that cost differences are due only to differences in the relative prices of capital and labor between developed and developing countries. Yet, higher costs in countries pursuing policies that favor import substitution and that discriminate against exports may also be due to the constraints on production techniques imposed by the small size of national markets. Thus, in the presence of economies of scale, producers have the choice between small-scale operations or building ahead of demand, both of which involve excess costs.

Technical studies have shown that economies of scale can be substantial in a variety of second-stage import-substitution industries, especially in so-called process industries, including the manufacture of petrochemical, chemical, and metal products, where a doubling of output tends to be accompanied by a 20 to 30 percent decline in unit costs.[38] The cost reductions that could be obtained through the freeing of tariff barriers in semi-industrial developing countries are also indicated by the results of a study of Latin America for the 1960s. For the six commodities investigated, the elimination of tariffs within the area was estimated to entail cost savings of 10 to 20 percent.[39]

These results relate to cost reductions owing to increases in the output of particular products. Further gains may be obtained through reductions of product variety (horizontal specialization) in individual firms and the establishment of ancillary industries to produce parts, components, accessories, and various services (vertical specialization). Horizontal specialization has been the subject of empirical studies in the aircraft, machine tool, and shipbuilding industries. The gains from vertical specialization are more difficult to quantify, although an interesting effort has been made by Rocca.[40] He has found that about 50 percent of the interstate differences in labor productivity in Brazil are explained by differences in the size of the manufacturing sector, with the remainder owing to differences in capital per worker and in plant scale. The size of the manufacturing sector has been taken to reflect the external economies obtainable through the existence of ancillary industries.

Furthermore, given the limited size of national markets in developing countries, monopolistic and oligopolistic market structures are created that may lead to X-inefficiencies, with actual costs exceeding "best practice" costs for given plant size and factor prices because there is little incentive for efficient operations. X-inefficiencies, together with inefficiencies in the allocation of resources among industries, small-scale operations, and the lack of full capacity utilization, contribute to the cost of protection in countries that continue with import substitution in the second stage.

Among the economies studied, the costs of protection, including those of monopoly profits that could not be distinguished in the calculations, have been estimated at 7.1 percent of GNP in 1966 in Brazil[41] and 6.2 percent in 1961 in Chile.[42] Comparable results have been obtained by Krueger for Turkey, another country characterized by continuing import substitution behind high protection.[43] Extrapolating to the whole of Turkey's manufacturing sector the results obtained for a sample of manufactured industries, Krueger suggested that the world market value of Turkish manufacturing output might be doubled if trade were freed and resources reallocated from import-substituting to export industries. With manufacturing industries accounting for one seventh of its GNP in domestic prices,[44] this is equivalent to a cost of protection of 7 percent of Turkey's GNP.

The above results have been derived in a partial equilibrium framework. To analyze the relationship between the height of tariffs and the cost of protection and to indicate the implications of the dispersion of tariffs, a general equilibrium framework would need to be employed. The use of such a framework would also permit one to take account of the interactions among production activities that operate through factor prices and the exchange rate.

In a two-commodity general equilibrium model, Johnson has shown that the cost of protection rises more than proportionately with the rate of the tariff.[45] Under the assumptions that the two goods are consumed in equal quantities under free trade, that the elasticity of substitution in consumption is 1, and that the price elasticity of supply of the importable good is 1.5, Johnson has estimated that the cost of protection, expressed as a proportion of GNP, would increase from 1.6 to 9.8 percent, and again to 19.1 percent, as the tariff on the importable was raised from 20, to 60, to 100 percent.

Johnson's results have been confirmed by Nugent, who has further shown that the dispersion of tariffs and the cost of protection are positively correlated.[46] Nugent's model contains three commodities consumed in equal quantities under free trade, and assumes the same elasticity values as are assumed in Johnson's study. The results show that the cost of protection would rise from 12.0 to 15.7 percent of GNP if the two protected goods had tariffs of 20 and 100 percent, averaging 60 percent, rather than if there were a 60 percent tariff on each.

Finally, using an earlier version of the effective protection estimates presented in Chapter 6 of this volume, de Melo has estimated the cost of protection in a general equilibrium model for Colombia.[47] On the assumption

that land reallocation within agriculture is not possible and that an optimal tax is imposed on coffee, the cost of protection has been estimated at 11.0 percent of GNP if labor is assumed to be fully employed and at 15.8 percent of GNP if additional supplies of labor are available at a constant real wage.[48] The difference between the two results indicates the importance of the employment effect, which was not considered in earlier estimates of the cost of protection.

High protection may also have adverse effects on economic growth through the transfer of factors to protected industries in the process of factor accumulation. Johnson has shown that in a country that faces given world market prices and protects capital-intensive commodities, increases in the capital stock may lead to a fall in real incomes through the transfer of labor from high-productivity to low-productivity industries.[49] And, though the conditions for such "immiserization through capital accumulation"[50] may not be fulfilled, the growth of productivity would nevertheless be adversely affected.

These propositions are supported by estimates of total factor productivity that express the rate of growth of the productivity of primary factors combined. For 1955–64 the growth of total factor productivity has been estimated by Bruton at −0.6 percent a year in Argentina, 1.4 percent a year in Brazil, and 0.5 percent a year in Chile.[51] Even if Argentina's experience is unusual, it would take an economy a long period to recoup the cost of protection through increases in total factor productivity.

At any rate, to reduce the economic distance separating developed and developing countries, it will not suffice to recoup the cost of protection if in the meantime total factor productivity has been rising in developed countries as a result of technological change. Bruton has also found that total factor productivity tends to rise more rapidly in developed countries than in developing countries that continue with import substitution behind high protection. Thus, rather than narrowing it, protection appears to have contributed to the widening of the economic distance between developed countries and developing countries that continued to follow an inward-oriented strategy.

Apart from its unfavorable effects on the growth of factor productivity, protection will adversely affect the rate of growth of GNP through its effect on savings. Consider, for example, the case in which capital is the only scarce factor of production, the incremental capital-output ratio is 3, the average savings ratio is 15 percent, and the marginal savings ratio is 30 percent. A cost of protection amounting to 6 percent of GNP would lower the rate of economic growth from 5 to 4.4 percent by reducing the amount saved. And, if population is growing at an annual average rate of 3 percent, the potential increase in per capita income will be reduced by more than one fourth. While these effects work through income changes owing to protection, growth is further reduced to the extent that savings from a given income are lower under import-substitution policies than under export promotion.

Development Strategies and Economic Growth

Continued import substitution behind high protection involves "traveling up the staircase" by undertaking the production of commodities that involve increasingly higher domestic costs per unit of foreign exchange saved. By contrast, exporting involves "extending a lower step on the staircase" by increasing the production of commodities in which the country has a comparative advantage, which thus entail lower domestic costs per unit of foreign exchange earned. Exportation may further permit a higher degree of capacity utilization and the exploitation of economies of scale, which also benefit domestic users through lower prices.

Exports may also lead to increases in output elsewhere in the economy. To the extent that the stimulus of export expansion is larger than that of import substitution, the multiplier effects of export production, operating through input-output relations and income changes, will also be larger when labor and capital resources are not fully utilized. Furthermore, resource allocation according to comparative advantage, greater capacity utilization, and the exploitation of economies of scale lead to savings in capital that may, in turn, be used to increase employment in countries where labor is not fully employed. Finally, export expansion may contribute to the growth of the national economy by easing the foreign exchange bottleneck that has often been an obstacle to economic growth in developing countries.

These results may be obtained under policies that provide similar incentives to exports and to import substitution and that entail little discrimination among industries. Apart from the once-for-all gains described above, such policies may provide a continuing stimulus to economic growth through technological change that is undertaken in response to competition abroad, increased savings, and the more efficient use of increments in factor supplies.

The possible effects on economic growth of the policies actually followed have been examined empirically for the eleven economies studied by taking the growth rate of exports as a proxy for policy orientation—that is, the choice made between using resources in export activities rather than in import substitution under protection. Other things being equal, different rates of export

Table 3.3. *Eleven Semi-industrial Economies: Economic Growth*
(average annual percentage growth rate)

	Argentina	Brazil	Chile	Colombia	India	Israel	Korea	Mexico	Singapore	Taiwan	Yugoslavia
Value Added in Agriculture											
1953–60	0.5	4.0	-0.3	3.3	2.5	10.0	2.3	5.7	n.a.	3.9	3.5
1960–66	3.2	3.8	2.7	2.7	-0.5	2.6	5.8	4.7	2.5	5.3	3.2
1966–73	0.7	5.9	-0.7	4.7	3.0	5.6	3.2	2.4	3.1	3.8	2.0
Manufacturing											
1953–60	5.8	10.1	2.8	6.6	4.8	10.3	13.6	8.5	n.a.	10.1	13.2
1960–66	5.3	4.5	7.2	5.7	6.2	8.0	13.0	9.7	10.3	12.3	9.9
1966–73	7.3	11.8	3.7	7.6	4.7	10.9	21.0	7.6	15.0	22.0	8.4
Gross National Product											
1953–60	3.2	6.3	2.8	4.3	3.5	10.0	5.6	6.5	n.a.	6.9	5.6
1960–66	3.6	4.1	5.1	4.7	2.8	8.4	7.3	7.1	7.3	9.4	5.8
1966–73	4.8	9.3	2.4	6.1	3.8	9.8	10.7	6.4	12.7	10.7	7.1
Per Capita GNP											
1953–60	1.2	3.4	0.4	1.3	1.6	4.8	3.0	2.8	n.a.	3.2	4.4
1960–66	2.1	1.1	2.6	1.5	0.5	4.5	4.5	3.7	4.5	6.2	4.8
1966–73	3.3	6.4	0.2	2.9	1.5	7.0	8.8	2.9	10.9	7.9	6.0
Population											
1953–60	2.0	2.9	2.4	3.0	1.9	5.3	2.7	2.9	4.8	3.6	1.2
1960–66	1.5	2.9	2.6	3.3	2.3	3.9	2.7	3.4	2.8	3.2	1.0
1966–73	1.5	2.9	2.2	3.2	2.3	2.8	1.9	3.4	1.8	2.8	1.0

Sources: United Nations, Yearbook of National Accounts Statistics, various issues; Organisation for Economic Co-operation and Development (OECD), National Accounts of Less-Developed Countries, 1950–66 (Paris, 1970); and World Bank, World Tables, 1976 (Baltimore, Md.: Johns Hopkins University Press, 1976).

growth will be associated with differences in trade policies.[52]

In addition, we have examined the relationship between exports and the growth of output *net* of exports. In an intercountry context, the correlation between these variables reflects the indirect effects of exports on input-output relations and real incomes. In turn, the correlation between exports and output growth will indicate the total (direct plus indirect) effects of exports on economic growth.

In view of the changes in incentives around 1966 in several of the economies under consideration, calculations have been made for 1960–66 and 1966–73, as well as for the two periods combined. We consider first the estimates for manufactured goods, second, the results pertaining to the economy as a whole, and third the implications for economic growth of intercountry differences in savings ratios and in the growth of the labor force.

Estimates for the Manufacturing Sector

The data for the eleven economies under consideration indicate a positive correlation between exports and output growth in the manufacturing sector. In 1960–66 Korea, Singapore, Taiwan, Israel, and Yugoslavia had the highest incremental export-output ratios as well as the highest growth rates of manufacturing output,[53] while Argentina and Brazil had the lowest incremental ratios and growth rates (Tables 3.2 and 3.3). For the eleven economies as a group, the Spearman rank correlation coefficient between the incremental export-output ratio and the rate of growth of value added in manufacturing is 0.87 (Table 3.4).[54]

In examining the data for the period 1960–66, we have emphasized incremental ratios since growth rates of manufactured exports were affected to a considerable extent by absolute values in the initial year. This fact may explain the low correlation between the growth of

Table 3.4. *Eleven Semi-industrial Economies: Spearman Rank Correlation Coefficients between Exports and Output Growth*

	Manufacturing			Total		
	1960-66	1966-73	1960-73	1960-66	1966-73	1960-73
Export Growth vs. the Growth of Output	0.400 (0.112)	0.846 (0.001)	0.709 (0.008)	0.822 (0.001)	0.934 (0.001)	0.888 (0.001)
Export Growth vs. the Growth of Output Net of Exports	0.178 (0.301)	0.800 (0.002)	0.738 (0.005)	0.482 (0.067)	0.765 (0.004)	0.770 (0.003)
Incremental Export/ Output Ratios vs. the Growth of Output	0.873 (0.001)	0.682 (0.011)	0.809 (0.002)	0.708 (0.008)	0.847 (0.001)	0.813 (0.002)
Incremental Export-Output Ratios vs. the Growth of Output Net of Exports	0.251 (0.229)	0.709 (0.008)	0.800 (0.002)	0.036 (0.458)	0.688 (0.010)	0.582 (0.031)

Note: Manufacturing exports have been related to the output of the manufacturing sector and total exports to GNP. Levels of significance are shown in parentheses.

exports and value added in manufacturing (0.40) during this period.

Growth rates of manufactured exports are more meaningful indicators of export performance in 1966–73, when the volume of exports in the initial year was already substantial. The Spearman rank correlation coefficient between the growth of exports and that of value added in manufacturing in this period was 0.85; the coefficient was 0.68 between incremental export-output ratios and growth of the manufacturing sector. These results are little affected if we exclude the direct effects of exports by deducting export values from the value of manufactured output. The corresponding Spearman rank correlation coefficients were 0.80 for export growth and 0.71 for incremental export-output ratios.

The data for the individual economies also show the effects of policy changes after 1966. With increased export orientation, the rate of growth of value added in manufacturing rose further in Korea, Singapore, and Taiwan. As Yugoslavia slackened its export promotion efforts, it dropped out of the lead group and, like Chile and India, which continued with import substitution, experienced a decline in the growth of its manufacturing sector. Finally, the acceleration in the growth of manufacturing was particularly marked in Brazil, where the shift to export promotion was most pronounced.

Export orientation in manufacturing has also had favorable effects by saving capital. To begin with, an export-oriented strategy permits developing countries to exploit their comparative advantage, which tends to lie in labor-intensive industries within the manufacturing sector. Increased capacity utilization through exports will lead to higher output without necessitating increases in the capital stock. Moreover, exploiting economies of scale reduces capital costs per unit of output.

Savings in capital resulting from the expansion of manufacturing exports are indicated in the study on Korea (Chapter 8). According to the estimates cited there, the average capacity utilization rate in the manufacturing sector, defined in terms of electricity use and with three-shift operations as the norm, rose from 17.7 percent in 1962 to 31.9 percent in 1971. In the manufacturing sector, capital-labor ratios were much lower for

exports than for import substitution, with average capital-labor ratios for the direct factor requirements of the manufacturing sector, in thousand won per man-year at 1965 prices, estimated at 282 for exports, 429 for imports, and 379 for domestic manufacturing output in 1968. These compare with capital-labor ratios of 368, 478, and 337, respectively, in 1960.[55] The differences among them reportedly declined after 1968. In Taiwan, too, export industries were much more labor-intensive than the average, with the differences increasing over time (see Table 10.20).

Labor requirements per unit of output were about 40 percent higher for manufactured exports than for imports in Brazil, and differences of a similar magnitude are shown for Colombia.[56] Although comparable data on capital inputs are not available for these countries, we can assume that in the case of equal profitability across industries capital coefficients would be higher for imports than for exports.

Economywide Estimates

The influences described in regard to the manufacturing sector also operate economywide. Output growth, for example, is positively correlated with exports in primary activities as well as in manufacturing. For the group of eleven, the Spearman rank correlation coefficient between the growth of agricultural exports and that of value added in agriculture was 0.57 for 1960–66 and 0.71 for 1966–73. While the results are influenced by the effects of the weather and other exogenous factors on crop yields, the previous discussion suggests that the incentive policies applied affected agricultural output through their impact on exports.

Other indirect effects of export expansion operate through intersectoral relationships. Manufacturing activities use raw materials as inputs while primary producers purchase manufactured inputs and machinery, and the higher incomes resulting from the expansion of exports, whether primary or manufactured, increase demand for consumer goods. Finally, by increasing foreign exchange earnings, export expansion may contribute to the growth of the national economy by easing the foreign exchange bottleneck.

The effects of increased export earnings can be seen in the continued rise of the share of imports in the gross national product in Israel, Korea, Singapore, and Taiwan, and in the reversal of the decline in this share in Argentina, Brazil, Mexico, and Yugoslavia (Table 3.2). By contrast, import shares declined to a considerable extent between 1966 and 1973 in both Chile and India. For the sample group as a whole, the Spearman rank correlation coefficient between incremental import-GNP ratios and the growth of GNP was 0.91 in the years 1966–73.

The described influences are expected to lead to a positive relation between export expansion and the growth of GNP. The results for the economies under study tend to conform to these expectations. Between 1966 and 1973, economic growth in the eleven developing economies was closely linked with export growth, except that the inflow of foreign private capital enabled Mexico to reach a higher rate of growth of GNP than would have been expected on the basis of export figures. The relation was somewhat weaker during 1960–66, when the exports of several of the economies concerned began growing from a small base. For the entire sample, the Spearman rank correlation coefficient between the growth of exports and that of GNP was 0.82 for 1960–66 and 0.93 for 1966–73 (Table 3.4). The estimated results are hardly affected if the rate of growth of exports is replaced by the incremental export-GNP ratio. For the whole group, the Spearman rank correlation coefficient between incremental export-GNP ratios and the rate of growth of GNP was 0.71 for 1960–66 and 0.85 for 1966–73.[57]

A somewhat weaker relationship is indicated for the indirect—as compared with the total—effects of exports. This is explained by the fact that calculating indirect effects involves deducting the *value* of exports from GNP, which is a *value added* concept. Nevertheless, the results obtained for 1966–73, as well as for the period 1960–73 as a whole, point to the importance of the indirect effects of exports. Thus, for 1966–73 the Spearman rank correlation coefficient between export growth and the growth of GNP net of exports was 0.77, and that between incremental export-output ratios and the growth of GNP net of exports was 0.69. The corresponding coefficients were 0.77 and 0.58 for the period 1960–73 as a whole.

Adjusting for Factor Inputs

Explaining GNP growth in terms of export growth has the disadvantage of omitting other variables that affect intercountry differences in GNP growth rates. Michalopoulos and Jay have endeavored to remedy this deficiency by using domestic and foreign investment and labor as explanatory variables together with exports in an intercountry regression designed to explain differences in GNP growth rates.[58] The inclusion of exports in a production function type of relation reflects the assumption that exports tend to raise total factor productivity for the reasons indicated above. Using data for thirty-nine developing countries in 1960–66, Michalopoulos and Jay have found that intercountry differences in

domestic and in foreign investment and in labor force growth explained 53 percent of the intercountry variation in GNP growth rates, while adding an export variable raised the coefficient of determination to 0.71. These results are reproduced in equations (l) and (2) of Table 3.5.

We have applied the method used by Michalopoulos and Jay to the pooled data of ten of the eleven economies under study for 1960–66 and 1966–73; for lack of some of the relevant data, Singapore had to be excluded.[59] The results shown in equations (3) and (4) indicate that adding the export variable to the regression equation raises the coefficient of determination from 0.58 to 0.77. At the same time, all regression coefficients are significant at the 5 percent level in both equations.

The regression coefficient of the export variable has the same value as in the Michalopoulos-Jay equation, indicating that a 1 percent increase in the rate of growth of exports is associated with a 0.04 percent increase in the rate of growth of GNP. In turn, the coefficients of the foreign capital and the labor variables are higher than in the earlier study, and the coefficient of domestic capital is lower. The latter result may be explained by the fact that in most of the ten economies included in the regression analysis, domestic investment was rising rapidly during the period under consideration and its effects were not yet fully absorbed in the economy.

As shown in equations (5) and (6), the results are not substantially affected if the current dollar value of exports is replaced by a measure of the purchasing power of exports or by the incremental export-GNP ratio. In the latter case, a 1 percent increase in the rate of growth of exports appears to be associated with a 0.05 percent increase in the rate of growth of GNP.

The results obtained for the relationship between export and GNP growth may be compared with the estimate derived in a cross-sectional investigation of a partly overlapping group of ten economies by Krueger. She has found that an annual increase in the rate of growth of exports tends to raise the rate of growth of GNP by 0.11 percent.[60] While Krueger's estimates reflect an adjustment for a time trend, no adjustment has been made for changes in labor and capital.

The Implications of the Results

The next question concerns the implications of intercountry differences in export performance on the rate of economic growth. For this purpose, we have compared predicted GNP growth rates derived from equation (4) on the basis of *actual* export growth rates for the individual economies with hypothetical GNP growth rates derived from the same equation on the assumption that each economy had the *average* export growth rate estimated for the group as a whole. The calculations have been made for 1966–73.

According to the results shown in Table 3.6, the increase in Korea's GNP would have been 37 percent smaller if its exports had grown at the average rate of the economies concerned. The corresponding proportion is 25 percent for Taiwan. At the other extreme, in Chile and India the increase in GNP would have been 14 and 12 percent greater respectively, if these countries had had average export growth rates. The corresponding estimates for the remaining members of the group fall between −6 and +8 percent.

The differences are accentuated if the results are expressed in per capita terms. Thus, according to the calculations, increases in per capita income in Korea would have been 43 percent smaller and in Taiwan 33 percent smaller, if their export growth rates had been identical to the average for the sample as a whole. Increases in per capita incomes in Chile and India, respectively, would have been 21 and 22 percent higher.

As noted earlier, export growth rates are sensitive to the choice of the base year. This is particularly the case in Brazil, where exports in 1966 were at a low level owing to the adverse effects of inward-looking strategies. Correspondingly, we have also made estimates using ratios of incremental exports to incremental GNP. As shown in Table 3.6, the results by and large correspond to the estimates derived using export growth rates.

These results point to the fact that trade orientation has been an important factor contributing to intercountry differences in the growth of incomes. It is further apparent that income increments have been achieved with substantially less capital investment when governments have followed a consistent policy of export orientation. Thus, for the 1960–73 period as a whole, incremental capital-output ratios were 1.76 in Singapore, 2.10 in Korea, and 2.44 in Taiwan. At the other extreme, these ratios were 5.49 in Chile and 5.72 in India.[61]

During the same period, incremental capital-output ratios were between 3 and 5 in the remaining economies of the sample, with improvements shown over time in those with increased export orientation. While figures for subperiods are subject to considerable error, it appears that the greatest improvement took place in Brazil following its pronounced policy change. Brazil's incremental capital-output ratio declined from 3.84 in 1960–66 to 2.06 in 1966–73. The low figure for the second period largely reflects the increased use of capacity at higher export levels.[62]

In indicating that export growth favorably affects the

Table 3.5. *Intercountry Regression Analysis of the Growth of GNP*

Equation No.	Dependent Variable	Coefficients of Independent Variables						
		K_D	K_F	L	X	PPX	IXR	R^2
Michalopoulos and Jay								
1	GNP	0.25 (7.81)	0.20 (3.35)	0.66 (2.44)				0.53
2	GNP	0.24 (9.62)	0.12 (2.33)	0.60 (2.81)	0.04 (4.82)			0.71
Balassa								
3	GNP	0.18 (3.23)	0.30 (2.42)	1.09 (1.74)				0.58
4	GNP	0.15 (3.33)	0.23 (2.40)	0.97 (1.99)	0.04 (3.57)			0.77
5	GNP	0.16 (3.59)	0.24 (2.44)	0.92 (1.82)		0.05 (3.34)		0.75
6	GNP	0.14 (2.32)	0.26 (2.32)	0.98 (1.66)			0.006 (1.86)	0.65

Note: Eqs. (1) and (2) have been taken from Michalopoulos and Jay (1973) and refer to the period 1960-66. Eqs. (3) to (6) have been estimated for the pooled data of ten economies for 1960-66 and 1966-73. Growth rates of the gross national product (GNP) and labor force (L) have been expressed as the absolute change between the initial and the terminal year, divided by initial year values. The same procedure has been followed for growth rates of exports, which have alternatively been expressed in terms of current dollar values (X) and in terms of their purchasing power (PPX), derived by deflating their dollar values by the index of unit values of manufactured exports of the developed countries. IXR is the incremental export/GNP ratio as defined in the text. K_F is the average current balance during the period in question, expressed as a proportion of initial year GNP, and K_D is the average difference between gross fixed capital formation and current account balance, expressed as a proportion of initial year GNP. Data on labor refer to the labor force rather than employment.

Sources: C. Michalopoulos and K. Jay, "Growth of Exports and Income in the Developing World: A Neoclassical View," AID Discussion Paper no. 28 (Washington, D.C.: Agency for International Development, 1973); and World Bank, World Tables, 1976.

Table 3.6. *Ten Semi-industrial Economies: Hypothetical Gain or Loss in the Growth Rates of GNP and per Capita GNP, on the Assumption of Average Export Growth Rates and Incremental Export-GNP Ratios, 1966–73*

	Export Growth		Incremental Export-GNP Ratio	
	GNP	Per Capita GNP	GNP	Per Capita GNP
Argentina	+ 8.4	+11.9	+ 5.0	+ 7.0
Brazil	- 5.3	- 8.8	+ 0.8	+ 1.3
Chile	+13.7	+21.4	+11.9	+18.3
Colombia	+ 3.8	+ 7.0	- 2.2	- 3.7
India	+12.4	+21.8	+11.2	+20.2
Israel	- 0.8	- 1.2	- 3.4	- 4.8
Korea	-37.4	-42.5	-15.5	-18.3
Mexico	+ 8.4	+17.1	+ 9.9	+20.6
Taiwan	-25.1	-32.6	-31.3	-40.2
Yugoslavia	+ 2.8	+ 3.3	- 3.0	- 3.5

Note: Hypothetical growth rates have been calculated from eqs. (4) and (6) in Table 3.5, under the assumption that the economy in question had the average growth rate of exports or average incremental export-GNP ratio calculated for the sample as a whole. The difference between these hypothetical growth rates and the growth rates predicted from the same equations for the economy concerned has been designated as the gain (+) or loss (-) in the growth rate of GNP and per capita GNP, compared with the average export growth and incremental export-GNP ratios.

rate of economic growth over and above the contributions of domestic and foreign capital and labor, the estimates in Table 3.6 provide evidence on the benefits of outward orientation compared with inward orientation. At the same time, the empirical results tend to underestimate the effects of export growth on the growth of GNP, since no account is taken of the implications of export growth for the other variables included in the equation. Yet, as noted above, trade policy may greatly affect savings and investment.

One result will be an income effect as export-oriented growth leads to increased savings at higher income levels. Also, as Corden notes, to the extent that investment goods fall in price following the adoption of an outward-oriented strategy, a substitution effect will operate in favor of capital accumulation.[63] Using a general equilibrium model, de Melo and Dervis have found that such a substitution effect has indeed reinforced the income effect of export growth on domestic savings in Turkey.[64]

Domestic savings would also increase if a higher than average share of the incomes generated by exports were saved. This proposition has received support from a cross-country study of seventeen developing countries by Weisskopf, who has found a positive correlation between exports and domestic savings.[65] Weisskopf's results have been confirmed by Papanek in a cross-sectional analysis of thirty-four developing countries for the 1950s, and of fifty-one developing countries for the 1960s.[66]

A positive correlation between exports and domestic savings has also been found in a time-series analysis of

four developed and eight developing countries by Maizels for the early post–World War II period extending to 1962.[67] Maizels's sample includes India; for the same country Bhagwati and Srinivasan have obtained inconclusive results in a comparative study of ten industries for the 1950s and 1960s.[68] Given India's orientation toward import substitution during the entire period, however, the lack of clear-cut results in an interindustry framework should not modify the cross-sectional and time-series results obtained for a large number of developing countries cited above.

As export expansion improves the balance of payments, a country may become more attractive to foreign investors. While Weisskopf and Papanek have found a negative correlation between domestic and foreign savings, Grinols and Bhagwati have brought into question the validity of these results.[69] Also, on the basis of the experience of the countries included in the NBER project, Bhagwati has concluded that a "substantial inflow of foreign capital seems to attend such a strategy [of export promotion (EP) and that] this inflow is *not* exogenous to the EP strategy, as is sometimes assumed, but can be seriously argued to be a result in large part of the EP strategy itself."[70]

The above discussion of the relation between exports and economic growth has been based on cross-sectional analysis. Data on changes over time in export values and in the GNP of the individual economies tend to confirm the conclusions derived from the cross-sectional results. Thus, with one exception, in economies where the rate of growth of exports increased in 1960–66 and 1966–73, economic growth also accelerated. In Chile, meanwhile, the decline in the rate of growth of exports was accompanied by a slowdown in the growth of the national economy.

Employment and Income Distribution

In developing countries where labor is not fully employed, employment will benefit from the rapid growth of manufacturing output associated with export expansion and from the relative labor intensity of exports.[71] Employment gains will be reduced, however, to the extent that export orientation leads to more rapid increases in labor productivity than would otherwise be the case. The resulting net increases in employment as well as changes in factor pricing resulting from the application of outward-oriented policies will, in turn, influence the distribution of income. These effects are discussed here with reference to the experience of individual economies.

Banerji and Riedel have analyzed factors affecting manufacturing employment in India and Taiwan.[72] Their results indicate that in Taiwan the favorable effects of output growth on employment were enhanced by structural change through a shift toward labor-intensive export activities, whereas in India the shift toward capital-intensive import substitution and exports aggravated the effects of slow output growth. In turn, productivity growth was somewhat more rapid in Taiwan than in India.

In 1961–71, employment in Taiwan's manufacturing increased at an average annual rate of 10 percent. This growth rate can be decomposed into: the effects of the growth of manufacturing output of 18 percent; a 4 percent rise in demand for labor, caused by a structural shift toward labor-intensive industries; a 4 percent fall in demand for labor, owing to productivity growth; and the cross-effects of these changes, which reduced the demand for labor by 8 percent. The corresponding estimates for India in 1960–69, when manufacturing employment increased at an average annual rate of 3 percent, are 11 percent for the effect of output growth; −1 percent for structural change; −3 percent for productivity change; and −4 percent for their cross-effects.[73]

With the slow growth of demand for labor, the manufacturing sector contributed little to alleviating the unemployment situation in India. Between 1961 and 1973 unemployment increased from 11.7 percent to 28.8 percent of the labor force in the organized sector—defined to include all establishments in the public sector and nonagricultural establishments employing more than ten workers. During the same period, unemployment in Taiwan fell from 5.3 to 1.3 percent of the total labor force.[74] Unemployment also declined in Korea, where national statistics show manufacturing employment to have grown at an average annual rate of 12 percent between 1960 and 1973.

Along with the decline in unemployment, real wages increased considerably in cases where exports expanded rapidly. This increase reflects the fact that the rate of growth of the demand for labor on the part of the manufacturing sector exceeded the rate of growth of the supply of labor to this sector. As a result, between 1966 and 1973, real wages in manufacturing rose at an average annual rate of 11 percent in Korea and 5 percent in Taiwan. In Brazil real wages in manufacturing rose 4 percent a year after the increased orientation toward exports. By contrast, a decline of 1 percent a year was experienced in Chile and in India.[75]

In the two cases where export promotion began earliest and was the most far-reaching, income inequalities were reduced. The Gini coefficient declined from 0.37 in 1964 to 0.35 in 1970 in Korea, and from 0.33 in 1964 to 0.31 in 1973 in Taiwan.[76] In Korea between 1964 and 1972 the incomes of the poorest 60 percent of the population grew 40 percent faster than the national average.[77]

It should be emphasized that in cases when the ap-

plication of outward-oriented policies has led to rapid economic growth, even modest advances in the rate of income growth of the poor over the national average have been associated with rapid increases in their absolute incomes. It is instructive to compare the experience of Korea with that of Sri Lanka, where the relative position of the poor was improved at the expense of slower economic growth under an inward-looking strategy. Thus, Ahluwalia, Carter, and Chenery show that in 1958–60 the incomes of the poorest 60 percent rose 2.3 times the national average in Sri Lanka, but annual average increases in their absolute incomes were less than one half those obtained by the poorest 60 percent in Korea.[78]

The changes in income distribution observed in Korea and Taiwan reflect the increased demand for labor in labor-intensive manufactured exports, which leads to higher employment and wages, as well as the lack of a substantial bias against agriculture. By contrast, policies of import substitution have usually involved turning the terms of trade against agriculture, the sector with generally the lowest incomes.[79] An extreme example is the case of Pakistan, where protection policies led to a decline in the terms of trade of agriculture by one half during the 1950s.[80]

Conclusion

This chapter has examined the implications of the choice of development strategies for the expansion of exports and for economic performance in eleven semi-industrial economies, which have been classified into four groups depending on the policies followed since World War II. The first group, which consists of Far Eastern economies that avoided a bias against exports and against primary activities, provided broadly equal incentives to most exports, and ensured the stability of the incentive system, had the best export performance during the period under consideration. Furthermore, reducing the bias against exports through the adoption of export incentives considerably improved the export performance of the second group, which comprises Latin American countries. In turn, Israel and Yugoslavia slackened their export promotion efforts, with an associated loss in their position relative to the first two groups. Finally, the fourth group, India and Chile, persisted in following import-substitution policies and had poor export performance in absolute as well as in relative terms.

Export expansion appears to have had beneficial effects on economic growth. Cross-sectional comparisons show a high correlation between exports and the growth of GNP, and in individual economies an acceleration of exports tends to be accompanied by an acceleration of the growth of GNP. The results are not materially affected if adjustment is made for the effects of changes in labor and capital inputs.

These results reflect the benefits derived under an outward-oriented strategy from resource allocation according to comparative advantage, increased capacity utilization, and the exploitation of economies of scale. Gains in employment may also be obtained as exports increase the demand for labor and thereby improve income distribution. The rise in real wages and lessened discrimination against agriculture also tend to reduce income inequalities.

The expansion of exports and the consequent growth of GNP have been the result of the incentives applied. Planning and programming played little role in the process. Also, high protection and a substantial anti-export bias in the import-substitution stage may hinder rather than promote the subsequent expansion of exports.

In this chapter emphasis has been given to the effects of the choice of development strategies on exports and economic performance. This should not imply that other influences, including political and social factors, would not affect the outcome. Nonetheless, changes in development strategies have greatly affected the economic performances of the individual economies without major modifications in the political and social environment.

Notes to Chapter 3

1. This definition of anti-export bias was introduced by B. Balassa and Associates, who expressed it in terms of effective protection (*The Structure of Protection in Developing Countries* [Baltimore, Md.: Johns Hopkins University Press, 1971], pp. 62–63, 331–32). Anti-export bias is defined in regard to individual commodities and commodity groups, irrespective of whether exportation actually takes place; in fact, the existence of such a bias may have precluded exportation. For the purpose of classifying development strategies, anti-export bias is expressed in aggregate terms by estimating average incentives (effective subsidy rates) to domestic and to foreign sales in the national economy as a whole.

2. The NBER research project covered ten countries at different levels of economic development: Brazil, Chile, Colombia, Egypt, Ghana, India, Israel, Korea, the Philippines, and Turkey. The Kiel project covered fifteen semi-industrial developing economies: Brazil, Colombia, Egypt, Hong Kong, Israel, Korea, Malaysia, Mexico, Pakistan, Singapore, Spain, Taiwan, Turkey, and Yugoslavia.

3. See J. B. Donges, "A Comparative Survey of Industrialization Policies in Fifteen Semi-industrial Countries," *Weltwirtschaftliches Archiv*, vol. 112, no. 2 (1976), pp. 627-59; and J. B. Donges and L. Muller-Ohlsen, *Aussenwirtschaftsstrategien und Industrialisierung in Entwicklungslandern*, Kieler Studien 157 (Tubingen: J. C. B. Mohr [Paul Siebeck]), chap. 3.

4. "Phase I is characterized by the imposition or sharp intensification of relatively undifferentiated—or across-the-board—controls . . . Phase II is characterized by continued reliance upon quantitative restrictions and, indeed, generally increased restrictiveness of the entire control system . . . Phase III usually starts with a formal parity change in exchange rates to reflect the *de facto* price of foreign exchange. This is accompanied by removal of some of the detailed regulations and a reduction in the multiplicity of rates found in Phase II . . . Phase IV features greater emphasis on price mechanisms than on quantitative restrictions in managing the balance of payments . . . Phase V is a period during which an exchange regime is fully liberalized, in the sense that there is virtually full convertibility on current account, and quantitative restrictions are not employed as a means of regulating the balance of payments." A. O. Krueger, *Foreign Trade Regimes and Economic Development: Liberalization Attempts and Consequences* (Cambridge, Mass.: Ballinger Publishing Co.,1978), p. 23.

5. J. N. Bhagwati, *Foreign Trade Regimes and Economic Development: Anatomy and Consequences of Exchange Control Regimes* (Cambridge, Mass.: Ballinger Publishing Co., 1978), pp. 207–11.

6. See Krueger, *Foreign Trade Regimes and Economic Development: Liberalization*, pp. 9 and 88; and Bhagwati, *Foreign Trade Regimes and Economic Development: Anatomy and Consequences*, p. 183. While Bhagwati refers to earlier calculations of the anti-export bias that made adjustment for input protection, those calculations related incentives to export value rather than to value added in exports. Despite Bhagwati's claim to the contrary, then, the earlier contributions used a different concept of anti-export bias from that introduced by the present author.

7. For example, Krueger defines an "overvalued exchange rate . . . as one that requires the support of quantitative restrictions," neglecting the fact that tariffs may have equivalent effects (*Foreign Trade Regimes and Economic Development: Liberalization*, p. 23).

8. According to Krueger, "By 1969, Michaely places Israel in Phase V" (ibid., p. 34). However, Michaely has not estimated the nominal and effective protection rates that would be necessary to indicate the extent of Israel's bias against exports (see Michael Michaely, *Foreign Trade Regimes and Economic Development: Israel* [New York: Columbia University Press, 1975]). At the same time, Baruh's estimates based on direct price comparisons do not show a reduction in the extent of anti-export bias—as measured by effective rates of protection—between 1968 and 1972 (see Joseph Baruh, "Protection Levels in Israel, 1968 and 1972–74," *Bank of Israel Economic Review*, no. 45-46 [February 1979], pp. 1–22). The estimates for Israel reported in the present volume pertain to 1968.

9. Krueger claims that "bias reduction is . . . a major concomitant of net devaluation" involving reduced reliance on quantitative restrictions in Phase III (*Foreign Trade Regimes and Economic Development: Liberalization*, p. 110). The evidence provided in support of this proposition is weak, however, since instead of direct price comparisons, the authors of the NBER studies have relied on price indices or interviews.

10. World Bank, *World Development Report, 1979* (New York: Oxford University Press, 1979), pp. 36–37. For purposes of this investigation, developing economies have been defined to include those of Latin America, Africa (other than South Africa), Asia (other than Japan), and Yugoslavia. The description of the development strategies applied in the six economies covered in Part II draws on the individual case studies.

11. T. Geiger, *Tales of Two City-States: The Development Program of Hong Kong and Singapore* (Washington, D.C.: National Planning Association, 1973), p. 8.

12. See P. Aydalot, *Essai sur les problèmes de la stratégie de l'industrialization en économie sous-développée: l'example Tunisien* (Tunis, 1968).

13. Singapore Department of Trade, *Annual Report* (Singapore: Ministry of Finance, 1968), p. 38.

14. Ibid., p. 40.

15. See B. Balassa, "Industrial Policies in Taiwan and Korea," *Weltwirtschaftliches Archiv*, vol. 105 (March 1977), pp. 55–77.

16. Wastage allowances were provided for the free importation of inputs in excess of the needs of export production.

17. In reviewing their experience up to the mid-1960s, Angel Monti concluded that "the four countries studied showed that there was instability, and in some cases, a chronic deficit, in the balance of payments. This caused many adverse consequences. In Argentina, it was an important factor in causing the pattern of growth to show a typical 'stop-go' behaviour. In Brazil it has already influenced the rate of growth. In Colombia, effects have been felt, including political effects. In Mexico it has caused a strong need for an inflow of foreign capital, thus aggravating the medium-term problem" ("Latin American Exports of Manufactures: Experiences and Problems," paper prepared for the ECLA/World Bank Seminar on Export Promotion Policies, November 1976, Santiago, Chile).

18. These figures exclude the subsidy value of credit preferences. See J. A. A. Savasini, *Export Promotion: The Case of Brazil* (New York: Praeger, 1978), pp. 30–39.

19. See W. G. Tyler, *Manufactured Export Expansion and Industrialization in Brazil*, Kieler Studien (Tubingen: J. C. B. Mohr [Paul Siebeck], 1976), p. 239.

20. See B. Balassa, *Policy Reform in Developing Countries* (Oxford: Pergamon Press, 1977), chap. 2.

21. See Baruh, "Protection Levels in Israel," p. 9.

22. See V. Dubey, "Yugoslavia: Commodity Exports and Export Policies," paper prepared for the ECLA/World Bank Seminar on Export Promotion Policies, November 1976, Santiago, Chile.

23. J. N. Bhagwati and T. N. Srinivasan, *Foreign Trade Regimes and Economic Development: India* (New York: Columbia University Press, 1975), chap. 6.

24. M. Wolf, "Indian Exports," paper presented at the ECLA/World Bank Seminar on Export Promotion Policies, November 1976, Santiago, Chile.

25. See Balassa and Associates, *Structure of Protection in Developing Countries*, chap. 7.

26. B. Balassa, "Effects of Commercial Policy on International Trade, the Location of Production and Factor Movements," in *The International Allocation of Economic Activity*, ed. B. Ohlin and others (London: Macmillan, 1977), p. 241.

27. H. B. Chenery, "Patterns of Industrial Growth," *American Economic Review*, vol. 50 (September 1960), pp. 624–54.

28. The latter calculation reflects the assumption that Korea's incentive system changed little between 1960 and 1968.

29. C. Diaz-Alejandro, *Foreign Trade Regimes and Economic Development: Colombia* (New York: Columbia University Press, 1976), p. 65.

30. J. D. Teigeiro and R. A. Elson, "The Export Promotion System and the Growth of Minor Exports in Colombia," *International Monetary Fund Staff Papers*, vol. 37 (July 1973), p. 446.

31. See Donges and Muller-Ohlsen, *Aussenwirtschafts-*

strategien, p. 143; and Krueger, *Foreign Trade Regimes and Economic Development: Liberalization*, p. 205. Krueger reports lower elasticities for Korea (0.12) and Taiwan (0.92) among the economies considered in the present study, while estimates for India, Mexico, and Yugoslavia were not statistically significant. For Israel, Halevi has estimated export elasticities ranging between 0.68 and 1.67 (N. Halevi, "Effective Devaluation and Exports: Some Issues in Empirical Analysis, with Illustrations from Israel," *Economica*, vol. 39 [August 1972], p. 297).

32. Taiwan's rice exports in 1973 were about ten times those of the years immediately preceding and following, owing to an exceptionally good harvest.

33. In Chapter 8 of this volume, Westphal and Kim take a somewhat more positive view of the importance of export targets in Korea.

34. B. Balassa, "The Economic Reform in Hungary Ten Years After," *European Economic Review*, vol. 10 (December 1978), pp. 245–68.

35. See B. Glassburner and J. Riedel, "Economic Development Lessons from Hong Kong: A Reply," *Economic Record*, vol. 49 (December 1973), p. 638.

36. B. Balassa, "A 'Stages' Approach to Comparative Advantage," in *Economic Growth and Resources*, vol. 4, *National and Institutional Issues*, ed. Irma Adelman (London: Macmillan, 1975), pp. 121–56. For an abbreviated version, see "The Changing Pattern of Comparative Advantage in Manufactured Goods," *Review of Economics and Statistics*, vol. 61 (May 1979), pp. 259–66.

37. Balassa, "A 'Stages' Approach to Comparative Advantage."

38. See F. T. Moore, "Economies of Scale: Some Statistical Evidence," *Quarterly Journal of Economics*, vol. 73 (March 1959), pp. 232–45; and D. F. Pratten, *Economies of Scale in Manufacturing Industry* (London: Cambridge University Press, 1971).

39. See M. Carnoy, *Industrialization in a Latin American Common Market* (Washington, D. C.: Brookings Institution, 1972).

40. C. H. Rocca, "Productivity in Brazilian Manufacturing Industries," in *Brazil: Industrialization and Trade Policies*, ed. J. Bergsman (London: Oxford University Press, 1970), app. 2.

41. J. Bergsman, "Commercial Policy, Allocative Efficiency, and 'X-Efficiency,' " *Quarterly Journal of Economics*, vol. 87 (August 1974), p. 419.

42. Balassa and Associates, *Structure of Protection in Developing Countries*, p. 82.

43. A. O. Krueger, "Some Economic Costs of Exchange Control: The Turkish Case," *Journal of Political Economy*, vol. 74 (October 1966), p. 475.

44. United Nations, *Yearbook of National Accounts Statistics, 1972* (New York, 1974).

45. H. G. Johnson, "Optimal Trade Intervention in the Presence of Domestic Distortions," in *Trade, Growth and the Balance-of-Payments: Essays in Honor of Gottfried Haberler*, ed. R. E. Baldwin and others (Amsterdam: North-Holland, 1965).

46. J. Nugent, *Economic Integration in Central America: Empirical Investigations* (Baltimore, Md.: Johns Hopkins University Press, 1974).

47. J. A. P. de Melo, "Estimating the Costs of Protection: A General Equilibrium Approach," *Quarterly Journal of Economics*, vol. 92 (May 1978), pp. 209–26.

48. The welfare cost of protection is 3.9 percent and 5.5 percent under the two alternatives, respectively, if measured by changes in the utility of producers and consumers.

49. H. G. Johnson, "The Possibility of Income Losses from Increased Efficiency of Factor Accumulation in the Presence of Tariffs," *Economic Journal*, vol. 77 (March 1967), pp. 151–53.

50. R. Martin, "Immiserizing Growth for a Tariff-Distorted Small Economy: A Further Analysis," *Journal of International Economics*, vol. 7 (November 1977), pp. 323–28.

51. H. J. Bruton, "Productivity Growth in Latin America," *American Economic Review*, vol. 57 (December 1967), pp. 1103–04.

52. Michaely objects to this procedure on the grounds that "since exports are themselves part of the national product, an autocorrelation is present: and a positive correlation of the two variables is almost inevitable, whatever their true relationship with each other" (Michael Michaely, "Exports and Growth: An Empirical Investigation," *Journal of Development Economics*, vol. 4 [December 1977], p. 50). But import-replacing domestic production, too, is part of the gross national product, so that in an intercountry framework, export growth rates may reflect alternative uses of resources. The procedures applied abstract from the fact that exports and output may be simultaneously affected by other variables, such as increases in the capital stock and in the labor force. An adjustment for these factors will be made below. At any rate, Michaely's objection does not apply to incremental export-output ratios, which have been used as an alternative to export growth rates.

53. The Israel-Mexico comparison provides an exception, however: Despite its lower incremental export-output ratio, Mexico had a higher manufacturing growth rate than Israel.

54. For eleven observations, levels of significance are 0.1 percent for a Spearman rank correlation of 0.82 or higher, 0.5 percent for coefficient values of 0.73 or higher, and 1 percent for coefficient values of 0.41 or higher.

55. The ratios for import substitutes are understated since the data used refer only to import substitutes actually produced in Korea, and do not include the presumably highly capital-intensive intermediate products imported from developed countries and not produced in Korea.

56. Tyler, *Manufactured Export Expansion and Industrialization in Brazil*, p. 147.

57. A high correlation is shown if we follow Michaely in correlating increments in export-output ratios with the growth of output. The Spearman rank correlation coefficient is 0.776, compared with 0.523 in Michaely's own sample, which combines countries at different income levels and with very different export structures. See B. Balassa, "Exports and Economic Growth: Further Evidence," *Journal of Development Economics*, vol. 5 (June 1978), pp. 181–88.

58. C. Michalopoulos and K. Jay, "Growth of Exports and Income in the Developing World: A Neoclassical View," AID Discussion Paper, no. 28 (Washington, D.C.: Agency for International Development, 1973).

59. In each case, calculations have been made using 1960 as the base year for 1960–66 and 1966 as the base year for 1966–73.

60. Krueger, *Foreign Trade Regimes and Economic Development: Liberalization*, p. 273.

61. World Bank, *World Tables* (Baltimore, Md.: Johns Hopkins University Press, 1976).

62. The increased use of capacity after 1966 led some writers to conclude that the export-induced expansion largely represents actual output catching up with potential output in the manufacturing sector. For example, see E. Bacha, "Issues and Evidence on Recent Brazilian Growth," *World Development*, vol. 5 (January-February 1977), pp. 47–67; and P. Malan and M. Bonnelli, "The Brazilian Economy in the 1970s: Old and New Developments," *World Development*, vol. 5 (January-

February 1977), pp. 19–45. For a criticism of this view, see B. Balassa, "Incentive Policies in Brazil," *World Development*, vol. 7 (November 1979), pp. 1023–42.

63. W. M. Corden, "The Effects of Trade on the Rate of Growth," in *Trade Balance of Payments and Economic Growth: Essays in Honor of Charles P. Kindleberger*, ed. J. Bhagwati and others (Amsterdam: North-Holland, 1971).

64. J. A. P. de Melo and K. Dervis, "Modelling the Effects of Protection in a Dynamic Framework," *Journal of Development Economics*, vol. 4 (December 1977), pp. 166–68.

65. T. E. Weisskopf, "The Impact of Foreign Capital Inflow on Domestic Savings in Underdeveloped Countries," *Journal of International Economics*, vol. 2 (February 1972), pp. 25–38.

66. Gustav Papanek, "Aid, Foreign Private Investment, Savings and Growth in Less Developed Countries," *Journal of Political Economy*, vol. 81 (January-February 1973), pp. 120–30.

67. Alfred Maizels, *Exports and Economic Growth in Developing Countries* (Cambridge, England: Cambridge University Press, 1968), chap. 2.

68. Bhagwati and Srinivasan, *Foreign Trade Regimes and Economic Development: India*, chap. 16.

69. Earl Grinols and J.N. Bhagwati, "Foreign Capital Savings and Dependence," *Review of Economics and Statistics*, vol. 58 (November 1976), pp. 416–24.

70. Bhagwati, *Foreign Trade Regimes and Economic Development: Anatomy and Consequences*, p. 211.

71. Data on the labor intensity of exports compared with that of import substitutes in manufacturing industries were cited above. For all trade, Krueger reports results for seven developing countries on the labor required both directly and indirectly in the production of nontraded inputs in export and import-competing industries. The estimated ratios of labor requirements in exports to those in import-competing industries range from 0.96 to 2.67, the median being 1.35 (A. O. Krueger, "Alternative Trade Strategies and Employment in LDCs," *American Economic Review*, vol. 68 [May 1978], p. 272). The 0.96 figure for Korea is explained by the inclusion of natural resource products in the estimates; thus, Westphal and Kim have also found that the relative labor intensity of Korean manufactured exports was reversed by including natural resource products in the calculations (see Chapter 8).

72. R. Banerji and J. Riedel, "Industrial Employment Expansion under Alternative Strategies: Some Empirical Evidence," Kiel Working Papers, no. 63 (Kiel: Kiel Institute of World Economics, 1977).

73. Ibid., tables 2 and 3. In the case of Taiwan, estimates for 1961–66 and 1966–71 have been combined in an approximate fashion. Donges and Muller-Ohlsen have also found that the ratio of the rate of growth of employment to that of output was higher under outward than under inward orientation (*Aussenwirtschafts-strategien*, p. 121).

74. Banerji and Riedel, "Industrial Employment Expansion under Alternative Strategies," table 1.

75. Data on nominal wages are taken from the International Labour Office, *Yearbook of Labor Statistics*, and deflated by the consumer price index in the International Monetary Fund, *International Financial Statistics*, except for Taiwan, for which the *Statistical Yearbook of the Republic of China* was used.

76. See H. Choo, "Probable Size Distribution of Income in Korea: Over Time and by Sectors," in *Income Distribution by Sectors and Time in East and South-East Asian Countries*, ed. H. T. Oshima and T. Mizaguchi (Quezon City, Philippines: Council for Asian Manpower Studies; and Tokyo: Institute of Economic Research, Hitotsubashi University, 1978), p. 117; and C. C. Chen, "Over Time Changes of Personal Income Distribution in Taiwan (1964–1975)," ibid., p. 149.

77. See M. S. Ahulwalia, N. G. Carter, and H. B. Chenery, *Growth and Poverty in Developing Countries*, World Bank Staff Working Paper, no. 309 (Washington, D.C.: World Bank, 1978), p. 28. Income distribution in Korea deteriorated again after the 1973 oil crisis (see Choo, "Probable Size Distribution of Income in Korea," p. 117). Correspondingly, in a revised version of their paper (May 1979), Ahluwalia, Carter, and Chenery show little difference in the rate of income growth for the poorest 60 percent and the national average for the period 1965–76 (p. 32).

78. Ahulwalia, Carter, and Chenery, "Growth and Poverty," p. 32.

79. An exception is the temperate zone in Argentina, where agricultural incomes are traditionally high.

80. See S. Lewis, *Economic Policy and Industrial Growth in Pakistan* (London: Allen and Unwin, 1969), chap. 1.

4

Reforming the System of Incentives in Developing Economies

BELA BALASSA

The preceding chapter examined the experience of eleven semi-industrial developing economies with their trade and development policies during the post–World War II period. This chapter makes recommendations for an ideal system of incentives for semi-industrial developing economies and for developing countries in general. Consideration is given to trade policy measures and to measures affecting capital and labor markets and the pricing of public utilities.

The recommendations reflect the experience of the individual economies studied, the author's experience as a policy adviser in developing countries, as well as a priori arguments based on received theory. They are formulated in terms of remedying distortions in product and in factor markets resulting from governmental actions or market imperfections that create a wedge between social and private profitability.[1] Note will be taken of second-best considerations, including the policy implications of the cost of raising taxes. The possible effects of the suggested measures on employment, income distribution, and savings are also indicated.

The chapter first examines distortions in the markets for capital and labor and in the pricing of public utilities, with further reference to the treatment of government enterprises. This is followed by an analysis of trade policy alternatives, including the treatment of particular sectors, the relative incentives provided to exports and import substitution, the structure and the level of incentives to manufacturing, and the choice among measures of import protection. Next, institutional constraints in the form of international trading rules and actions taken by developed countries are discussed, together with their implications for choosing among alternative ways of implementing the proposed system of incentives. The chapter ends with a discussion of the measures necessary to accomplish the transition from a situation characterized by distortions in factor and product markets to an "ideal" system of incentives.

Remedying Distortions in Factor Markets and in Public Utility Pricing

Although economists traditionally focused on distortions in product markets that result from the application of protective measures, in recent years attention has been given to distortions in capital markets that are caused or aggravated by governmental actions. Elaborating on the ideas of Shaw, McKinnon gives these distortions central place in arguing that "appropriate policy in the domestic capital market is the key to general liberalization, and particularly to the withdrawal of unwise public intervention from commodity markets."[2]

Distortions in Capital Markets

The relative importance of distortions in capital and in product markets in developing countries is a moot point. Aside from the difficulties of measurement, it is apparent that these distortions vary in importance from country to country. And, to reverse McKinnon's dictum, it may also be suggested that trade liberalization is a pre-

condition for the efficient allocation of investment funds. Rather than attempting to evaluate their relative importance, in what follows we shall focus on the interdependence of these distortions and on the measures that may be used to remove them.

Distortions in capital markets are indicated by continuing differences between rates of return on alternative investments in physical and in financial assets (including money), with allowance for risk. Apart from imperfections in capital markets, such distortions may be caused by government policies that result in high and unstable rates of inflation, the oft-observed tendency to keep interest rates low, and credit rationing.

High and unstable—and hence unanticipated—rates of inflation discourage the holding of financial assets unless these assets are fully indexed, which is not the case in any developing country.[3] In particular, the lack of indexing of demand deposits in the face of inflation represents a tax on non-interest-bearing money holdings. This implicit tax, as well as the uncertainties pertaining to the real rate of interest on financial assets, encourages people to substitute real assets for financial assets. The ensuing reduction in the demand for financial assets in turn leads to financial disintermediation, since the banking system cannot appropriately fulfill its function of channeling funds to more productive uses.

The situation is aggravated by the common tendency to keep nominal interest rates low. In several Latin American and Asian countries, real interest rates on savings held with the banking system as well as on bank loans have been negative for protracted periods. This policy has adversely affected the volume of savings and the allocation of savings among alternative investments, and it has also encouraged the investment of domestic savings abroad.

Low and negative real rates of return on financial assets are an inducement to increase present consumption at the expense of savings. Self-investment at low returns, including the accumulation of inventories, is also encouraged, thus diverting funds from higher yielding investments in the national economy. In the absence of effective domestic financial intermediation, incentives are provided to invest abroad at rates of return below those attainable in domestic investments.

With low and negative real interest rates creating an excess demand for funds, banks have to apply credit rationing. In developing countries credit rationing generally benefits the modern sector, particularly import-substituting investments, which involve low risks since foreign competition is virtually excluded through high protection. Low interest rates also favor capital-intensive industries and production methods. Moreover, capital-intensive import-substituting investments often receive priority in cases where credit allocation is undertaken, or influenced, by the government.

Credit rationing can also exacerbate the inequality of income distribution, in part by encouraging capital-intensive activities, and in part by limiting the access to bank financing of small industrial firms and farmers. These producers have to borrow in segmented informal or curb markets at high rates of interest, which often reflect not only credit risks, but also the money lenders' quasi-monopolistic position and the risk of prosecution under anti-usury legislation.

Government policies, then, tend to aggravate conditions in the undeveloped capital markets of the developing countries. The resulting disincentives to save, misallocation of investments, and flight of capital abroad lessen the potential for economic growth and adversely affect the distribution of income. These adverse consequences can be reduced if measures are taken to eliminate distortions caused by government action and to improve the functioning of capital markets.

Eliminating these distortions calls for monetary reform. Desirable reform measures include reducing the rate of inflation and its variability, eliminating interest rate ceilings, and ensuring that investors face identical credit conditions, with allowance made for differences in the riskiness of alternative investments.

These measures tend to reinforce each other and can be considered as a package. In particular, the application of a deflationary monetary policy, by itself, would tend to aggravate conditions during the period of transition to a lower rate of inflation, which may be rather long. First, such a policy would reduce output levels by depressing aggregate demand. Second, in reducing the availability of credits to producers, it would accentuate disintermediation by the banking system that resulted from rapid inflation. As McKinnon noted in referring to the experience with deflationary monetary policies in Chile in 1955–57 and in Brazil in 1964–67, "disintermediation resulted from the buildup of inflationary expectations that reduced the real return on holding money [during the period of rapid inflation; subsequently, it was the result of] 'orthodox' deflationary policy in the form of credit ceilings, reduced rediscount tranches, increased reserve requirements, and so on that contributed further to a contraction."[4]

These adverse consequences may be avoided, or at least minimized, if the private demand for money and for other financial assets is stimulated by raising the real rate of interest. This may be accomplished by setting nominal rates of interest above the expected rate of inflation by a sufficient margin, while instituting greater fiscal discipline so as to reduce inflationary expectations.

The demand for money has its counterpart in the supply of goods, through reductions in inventories that will induce the expansion of domestic production, provided that credits are made available to the private sector to fuel the expansion. Together with reductions in the

deficit of the public sector, the result will be a shift toward more productive activities.

The increase in output further raises the demand for money, and one can avoid rekindling inflationary expectations as long as the demand for money increases faster than its supply. At the same time, positive real rates of interest will encourage savings and discourage capital flight. Finally, the elimination of government intervention in credit markets will improve the allocation of investment funds among sectors.

Korea provides an example of successful monetary reform. In 1965 interest rate ceilings on savings deposits of different maturities were raised from 9–15 percent to 18–30 percent, and those on bank loans from 14 to 26 percent, while the rate of inflation fell from 35 to 10 percent. With the demand for money increasing more rapidly than its supply, the real value of money balances increased and production expanded. Higher real interest rates also led to an increase in savings while discrimination among alternative investments was reduced.[5]

In extending the scope of financial intermediation, monetary reform tends to improve the functioning of capital markets.[6] Legalizing curb markets would further contribute to this goal by reducing the segmentation of credit markets and increasing their transparency. At the same time, with the increased role of banks, curb markets become subject to competition. Additional improvements may be made by increasing competition among banks or, where doing so would involve a substantial loss of economies of scale, regulating banks so that they behave as in a competitive system.

Reducing and stabilizing the rate of inflation and increasing the real rate of interest augment the demand for long-term financial assets and thus necessitate the development of financial intermediaries. What form these intermediaries should take—whether investment banks, stock exchanges, or bond houses, for example—will depend on the degree of economic development and the financial sophistication of the country concerned.

The application of the proposed measures would contribute to economic growth by increasing savings, as well as by improving the allocation of these savings among alternative investment opportunities. Increases in real interest rates, the development of financial markets, and monetary reform in general would contribute to these results. Further improvements could be attained by reducing the bias in favor of capital-intensive industries and production methods through fiscal reform involving the abolition of provisions for accelerated depreciation that lower the cost of capital.

Distortions in Labor Markets

In many developing countries, government policies that lower the cost of capital have their counterpart in measures that increase the cost of labor to the firm. High social charges, together with minimum wage legislation, will have such an effect. In particular, severance pay regulations may discourage increased employment in the modern industrial sector.

High wages and social benefits in large-scale industry may also have an adverse effect on agricultural production, since migration takes place in response to observed wage differences. According to Harris and Todaro,[7] migrants tend to equalize the mathematical expectation of their earnings, taking account of the probability of obtaining a job in large-scale manufacturing. In the simplest case, if industrial wages are double the wages in agriculture, migration will take place until the probability of finding an industrial job declines to one half. Efficient resource allocation will suffer as a result, since the loss of output in the agricultural sector will outweigh the gain in the protected manufacturing sector, both measured in world market prices.

Easing restrictive labor regulations in the modern industrial sector would lessen migration that has a cost to the national economy. Although such recommendations are hardly popular, it should be recognized that the measures applied in many developing countries favor workers in large-scale manufacturing at the expense of workers in other sectors of the economy and the unemployed.

Apart from government intervention, distortions in labor markets may be due to market imperfections, of which the existence of unemployment or underemployment of unskilled labor at the "social" minimum wage is a particular case. Such a situation reflects differences between market wages and shadow wages, when the latter express the opportunity cost of labor. At the same time, market and shadow wages are unlikely to differ for skilled and technical labor, which tend to be in short supply in most developing countries. In regard to unskilled labor, also, corrective measures should be taken only if the existence of such differences is well established.

As to possible ways of remedying differences between market and shadow wages, it has been proposed that rates of protection should vary according to the (unskilled) labor intensity of the production process.[8] This alternative has important disadvantages, however, as it provides incentives to the use of all factors—and not only of unskilled labor—in protected industries, and it does not encourage the substitution of unskilled labor for other factors of production in particular sectors.

Also, tariffs discriminate against primary activities and manufacturing for export, both of which tend to be more labor intensive in developing countries than import substitution in protected manufacturing. To the extent that protection leads to the decline of these activities, employment will suffer. Conversely, as noted below, reducing tariffs will tend to benefit employment.

One may instead encourage employment in protected as well as in unprotected activities and promote the expansion of industries using unskilled labor by subsidizing its use uniformly in all industries. Such subsidies may be given by reducing the social security taxes paid by employers and employees and financing a larger share of social security expenditures from the general budget.

In countries where the social security system has limited scope, consideration may be given to subsidizing the consumption of a basic staple, for example by removing indirect taxes on the product in question. In the absence of indirect taxes on the product, recourse may be had to direct subsidies to consumers, so as to avoid discouraging domestic production by lowering the price paid to producers. Subsidies to consumption may be financed by setting higher indirect taxes on other commodities, in particular luxury goods. Despite its budgetary cost and the resulting distortion in consumer demand, this alternative is preferable to the imposition of tariffs, which may reduce rather than increase total employment.

Public Utility Pricing and Government Enterprises

Public utilities in many developing countries are underpriced in the sense that the price does not cover the sum of social long-run marginal cost and consumer surplus.[9] The underpricing of public utilities, in turn, has adverse economic effects by raising demand for the products of a highly capital-intensive industry, overtaxing existing facilities such as the telephone system, and indirectly subsidizing the high-cost and capital-intensive import-substituting industries that are typically important users of public utilities.

More rational pricing of public utilities would improve the efficiency of resource allocation and would reduce pressures on credit markets as well as on the government budget. Similar considerations apply to public enterprises in other sectors. The products of these firms have often been underpriced for political reasons, with losses being financed from the government budget or through preferential credit allocation. The monopolistic position of such enterprises provides little incentive for reducing costs or improving technology.

Increasing domestic and foreign competition would exert pressures on public enterprises producing traded goods to improve their operations. To accomplish this objective, public enterprises would have to act as profit maximizers, as they are supposed to do since the 1968 economic reform in socialist Hungary. This, in turn, would require them to be independent of government administration.

The Choice of Trade Policy Measures

The next question concerns the choice of a system of incentives which will ensure the equalization of social profitability among sectors, as well as between exports and import substitution within sectors. As for the treatment of particular sectors, we shall consider the optimal tariff argument as well as possible reasons for giving the manufacturing sector preferential treatment.

The Use of Export Taxes

The optimal tariff argument pertains to the case when a country can affect world market prices by its own actions. This will be so either when the foreign demand for the country's exports is less than infinitely elastic or when the foreign supply of its imports is less than infinitely elastic. In practice, since developing countries are generally price takers in import markets, the latter situation can be disregarded; hence we shall concentrate on the case of monopolistic power in export markets.

Export earnings will be maximized by levying an export tax so that the marginal revenue from exports becomes zero. The tax rate that will maximize export earnings depends on the elasticity of foreign demand alone; an export tax will be appropriate only if this elasticity is less than unity.[10] Maximizing export revenue will be optimal, however, only when domestic production is costless. Otherwise, to maximize welfare the marginal revenue from exports must be equated to the long-run marginal cost of the industry,[11] with allowance for the use of exhaustible resources in exporting. Now, the elasticity of domestic supply will enter the calculations in addition to the elasticity of foreign demand, and the imposition of an optimal export tax requires only that foreign demand be less than infinitely elastic.

Additional considerations apply when an export commodity facing less than infinitely elastic demand abroad is used domestically as an input in manufacturing industries, as in the case of copper in copper fabrication in Chile. If the country in question is a price taker in the world market for the processed commodity, welfare maximization will require that the raw material be provided to domestic users at the long-run marginal cost, which involves equating prices on domestic sales to the marginal revenue from exports. This conclusion will need to be modified if the country is not a price taker for the processed commodity, or if there is a danger of retaliation by foreign buyers on the grounds that domestic sales at lower than export prices represent an export subsidy. (A case in point is the objection by the United

States to Brazilian exports of soluble coffee made from green coffee priced below the world market level.)

Preferential Treatment of Manufacturing

Assuming that optimal export taxes are imposed on commodities facing less than infinitely elastic demand abroad, the question remains whether different sectors should receive different incentives if social profitability is to be maximized. The preferential treatment of manufacturing activities has been advocated on the grounds that these activities generate external economies, which raise their social profitability above the level of private profitability.[12] In particular, it has been claimed that the existence of particular cost disabilities and their superior promise for improvements in productivity warrant granting preferential treatment to the manufacturing sector.

Among the possible sources of cost disadvantages faced by this sector, those often referred to are the lack of adequate infrastructure, high utility rates, and the scarcity of financial resources. It would appear, however, that in most developing countries these factors hamper agriculture more than manufacturing. As a result of political pressures emanating from the urban sector, manufacturing activities generally enjoy better infrastructure, lower utility rates, and more extensive credit facilities than agriculture, whose development is often hampered by a lack of adequate roads and electricity networks and difficulties in obtaining credit.

Other arguments for the preferential treatment of manufacturing stress the riskiness of new industries and the desirability of learning by doing. But, since these sources of cost disabilities are temporary, special treatment granted on such a basis would also need to be temporary. We shall return to this issue following a consideration of arguments for granting manufacturing activities preferential treatment on a continuing basis because of the promise of future productivity improvements.

Such arguments have been advanced on the grounds that productivity tends to rise more rapidly in manufacturing than in agriculture. But the opposite may happen, as it has in the United States and in developing countries that have introduced modern techniques of farming.

It may be argued, however, that manufacturing activities provide social benefits not captured in the entrepreneur's profit calculations, in that they produce skilled labor and technological change. There is a difference in this regard between manufacturing and agricultural activities, since the latter generally use less skilled and technical labor, and technological change is promoted chiefly by agricultural stations rather than by individual firms. Such external economies, then, warrant some degree of preferential treatment for manufacturing industries in developing countries.

Incentives to Exports and to Import Substitution

As repeatedly stated in the economic literature, in the presence of external economies, production subsidies are superior to tariffs because they affect production for domestic and for foreign markets in the same way and avoid the distortions in consumption patterns that result from the application of tariffs. The equal treatment of sales in domestic and foreign markets is indeed desirable, since otherwise the domestic resource costs of saving foreign exchange through import substitution and earning it through exports would differ. This conclusion is reinforced by the fact that exports permit the exploitation of economies of scale and obviate the need for continuing import substitution at ever increasing costs. Finally, greater familiarity with foreign markets provides incentives for technological change and product improvement, as was noted in Chapter 3.

Sales in domestic and in foreign markets will receive equal treatment if export subsidies are provided at the same rate as import tariffs. Such a tariff-cum-export-subsidy scheme will have the same effect as production subsidies, except that consumption patterns will be distorted as a result of the changes caused in the relative prices of manufactured and primary products. Nevertheless, the scheme has the important advantage of a lower budgetary cost than a production subsidy. The advocates of production subsidies disregard budgetary considerations on the assumption "that government intervention is a costless operation; in other words, there is no cost attached to the choice between a tax and a subsidy." But while such an assumption is "in accordance with the conventions of theoretical analysis of these problems,"[13] it does not conform to the conditions existing in most developing countries.

At the same time, the welfare loss caused by the distortions in consumption patterns associated with the tariff-induced changes in relative prices is difficult to gauge, and it is unlikely to outweigh budgetary considerations in most developing countries. Correspondingly, apart from exceptional cases in which there are no budgetary constraints, a tariff-cum-export-subsidy scheme will be judged preferable to production subsidies.

It has been suggested nevertheless that import tariffs be set higher than export subsidies because of the danger of foreign dumping. But, in view of the paucity of actual cases of dumping, this argument should not be used to countenance the levying of higher tariffs on imports in

general. Considering further the adverse effects of disincentives to exports, reliance should be placed on antidumping measures in cases when the existence of dumping has been established.

It has also been argued that import tariffs should be set higher than export subsidies because of the uncertainties associated with sales abroad. This argument is based on the assumption that exporters tend to understate the risks they face in selling abroad.[14] Yet, if anything, the threat of bankruptcy may lead exporters to overestimate these risks.

Finally, it has been suggested that higher import tariffs should be applied to protect infant industries. But infant industry protection should be applied to exports as well, and, indeed, it may be desirable to grant new export activities additional incentives. First, there are additional costs in entering foreign markets, such as larger outlays for collecting information and marketing; second, the risk to individual exporters tends to be greater than to the national economy, which has a diversified export structure. Even so, just as in the case of infant industry protection, additional incentives for new exports should be given only on a temporary basis, until new markets have been established.

The desirability of giving equal incentives for exports and import substitution applies to manufactured goods and to primary products alike, with exceptions made for exports that face less than infinitely elastic demand abroad. Apart from some traditional primary exports, the latter possibility may exist in regard to certain manufactured exports, for example those that are subject to quota restrictions abroad.

The Structure of Incentives to Manufacturing

We have concluded that the preferential treatment of manufacturing activities is warranted because of the external economies they generate, and that such treatment should be provided through a tariff-cum-export-subsidy scheme. But neither the magnitude of these external economies nor their variation among industries is known with any degree of confidence. For example, although at one time textile production was considered a vegetative industry in Latin America, in recent years it has had one of the best records of productivity improvement among the major producing countries. Also, suggested criteria for evaluating external economies on the basis of the number of technical processes utilized and their potential applicability in other industries are open to the objection that they neglect intra-industry external economies and the transfer of technology from abroad.[15] At any rate, such estimates are subject to considerable error.

Since little is known about the extent of the additional social benefits that particular manufacturing activities generate, it may be appropriate to apply as a first approximation the "market principle" in granting equal protection to all manufacturing industries and to let competition do the rest. This rule, however, should be interpreted in terms of effective rather than nominal rates of protection.

In the absence of distortions in factor markets, the effective rate of protection provides a measure of the domestic resource cost of earning (or saving) foreign exchange in particular activities.[16] If it is assumed that there are no differences among manufacturing activities with regard to the external economies they generate, the growth contribution of the manufacturing sector will be maximized and the domestic resource cost of earning (or saving) foreign exchange will be minimized—if all industries within the sector receive equal effective protection.[17]

Exceptions to this rule should be made only if it is well established that an industry generates substantially greater (or lesser) external economies than average. In making exceptions, one should avoid the use of tailor-made tariffs benefiting a particular firm in response to pressures by special interest groups. In general, the burden of proof should be on those requesting special treatment.

If special treatment is to be granted, it should take the form of direct subsidies rather than higher rates of protection.[18] Although it has been suggested that technologically sophisticated industries should receive additional protection because they promise greater than average improvements in productivity, direct subsidies for research and product development are preferable to protection, which may lead to the establishment of high-cost firms.

The recommendation that equal effective rates of protection be applied to all manufacturing activities rests on the premise that the cost of protection represents a loss in productive efficiency. Johnson points out that this recommendation needs to be modified if account is taken of the consumption cost of protection (loss in consumer surplus) associated with distortions in relative prices.[19] Given the difficulties of measuring the loss in consumer surplus, however, Johnson's statement can be little more than a qualification to the general rule stated above.

Nor is higher protection of the domestic production of luxury goods warranted on grounds of income distribution. Although taxing the consumption of luxury goods would be appropriate in countries which encounter difficulties in collecting income taxes, domestically produced luxury goods should also be taxed lest their production be encouraged. This may be done by imposing excise taxes on luxury imports *and* on domestic production at identical rates.

The application of higher tariffs may be warranted, however, when consumers are judged to have an irrational preference for foreign goods that involves a cost to the national economy because consumer goods are imported at a higher cost than they can be produced domestically. But exceptions should be made sparingly since such cases are difficult to establish, and one should avoid the excessive protection of consumer goods industries that condones inefficient domestic production.

The Level of Protection and the Infant Industry Argument

In regard to the desirable level of protection of manufacturing industries in present-day developing countries, it has been alleged that the developed nations of today applied high rates of protection at the early stages of their industrialization. Historical evidence does not support this claim, however. Except in Russia and the United States, rates of protection were much lower at comparable stages of industrialization in the present-day developed nations than they have been in the developing countries that have followed policies of import-substituting industrialization.[20]

The Russian and the American cases may be explained by the fact that these countries had large domestic markets, and hence the cost of production was lower than elsewhere.[21] Nevertheless, at the time of industrialization, tariffs in the United States were below those in the major developing countries of today and were further reduced over time.[22] Nor did the United States employ the panoply of measures, in particular quantitative restrictions, that have been widely applied by developing countries since the end of World War II.

Most developing countries have small domestic markets for manufactured goods and therefore should follow the example of the smaller developed nations by setting low levels of protection. In view of the adverse effects of high protection described in Chapter 3, it would also appear that effective protection rates on manufactured activities in excess of about 10 percent impose costs that are not commensurate with the expected benefits. This level may be considered a long-term target, to be reached over time.[23]

The question remains whether new industries should receive additional protection on infant industry grounds. It has been argued that such is not the case since the entrepreneur will discount future benefits and costs so that the discounted values of social and private profits will coincide. According to this view, start-up costs and learning by doing do not provide grounds for protection.

This objection will not hold, however, if we admit imperfections in capital markets and differences between the private and the social evaluation of risk. With imperfections in capital markets, the entrepreneur will have to borrow at rates exceeding the social rate of discount, so that the present value of private profits will fall short of that of social profits. The improvements in the structure of capital markets recommended in the first section of this chapter would reduce the significance of this objection, but would not invalidate it, since the functioning of capital markets is related to the general process of economic development. Moreover, there are differences in the evaluation of risk from the private and from the social point of view. In particular, in making decisions, the entrepreneur may use a higher discount rate and give greater weight to the possibility of negative profits—conceivably even bankruptcy—than does society.

With imperfections in capital markets and the risk of bankruptcy for the entrepreneur, then, there is a case for providing additional protection to new activities in developing countries. Such infant industry protection should be given only on a temporary basis, however, to prevent inefficient activities from becoming established and indefinitely maintained. And, with the need for protection on infant industry grounds decreasing over time, it should be given on a declining scale.

The duration of infant industry protection (say, five to eight years), as well as the rates at which it is provided, should be determined in advance so that firms can prepare to face foreign competition. It would also be desirable to set standard rates of infant industry protection, to avoid tailor-made protection in response to pressures from special interest groups. Exceptional cases aside, it does not appear likely that rates of effective protection more than double those for established industries would be warranted on infant industry grounds.

Relationships between Nominal and Effective Rates

We have suggested that target rates of protection for manufacturing activities be formulated in terms of effective rather than nominal protection. Tariffs—and export subsidies—are, however, levied in nominal terms. This raises the question of how the desired set of effective rates can be obtained through an appropriate choice of nominal rates.

Equal nominal rates would not ensure equal effective rates in all manufacturing activities, since industries using unprotected primary products as inputs would receive higher effective protection than those using protected inputs. Rather, equalizing effective rates in the manufacturing sector would require an escalation of nominal rates from lower to higher stages of transformation.[24]

Two possible approaches may be used to set the

nominal rates that correspond to the desired set of effective rates: by proceeding on a commodity-by-commodity basis from lower to higher stages of processing, or by inverting an input-output table.[25] The first approach was used in Korea, where "product trees" based on the use of particular raw materials were established, and tariffs were equalized within each commodity category characterized by the use of a particular input, such as cotton or leather.[26] The second approach was employed by the Junta of the Andean Common Market in setting tariffs on the basis of desired effective protection rates.[27]

There are drawbacks to both approaches. The product-tree approach is difficult to apply in practice because some materials are used as inputs at several stages of transformation, and because machinery is both a final product and an input at earlier stages of transformation. In turn, the second approach requires a large computer capacity for the simultaneous solution of the equation system. And both approaches share a need for detailed input-output data.

The problem of computer capacity was handled at the Junta by solving the system of equations separately for major product groups and expressing them in a simplified form when combining the results. Nonetheless, problems remain owing to the lack of detailed input-output data and the possibilities of error in such data. Limiting the variability of effective rates of protection as suggested above, however, will limit the magnitude of potential errors.

Tariffs versus Quantitative Restrictions

We have considered so far the application of import tariffs and export subsidies in developing countries. Tariffs are not the only means of import protection, however. The cost of imported goods to the consumer may be raised by other tariff-type measures, such as import taxes and surcharges, prepayment requirements, and multiple exchange rates. Imports may also be subject to quantitative restrictions such as quotas, licensing, and prohibitions, as noted in Chapter 1. In the following, we shall consider the choice between tariff-type measures (for short, tariffs), which raise prices directly, and quantitative restrictions, which set permissible levels of imports and raise domestic prices indirectly by limiting supplies.

Quantitative import restrictions have been employed by many developing countries. Their use has been advocated on the grounds that they provide a quick response in emergencies, that their effects on the balance of payments can be easily ascertained, and that they effectively limit imports of luxury goods. Quantitative restrictions may indeed be used to advantage in emergencies, such as a sudden deterioration in the balance of payments. This is not a valid argument for their continued application, however, since over a longer period tariffs will be equally effective in reducing imports. Furthermore, although the direct effects of quantitative restrictions on the balance of payments can be easily ascertained, their protective effects cannot be established with confidence, and thus it is difficult to evaluate their cost to the national economy.

To gauge the protective effects of quantitative restrictions, comparisons of domestic and foreign prices need to be made. Indeed, some countries have established criteria for import licensing in terms of maximum differences between domestic prices and the world market prices of competing imports. Domestic and foreign prices can readily be compared for standardized products such as primary copper and steel ingots that have identical specifications. Price comparisons are difficult to make, however, when domestic and foreign products differ in quality, performance, durability, the frequency of repairs, or product specifications in general.

These difficulties tend to increase with the process of industrialization that entails a rise in the share of machinery, equipment, and other differentiated products in total production. Correspondingly, as import-licensing criteria based on price comparisons become increasingly inadequate, a considerable degree of arbitrary decisionmaking is introduced. Moreover, once an application for an import license has been rejected, it is practically impossible to police the conformity of domestic products to specifications.

At the same time, the production process is very sensitive to relatively small variations in the specifications of machinery, materials, parts, components, and accessories. Production at subsequent stages of transformation will suffer as a result or, alternatively, "backward integration" will take place through the production of various inputs by the user. In both cases, there is a cost to the national economy since the purchase of less than fully satisfactory inputs will adversely affect product quality and will necessitate the reworking of materials and products while, in the event of backward integration, economies of scale will be forgone.

Tariffs are free of these disadvantages because the decision on importation is made by the user, who will take account of product quality and specifications as well as price. And since the application of tariffs is automatic, it avoids the arbitrariness associated with case-by-case decisionmaking in the granting of import licenses and thereby reduces uncertainty for the user.

Furthermore, tariffs have a lower administrative cost than import licensing and contribute to government revenue, whereas under licensing the difference between the domestic and the foreign price generally accrues to

the importer. Such quota profits, reflecting the scarcity of imports, may lead to "overcrowding" in the industry through the establishment of firms for the sake of sharing the quota profits.[28] They may also provide inducements for bribery aimed at obtaining import licenses.

These considerations point to the superiority of tariffs over quantitative restrictions, when this superiority increases in line with the sophistication of the industrial structure. At the same time, statements that tariffs will not suffice to limit imports of luxury consumer goods reflect a lack of appreciation of the responsiveness of demand to high prices. Also, since that licensing or the prohibition of imports of luxury goods provides an inducement for their domestic production at high costs, they should be applied in exceptional cases only.

Alternative Incentive Schemes and the Threat of Retaliation

We have indicated that the equality of benefits derived from domestic and foreign sales calls for providing identical incentives to import substitution and to exportation in the industries of developing countries. Import protection and export subsidization in these countries also have symmetrical effects on foreign industry, which will be adversely affected in its export markets in the first case and in its domestic markets in the second.

There are differences, however, in the international acceptability of these types of measures. While import protection is generally considered to be within the purview of every country, foreign nations may apply retaliatory measures in cases where export subsidies have been granted. The possibility of retaliation will be discussed in the following section in reference to the rules of the General Agreement on Tariffs and Trade (GATT) and to the practices followed in the principal developed countries.[29]

GATT Rules on Export Subsidies

Article XVI, Section A, of the General Agreement[30] states that any country providing subsidies that directly or indirectly increase exports has the obligation to inform the Contracting Parties (that is, the GATT secretariat) of "the extent and nature of the subsidization, of the estimated effect of the subsidization on the quantity of the affected product or products . . . exported from its territory and of the circumstances making the subsidization necessary." Furthermore, "in any case in which it is determined that serious prejudice to the interests of any other contracting party is caused or threatened by any such subsidization, the contracting party granting the subsidy shall, upon request, discuss with the other contracting party or parties concerned, or with the Contracting Parties, the possibility of limiting the subsidization."[31]

There is thus an obligation to notify and to discuss the imposition of export subsidies. Moreover, under Article VI, importing countries may offset export subsidies by countervailing duties. Such duties may be imposed in an amount not exceeding the estimated subsidies, subject to the condition that the subsidies "cause or threaten material injury to an established domestic industry, or . . . retard materially the establishment of a domestic industry."

The Meaning of Export Subsidies

In view of the threat of countervailing action to export subsidization by developing countries, one needs to examine what is meant by export subsidies under GATT rules. Section A of Article XVI is said to apply to "any subsidy, including any form of income or price support, which operates directly or indirectly to increase exports of any product." According to a later interpretation, "the phrase 'increased exports' was intended to include the concept of maintaining exports at a level higher than would otherwise exist in the absence of a subsidy." The Panel of Experts appointed by GATT to examine the application of Article XVI, endorsed this interpretation while adding, "it [is] fair to assume that a subsidy which provides an incentive to increased production will, in the absence of offsetting measures, e.g., a consumption subsidy, either increase exports or reduce imports."[32]

The conclusions of the panel, whose report has been adopted by the Contracting Parties, are consistent with Article VI:3 of the General Agreement, which empowers the governments of the importing countries to apply countervailing duties to offset subsidies "granted, directly or indirectly, on the manufacture, production or export of [a] product." At the same time, neither the GATT regulations nor their interpretation by the panel excludes the application of export taxes on raw materials; it is thus possible to subsidize indirectly the exportation of processed goods using such materials.

Concerning the notification of subsidies on exports, the Panel of Experts further stated that "the question of notifying levy/subsidy arrangements depends upon the source of the funds and the extent of government action, if any, in their collection." In particular, "there was no doubt that there was an obligation to notify all schemes of levy/subsidy affecting imports or exports in which the government took a part either by making payments into the common fund or by entrusting to a private body the functions of taxation and subsidization with the result that the practice would in no real sense differ from those normally followed by government." This is contrasted

with the case in which "a group of producers voluntarily taxed themselves in order to subsidize exports of a product."[33]

The criterion of loss to the government would include the loss of revenue—for example, through rebates of income taxes or exemptions from such taxes payable on exports. The Notes and Supplementary Provisions relating to Article XVI, specify, however, that "The exemption of an exported product from duties or taxes borne by the like product when destined for domestic consumption, or the remission of such duties or taxes in amounts not in excess of those which have accrued, shall not be deemed to be a subsidy."[34] The latter provision has been interpreted as applying to duties and indirect taxes levied on products both at the final stages of fabrication and at the earlier stages.[35] This interpretation has been endorsed by the contracting parties that have subscribed to the subsidy code in the framework of the Tokyo Round of Multilateral Trade Negotiations. The annex to the subsidy code further provides an illustrative list of export subsidies, adding that "any other charge on the public account constitute[s] an export subsidy in the sense of Article XVI of the General Agreement."[36]

Countervailing Actions in the United States

The next question concerns the application in the developed countries of GATT rules on export subsidies granted by the developing countries. Until the implementation of the agreements reached in the framework of the Tokyo Round, the imposition of countervailing duties did not require a finding of injury to domestic industry in the United States. Indeed, the U.S. Treasury was required to impose such duties once the foreign exporter was found to have received a subsidy. Nevertheless, until 1967, countervailing action was taken in a few instances only, and there were no such cases between 1959 and 1967. There were, however, an increasing number of petitions for the application of countervailing duties after 1967, some of which led to positive findings.

The rarity of positive findings before 1967 reflected the Treasury's apparent desire to avoid, whenever possible, the application of countervailing duties for international political reasons. Some petitions were dismissed on the grounds that they were *de minimis* in the sense that the rate of the subsidy was small; others encountered considerable delay, or decisions were postponed indefinitely since the Treasury was not subject to a time limit on reaching a decision. These practices benefited developing countries in particular.

The situation changed in the late 1960s when import competition intensified as a result of multilateral tariff reductions and the increasing overvaluation of the dollar. The newly assumed protectionist stance of labor contributed further to this change, as did the growing awareness of management that other firms had filed successful petitions for countervailing duties. Correspondingly, there was increasing political pressure on the Treasury from special interest groups and from Congress to levy countervailing duties, irrespective of whether they concerned imports from developed or from developing countries.

Between 1967 and 1974, countervailing duties were imposed in seventeen cases, of which only four involved developing countries (tomato products from Greece, shoes from Brazil and from Spain, and bottled olives from Spain). In several other instances—one of which was cut flowers from Colombia—countervailing action was dropped in exchange for the discontinuation of export subsidies.

The number of decisions continued to increase after the enactment of the Trade Act of 1974, which requires the Treasury to take action within one year on petitions for the application of countervailing duties. Among the sixty-five final decisions reached in 1975–77, there were thirty findings of injury. Countervailing duties were imposed in fifteen instances, including footwear from Korea and Taiwan and leather handbags from Brazil, while the duty was temporarily waived in fifteen cases, including carbon steel plates from Mexico, on the grounds that steps had been taken to eliminate the subsidies or substantially to reduce their adverse effects.

The developing countries were also affected by the provision in the 1974 Trade Act extending the scope of countervailing action to items which enter the United States free of duty, including those imported from developing countries under the Generalized System of Preferences. Finally, enforcement became increasingly strict, and in at least one case the criteria applied in imposing countervailing duties were modified to the detriment of foreign exporters.[37]

Developing countries will benefit, however, from the subsidy code adopted in the framework of the Tokyo Round, under which the United States has accepted the obligation of requiring a finding of injury before countervailing duties can be levied. And, while the transfer to the Commerce Department of responsibility for administering countervailing duty legislation may increase the vigor of its practical application, the assumption of policy responsibilities by the Office of the U.S. Trade Representative can be expected to have the opposite effect.

Countervailing Actions in Western Europe

European countries conform to GATT rules in requiring a finding of injury for the imposition of countervail-

ing duties. Thus, Regulation No. 459/68 of April 5, 1968, by the Commission of the European Economic Community (Common Market or EEC), concerning the application of antidumping and countervailing duties, closely follows Article VI of GATT. So far, there has not been a single case in which countervailing duties would have been imposed by Common Market countries on exports from developing countries.

Nonetheless, the future application of countervailing duties is by no means excluded. In the Common Market countries the view has repeatedly been expressed that export subsidies by developing countries should not exceed certain (unspecified) limits. For one thing, subsidies are said to distort international competition. For another, it is alleged that subsidy measures may be ill advised from the point of view of a particular developing country or group of developing countries, given the budgetary cost of subsidization, the transfer element involved in reducing the prices paid by developed country consumers, and the waste of resources that could result if developing countries were to compete in subsidizing their exports.

Export subsidization may also come into conflict with the application of the Generalized System of Preferences (GSP) by the Common Market. According to a communication from the EEC Commission to the Council,

> It will need to be appreciated on both sides that a policy of cooperation which provides advantages to the beneficiary countries implies as well both rights and obligations. Juridically, the preferences remain autonomous; and they bear no requirement for reciprocity. But they must be fitted into an international economic framework which permits the beneficiary countries to use the preferences to the full while respecting a certain number of economic and trade disciplines.[38]

This statement may be interpreted as relating to the application of export subsidies by developing countries which export to the Common Market under the Generalized System of Preferences. It then raises the possibility that duty-free treatment under the GSP will be limited in cases when subsidies have led to the rapid expansion of the exports of a particular commodity or commodity group.

Different considerations apply to export subsidization by the developing partner countries that have free access to EEC markets for manufactured goods under the Lomé Convention.[39] Given the small size of the manufacturing sectors of these developing countries, there is little danger of injury to European industry, even if their exports were to expand rapidly. In fact, at their present level of economic development, most developing partner countries cannot fully exploit the advantages of their duty-free entry status.[40]

Other European nations, too, follow GATT rules in requiring a finding of injury before applying countervailing duties. And although Japan has no legislation on countervailing action, it employs other measures to limit import competition.

Policymaking under the Threat of Retaliation

We have seen that the United States has increasingly taken countervailing action against export subsidies in recent years, and indications are that the relevant regulations will be applied with increased vigor in the future. The introduction of an injury clause in countervailing duty legislation, however, and the assumption of policy responsibilities by the Office of the U.S. Trade Representative will benefit the developing countries.

European countries and Japan have not yet taken countervailing action against developing country exporters. Given their increased preoccupation with imports of manufactured goods from developing countries, however, there is the danger of future application of such actions. Also, the existence of subsidies may provide a convenient excuse for applying other protective measures on the products of larger developing countries that have been successful in rapidly increasing their manufactured exports.

The chances of retaliation will depend, first of all, on the market for which exports are destined. It will also depend on the level of development of the exporting country, its size, and its ties with the importing nations. The countries associated with the Common Market are favored in all these respects as far as their exports to the EEC are concerned. They are small countries at a low level of development and are granted special privileges by reason of that association. Small exporters to the United States also benefit because there is less of a tendency on the part of domestic producers to initiate countervailing action if the amount in question is small. For one thing, the impact of imports on their activities will be small; for another, countervailing action involves an administrative cost as well as uncertainty, especially in cases when the *de minimis* clause may be applicable.

The preceding considerations indicate that the danger of retaliation tends to be less for developing countries at lower levels of industrialization that export goods in relatively small quantities. These countries also benefit under the new subsidy code, which limits their obligations in matters of export subsidization. Larger developing countries, particularly those at higher levels of industrialization, are exposed to the threat of retaliation.

In cases when the danger of retaliation exists, it is in the interest of the countries concerned to minimize this

danger. They can do so by replacing, to the extent possible, direct export subsidies by indirect subsidization through appropriate exchange rate and tax arrangements, and by relying on such direct subsidy measures that are not open to retaliation.

Alternative Incentive Schemes

Earlier in this chapter, we indicated the desirability of providing preferential treatment to manufacturing relative to primary activities, and of imposing export taxes on commodities facing less than infinitely elastic foreign demand. The proposed system of incentives can be implemented in several ways, three of which are compared here.

Under Alternative A, differential incentives are provided by applying the official exchange rate to exports such as copper facing less than infinitely elastic demand, and by imposing import tariffs and export subsidies on other primary products as well as on manufactured goods, with higher rates applying to the latter. Assume that in a particular case, optimum tariff considerations and external economies in the manufacturing sector would warrant setting import tariffs and export subsidies at 25 percent for primary products other than copper, and at 40 percent for manufactured goods.

Under Alternative B, domestic prices and relative incentives, as well as the allocation of resources and the impact on the government budget, will be the same as under Alternative A if the official exchange rate is set 25 percent higher and is applied to primary products other than copper, while a 20 percent export tax is levied on copper, and manufactured goods are subject to tariffs and export subsidies of 12 percent.

Under Alternative C, the economic and fiscal effects will again be the same, but the official exchange rate will be 40 percent higher than under Alternative A if manufactured goods are traded at the official exchange rate, a 28.6 percent export tax is levied on copper, and a 10.7 percent export-tax-cum-import-subsidy is applied to other primary products.

Although the three alternatives described above have identical effects on trade, resource allocation, and the government budget, they are likely to invoke different responses from the developed countries. Alternative B is less likely to provoke retaliation than the first set of measures, while Alternative C will be superior to the other two since it does not involve explicit subsidies to exports.

Alternative C may appear farfetched, since manufactured goods would neither be subject to tariffs nor receive export subsidies. However, various elements of this alternative have been used by developing countries. Export taxes have been increasingly employed, and some developing countries have also subsidized the importation of certain staples.

Nevertheless, noneconomic considerations may hinder the application of Alternative C in a particular country. Should this be the case, the use of explicit export subsidies could not be forgone. Developing countries may then minimize the danger of retaliation by developed nations by relying on measures that traditionally have not been considered export subsidies or that have been used by the developed nations themselves. Such measures may also be used to promote new export activities on a temporary basis.

To begin with, duty rebates on imported inputs used in export production are admissible under GATT. Such rebates improve the profitability of exports relative to domestic sales. But there will still be a bias in favor of import substitution unless the amount of the tariff rebate exceeds the tariff paid on the product itself. This is unlikely to happen, since tariffs have a tendency to escalate in the developing countries, and the rebate applies only to the items imported.

Take, for example, the case where, in world market prices, the value of the product is 100 pesos, imported inputs are 30 pesos, domestically purchased inputs competing with imports are 20 pesos, and value added 50 pesos. Assume further that a 20 percent tariff on the output will raise the domestic price of the product to 120 pesos, while a 10 percent input tariff will raise the cost of imported inputs to 33 pesos and that of domestic inputs competing with imports to 22 pesos. The effective protection of production for domestic markets will now be 30 percent; at the same time, despite a tariff rebate on imported inputs used in exporting, exports will receive negative effective protection of -4 percent.[41]

If exporters are free to choose between domestic and imported inputs, the effective protection of the export activity will be nil since the output will be sold, and the inputs purchased, at world market prices. But there will still be a bias against exports, since sales in domestic markets enjoy an effective protection of 30 percent.

Exempting exports and their inputs from indirect taxes will not provide advantages to exports over import substitution in countries where the so-called destination principle of indirect taxation is applied. This principle entails levying indirect taxes on goods consumed domestically, whether they are of domestic or of foreign origin, and rebating indirect taxes paid on exports and their inputs.

Nonetheless, exports will become more profitable if a country that has applied indirect taxes on imports introduces rebates of these taxes for exporters. In removing the tax element from the export price, the rebate will establish tax neutrality by equalizing the tax burden on sales in domestic and in foreign markets.

Various institutional measures benefiting exports have been widely employed without inviting retaliation. They include the collection of information, market research, the organization of trade fairs, and various other services that may be provided by quasi-governmental bodies. Furthermore, developing countries may make use of measures on which there is no agreed interpretation of GATT rules.

Developing countries may also lessen the danger of retaliation by using subsidy measures that have been employed by developed nations, such as preferential export credits, credit guarantees on export sales, and deferrals of tax liability on income from exports. But even though U.S. exporters also benefit from such provisions, these measures could not be recommended for exports to the United States, which has countervailed preferential export financing as well as schemes of income tax deferrals.

Transitional Measures

The suggested scheme of incentives calls for levying export taxes on commodities facing less than infinitely elastic foreign demand and, as a general rule, providing equal incentives to value added in all manufacturing activities at relatively low rates whether sales are made in domestic or in foreign markets. Exceptions to this rule would be made only when it can be established that external economies differ from the average, or when consumers have an irrational preference for foreign goods. Also, on a temporary basis, additional incentives may be granted to infant industries. Finally, cases where the exports of some manufactured goods face less than infinitely elastic foreign demand may necessitate the imposition of export taxes.

Implementing the Proposed Incentive Scheme

The described scheme may find application in a country at an early stage of industrialization, when its options for incentive policies are still open. It may also be implemented with relative ease in countries where protection levels are low. In turn, the scheme represents a long-term objective for countries that have industrialized behind high protection. In such countries, it would have to be reached over time, and the route taken will depend on the particular circumstances of the situation, with economic as well as political factors affecting the decisionmaking process. Nevertheless, some general guidelines may be devised.

The following discussion considers the case when rates of import protection on manufactured goods are high and varied, subsidies to exports of manufactures are provided at lower rates than tariffs, and there are no export taxes or import tariffs on primary products. In such a situation, the reform of the system of incentives may involve, first, undertaking a partially compensated devaluation and imposing optimal export taxes and, second, modifying existing measures of import protection and export subsidies over time, according to a program determined in advance.

Optimal Export Taxes and a Compensated Devaluation

A fully compensated devaluation would involve reducing import tariffs (providing import subsidies) and lowering export subsidies (imposing export taxes) at rates commensurate with the devaluation, so as to maintain domestic prices unchanged.[42] To maintain domestic prices unchanged in the event of a devaluation of 25 percent, for example, a 50 percent import tariff should be reduced to 20 percent, a 10 percent export subsidy replaced by a 12 percent export tax, and a 20 percent export tax–import subsidy scheme introduced on products that were not previously subject to import tariffs and did not receive export subsidies.

A fully compensated devaluation would have the advantage of lessening the danger of retaliation by importing countries, since explicit export subsidies would be replaced by implicit subsidies. It would, however, reproduce the existing, inefficient, structure of incentives that is not desirable. Rather, one should take the opportunity provided by the devaluation to improve the system of incentives. This may be accomplished by setting optimal export taxes and reducing differences in incentives between primary and manufacturing activities, as well as between import substitution and exports.

In most developing countries, all primary exports are implicitly taxed at equal rates through the overvaluation of the exchange rate relative to a free-trade situation. This is the case since, with imports reduced by protection, balance of payments equilibrium is reached at a lower exchange rate (in terms of domestic currency per dollar) than under free trade. Thus, exporters of primary products receive less domestic currency for a dollar earned under protection than under free trade.

However, as noted above, differences in the elasticity of foreign demand among primary commodities call for the differential treatment of primary exports and primary products in general. This purpose would be served if optimal export taxes were levied on products facing less than infinitely elastic foreign demand, at rates determined on a product-by-product basis, while other primary products were not made subject to tax.[43] The efficiency of resource allocation would improve, since existing disincentives to primary commodities where the country is a price taker in world markets would be

reduced, while taxes on export commodities facing less than infinitely elastic demand would be set on the basis of foreign demand (and domestic supply) conditions.

Reducing the bias against exports in manufacturing industries would further improve efficiency. This may be accomplished if the devaluation is accompanied by commensurate reductions in import tariffs while manufactured exports are not made subject to export taxes and, if conditions permit, export subsidies are not modified.

The partially compensated devaluation proposed here would lead to increases in the domestic prices of manufactured exports and of primary products other than those facing less than infinitely elastic world demand. The ensuing improvements in the balance of payments, associated with the higher exports generated by the increased incentives, would eventually permit lowering tariffs by more than the extent of the devaluation, which would further improve the efficiency of resource allocation.

Reforming Import Protection and Export Subsidies

Additional tariff reductions should be considered as part of the reform of import protection in which tariffs would replace quantitative restrictions and differences in tariff rates would be reduced among individual commodities. The need to replace quantitative restrictions with tariffs has been considered above and does not require further discussion. It would further be desirable to reduce tariff disparities that have given rise to inefficiencies and occasionally even to negative value added at world market prices, with the foreign exchange cost of the inputs exceeding the foreign exchange saved through import substitution.

Since import tariffs typically exceed export subsidy rates, tariffs should be equalized in a downward direction. At the same time, large reductions in *net* tariff rates (tariff rates adjusted for exchange rate changes) cannot be made instantaneously. Apart from opposition from vested interests, which may jeopardize the success of a compensated devaluation if it is accompanied by substantial tariff reductions, the possibilities of industrial dislocation favor the adoption of a gradual approach.

Such an approach would involve setting long-term tariff targets, to be reached through annual changes. To reduce uncertainty and to provide incentives for firms to adjust their operations to target levels of protection, both the targets and the projected annual changes should be made public in advance. Furthermore, safeguards would need to be provided involving, for example, the postponement of the next round of tariff reductions if the preceding one has led to reductions in industrial production. In cases where tariffs are high and vary greatly among industries, one may proceed in two stages, by establishing interim targets to be reached over a period of, say, five years. This alternative would reduce opposition to tariff reductions and would permit a learning process to take place among producers as well as the authorities. The experience of the first period of adjustment may then be used in setting targets for the second stage.

Efficiency in resource allocation would also require equalizing export subsidy rates and, eventually, equating import tariffs and export subsidies. At the same time, reforms in the system of tariffs and export subsidies would need to be accompanied by changes in the exchange rate to ensure that balance of payments equilibrium is maintained.

Apart from offsetting the effects of changes in import tariffs and in export subsidies on the balance of payments, developing countries that experience rates of inflation higher than those of the developed nations are well advised to follow a flexible exchange rate policy, the aim being to maintain the real exchange rate—the nominal exchange rate adjusted for changes in relative prices at home and abroad—constant. This can be accomplished by devaluing in line with domestic inflation adjusted for changes in foreign prices.

In keeping the real exchange rate constant, one may avoid the adverse effects of the inflation-devaluation cycle (continuing inflation accompanied by periodic devaluation), which leads to abrupt shifts in resources and creates uncertainty for the exporter because of unpredictable changes in the domestic currency equivalent of foreign exchange receipts. Real exchange rates would need to be adjusted, however, in the event of structural changes in the country's balance of payments, such as might be caused by shifts in export demand. But exchange rates should not be varied in response to temporary changes in the balance of payments, so as to avoid shifts in resources that involve an adjustment cost. Thus, fluctuations in the prices of a country's major exports should be handled by the accumulation and decumulation of foreign exchange reserves and by short-term investments and borrowing in international capital markets, rather than by exchange rate changes.

Apart from improving the efficiency of resource allocation, the application of the proposed measures would increase employment through a shift from relatively capital-intensive import substitutes to labor-intensive exports. Increases in employment, together with reductions in monopolistic excess profits in import-substituting industries and higher prices to agricultural producers, would also improve the distribution of income in most developing countries. Furthermore, the

growth performance of the economy would improve as resources were reallocated and new investments undertaken, in line with the country's comparative advantage.

Conclusion

In this chapter, recommendations have been made for establishing appropriate incentive schemes in developing countries and for reforming the system of incentives in countries that have established an industrial base behind high protection. The recommendations aim at improving resource allocation and accelerating economic growth by removing, or reducing, distortions in factor and product markets. The proposed measures would also tend to increase employment and improve the distribution of income.

Distortions in capital markets may be due to governmental action as well as to the undeveloped state of these markets. Reducing the rate of inflation, increasing real interest rates, and eliminating credit rationing would improve the allocation of credit among potential borrowers and contribute to higher savings. These measures would have to be accompanied by improvements in the institutional structure of credit markets.

Eliminating credit rationing that favors large capital-intensive import-substituting projects, at the expense of the labor-intensive activities of small and medium-size producers, would also contribute to higher employment and would improve the income distribution. In labor surplus economies, subsidies on the use of unskilled labor and more rational pricing of public utilities would further increase employment and improve income distribution, while contributing to efficient resource allocation.

In regard to trade policy measures, a scheme of "ideal" incentives has been put forward. This would involve applying optimal export taxes on commodities that face less than infinitely elastic demand abroad and, with temporary exceptions, providing equal incentives to value added in all manufacturing activities at relatively low rates, whether sales are made in domestic or in foreign markets.

The steps to be taken for reforming the existing structure of incentives in semi-industrial developing countries have also been indicated. They would entail, first, a partially compensated devaluation, involving the imposition of optimal export taxes, together with a reduction of differences in incentives between manufacturing and primary activities and between sales in domestic and in foreign markets. This would be followed by the replacement of quantitative restrictions by import tariffs, reductions in the level and the dispersion of tariffs, and eventually the equalization of tariff and subsidy rates.

The proposed measures would improve the efficiency of resource allocation and growth performance while increasing employment opportunities through a shift from relatively capital-intensive import substitution to labor-intensive exports. At the same time, a partially compensated devaluation would allow subsidies to be provided to nontraditional exports indirectly, through a more favorable exchange rate that is not subject to retaliation by the importing countries.

The threat of retaliation would be reduced further if, in cases where explicit export subsidies could not be forgone, use was made of duty and tax rebates, export credits and guarantees, and various export services that are internationally acceptable. At the same time, international limitations on the use of export subsidies provide an additional argument for lowering tariffs.

The proposed reform of the system of incentives cannot be achieved overnight. Apart from opposition on the part of vested interests, the possibility of industrial dislocation make a gradual approach advisable. To reduce uncertainty and provide incentives for firms to adjust to the new situation, it would be desirable to proceed according to a schedule determined in advance, and to publicize the targets to be reached as well as the steps by which they are to be reached.

Notes to Chapter 4

1. Citations will be kept to a minimum in this chapter, but it will be apparent that the chapter is indebted to the following studies: J. N. Bhagwati and V. K. Ramaswami, "Domestic Distortions, Tariffs and the Theory of Optimum Subsidy," *Journal of Political Economy*, vol. 71 (February 1963), pp. 44–50; H. G. Johnson, "Optimal Trade Intervention in the Presence of Domestic Distortions," in *Trade, Growth and the Balance of Payments: Essays in Honor of Gottfried Haberler*, ed. R. E. Baldwin and others (Amsterdam: North-Holland, 1965); J. N. Bhagwati, "The Theory and Practice of Commercial Policy: Departures from Unified Exchange Rates" (Princeton, N.J.: Princeton University International Finance Section, 1968); R. I. McKinnon, *Money and Capital in Economic Development* (Washington, D.C.: Brookings Institution, 1973); and E. S. Shaw, *Financial Deepening in Economic Development* (New York: Oxford University Press, 1973).

2. McKinnon, *Money and Capital in Economic Development*, p. 8.

3. Even in Brazil, where indexing was extensively used, demand deposits were not indexed.

4. McKinnon, *Money and Capital in Economic Development*, p. 106.

5. See G. T. Brown, *Korean Pricing Policies and Economic Development in the 1960s* (Baltimore, Md.: Johns Hopkins University Press, 1973).

6. Shaw suggests that "the reason . . . for the wallflower role of the monetary system is that the real size of the system has been depressed by deposit rate policy, that there is excess demand for monetary savings at subsidy rate of interest, that a market mechanism for allocation cannot survive in this context, and that dictated allocation is a political function . . . One purpose of monetary deepening is to overwhelm the rationing mechanism of repressed finance, substituting a pricing mechanism and decentralized judgment in ranking competitive bids for savings" (*Financial Deepening in Economic Development*, p. 137).

7. J. Harris and M. Todaro, "Migration, Unemployment, and Development: A Two-Sector Analysis," *American Economic Review*, vol. 60 (March 1970), pp. 126–42.

8. For a proposal to this effect, see the documents prepared by the Junta of the Andean Common Market: Junta del Acuerdo de Cartagena, "Orientaciones Generales para la Elaboracion del Arancel Externo Comun" (Lima, October 1973; processed); and "Aplicacion del Criterio del Emples en el Arancel Comun" (Lima, November 1974; processed).

9. Consumer surplus, the difference between the price the consumer would be willing to pay and that actually charged, needs to be taken into account because economies of scale are involved in the production of public utilities.

10. The elasticity of foreign demand for the country's exports (η_x) will be determined by the world demand elasticity (η_{xw}), the country's share in the world market (k), and the supply elasticity of competing suppliers (ϵ_{xw}). Thus $\eta_x = \eta_{xw} + (1-k)\,\epsilon_{xw}/k$. Introducing the supply elasticity of competing suppliers permits one to take into account the reactions of the country's competitors. The formula needs to be adjusted if there is collusion between some or all suppliers.

11. For the relevant formulas, see H. G. Johnson, "Alternative Maximization Policies for Developing Country Exports of Primary Products," *Journal of Political Economy*, vol. 76 (May–June 1968), pp. 489–93.

12. We disregard the political, military, and social reasons that have been invoked to rationalize the protection of manufacturing industries in some developing countries. The economist can do little more than attempt to quantify the economic cost of such policies.

13. Johnson, "Optimal Trade Intervention in the Presence of Domestic Distortions," p. 2.

14. An exceptional case is when the government, but not individual firms, foresees the imposition of quota restrictions abroad if exports expand rapidly. Cf. J. N. Bhagwati and T. Srinivasan, "Optimal Trade Policy and Compensation under Endogenous Uncertainty: The Phenomenon of Market Disruption," *Journal of International Economics*, vol. 4 (November 1976), pp. 317–36.

15. Some criteria have been put forth by the Junta del Acuerdo de Cartagena, "Aplicacion del Criterio del Emples en el Arancel Commun."

16. In the absence of distortions in factor markets, the market prices of factors will equal their shadow prices, and domestic value added will express the domestic resource costs of the particular activity. In turn, value added in world market prices represents the amount of net foreign exchange saved through import substitution or earned through exportation.

17. For a formal proof, see T. J. Bertrand, "Decision Rules for Effective Protection in Less Developed Economies," *American Economic Review*, vol. 62 (September 1972), pp. 743–47.

18. This conclusion applies also in the event of distortions in factor markets.

19. Johnson, "Optimal Trade Intervention in the Presence of Domestic Distortions."

20. See I. Little, T. Scitovsky, and M. Scott, *Industry and Trade in Some Developing Countries* (London: Oxford University Press, 1970), pp. 162–63.

21. The relationship between market size and the cost of protection may also explain the observed positive correlation between the level of protection and market size in the developed countries today. See B. Balassa, *Trade Liberalization among Industrial Countries: Objectives and Alternatives* (New York: McGraw-Hill Book Co., 1967), chap. 7.

22. Comparisons with the Soviet Union are of limited interest for this purpose, since it has become a centrally planned economy.

23. Lower target rates may be appropriate in semi-industrial developing countries in which the share of manufacturing in the gross national product approaches that in developed countries. For policy recommendations made in the case of Korea, see B. Balassa, *Policy Reform in Developing Countries* (Oxford: Pergamon Press, 1977), chap. 9.

24. To illustrate, take the case in which inputs account for half the world market value of output at every stage of transformation. A 5 percent tariff-cum-export-subsidy at the first stage of transformation, in which unprotected primary products are used as inputs, would now be equivalent to a 10 percent rate of effective protection. To obtain the same result at the second stage of transformation, nominal tariffs would have to be set at 7.5 percent, and at subsequent stages they would have to rise further, eventually reaching 10 percent.

25. See B. Balassa and D. Schydlowsky, "Indicators of Protection and Other Incentive Measures," in *The Role of the Computer in Economic and Social Research in Latin America*, ed. Nancy D. Ruggles and others (New York: National Bureau for Economic Research, 1974).

26. See B. Balassa, "Tariffs and Trade Policy in the Andean Common Market," *Journal of Common Market Studies*, vol. 12 (December 1973), pp. 176–95.

27. Junta del Acuerdo de Cartagena, "Aplicacion del Criterio del Emples en el Arancel Commun."

28. See A. O. Krueger, "The Political Economy of the Rent-Seeking Society," *American Economic Review*, vol. 64 (June 1974), pp. 291–303.

29. A more detailed discussion of some of the relevant issues is provided in B. Balassa and M. Sharpston, *Export Subsidies by Developing Countries: Issues of Policy* (Geneva: Graduate Institute of International Studies; and London: Trade Policy Research Centre, 1977).

30. General Agreement on Tariffs and Trade, *Basic Instruments and Selected Documents* [to be cited as BISD], vol. 4, *Text of the General Agreement* (Geneva 1969).

31. Section B of Article XVI, added in 1955, imposes a more stringent obligation on exporting countries than does Section A of the same article. Para. 4 contains the provision that "contracting parties shall cease to grant either directly or indirectly any form of subsidy on the export of any product other than a primary product." But only developed countries subscribed to this provision, and hence it does not apply to developing countries.

32. Review pursuant to Article XVI:5, Report by the panel adopted on May 24, 1960 (L/1160), BISD, 9th suppl., p. 191, para. 10.

33. These statements of the Panel of Experts appear ibid., p. 192, para. 12.

34. Notes and Supplementary Provisions, BISD, annex 4.

35. Provisions of Article XVI:4, report of Working Party adopted on November 19, 1960 (L/1381), BISD, 9th suppl. (Geneva, 1971), pp. 186–7, para.5.

36. The Agreement on Interpretation and Application of Articles VI, XVI, and XXIII of the General Agreement on Tariffs and Trade (Relating to Subsidies and Countervailing Measures) (Geneva 1979).

37. The Treasury imposed countervailing duties on imports of bromide and bromide products from Israel, the production of which benefited from regional assistance, even though Israel exports only 3 percent of its bromide commodities to the United States.

38. European Economic Community, *The Future Development of the European Community's Generalized Tariff Preferences*, Communication by the Commission to the Council (Brussels, January 1975).

39. The expression "partner countries" has replaced the term "associated countries" used in the past.

40. The EEC has nevertheless limited the imports of certain textile products from some developing partner countries.

41. If the differences between c.i.f. and f.o.b. prices are neglected, world market value added will be 50 pesos (100 − 20 − 30) in both cases. Domestic value added, however, will be 65 pesos in producing for domestic markets (120 − 22 − 33) and 48 pesos in producing for export markets (100 − 22 − 30).

42. If the rates of import tariffs and export subsidies were lower than the percentage of devaluation in the currency, import subsidies and export taxes would need to be introduced in order to maintain domestic prices unchanged.

43. In some cases, however, actual export taxes may exceed the rate of optimal taxation. In such instances, export taxes would need to be adjusted downward and allowance made for devaluation so as to reduce discrimination against traditional exports.

PART II

Incentive Policies and Economic Development: Case Studies

5

Argentina

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Argentina covers most of the southern cone of South America; its fertile grassy plains are famous sources of grain and beef. In 1969 Argentina had a population of approximately 23 million, of which about a third lived in greater Buenos Aires. Per capita income in that year was about US$900, but it had grown at only 2 percent a year since 1950. Although agriculture contributed about 13 percent of GNP and industry 33 percent, almost 80 percent of Argentina's exports were agricultural. Import substitution had proceeded so far that consumer goods made up less than 5 percent of imports, while raw materials and intermediate goods accounted for two thirds of the import bill.[1]

Argentina's economic history since World War II has been one of cyclical fluctuations around a path of relatively low growth, double-digit inflation in practically all years, and recurrent balance of payments crises. Underlying these features has been a persistent imbalance between the rates of growth of the primary and secondary sectors. While industry relied on imported inputs, the principal source of foreign exchange was agriculture. Industrial growth thus depended directly on agriculture, except insofar as industrial output itself either was exported or saved foreign exchange by substituting for imports. Policy was strongly oriented toward industrial import substitution, and also strongly biased against the production of industrial exports. As a result the sustainable excess of the rate of growth of manufacturing over that of exports was given by a steadily declining rate of import substitution. In practice, the growth of industry repeatedly exceeded this ceiling and balance of payments crises resulted.

The stabilization measures introduced to cope with these crises typically included devaluation (to promote primary exports and to contain imports) and tightening of money policy (allegedly to prevent inflation). These measures generally resulted in recession and inflation, and a temporary improvement in the balance of payments as economic activity was reduced. Prices tended to rise after devaluation, because Argentina's major exports are food products, and hence domestic food prices have been tied to international prices converted to Argentine pesos ($a). Many industrial prices had a similar link via imported inputs, or via competing products that were imported. The reductions in economic activity were the result, at least in part, of the fall in real wages arising out of the increase in the price of food. Tight money exacerbated the fall in aggregate demand. Short-run borrowing abroad or inflows of foreign private investment proved to be palliatives that did not fundamentally affect the situation. The possibility of lifting the ceiling on industrial growth by promoting industrial exports began to be explored in the early 1960s, while stabilization on the basis of an incomes policy that did not depress real wages was not attempted until the late 1960s. The remainder of this introduction gives a

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thumbnail sketch of developments since World War II. It is striking how repetitive the scenarios have been.

Argentina entered the postwar period with unusually high foreign exchange reserves, which resulted from the high prices its exports had fetched during the war and the unavailability of imported goods on which to spend the export revenue. The reserves were spent in the immediate postwar years on the purchase of railroads from the British, on the settlement of foreign debt, and on the imports needed to sustain a substantial increase in the standard of living of most Argentine citizens. In these years there was also a systematic and conscious effort at industrialization. Previous episodes of rapid industrial growth, during World War I, during the Great Depression, and during World War II, had been achieved in response to temporary interruptions of supply or temporary unavailability of foreign exchange. In early postwar Argentina, however, foreign exchange was plentiful and goods were available for import. Hence the industrialization of this period was caused less by external pressures and more by an explicit industrialization strategy.

By 1950 the country was moving toward a major balance of payments crisis as a consequence of two years of declining demand for its exports. In 1951 the increase in domestic prices began to accelerate and reserves fell significantly, the cost of living increased by 37 percent, and wholesale prices increased by 48 percent. Many of the measures that were adopted to deal with the balance of payments crisis have since been used to cope with similar crises. They consisted essentially of controls on aggregate demand through a policy of tight money. The system of multiple exchange rates was manipulated to produce an increase in the relative price of agricultural goods. Stabilization was undertaken by means of wage and price controls, which were helped along with subsidies from the exchequer. The result was a recession of some magnitude. Output temporarily fell, and wage increases lagged behind the rise in the cost of living. Simultaneously, foreign private investment was invited in to relieve the short-run need for foreign exchange. Although foreign exchange reserves improved in 1953, reflation began, real wages rose, and relative prices of agriculture fell. In 1954 the cost of living increase was down to 4 percent, but the stage was set for the next crisis.

The government that took office in 1955 addressed its inherited economic problems with a plan that included many of the same types of measures. The peso was devalued from $a8.8 to $a22 to the U.S. dollar (average implicit exchange rates in 1954 and 1955, respectively). Foreign private investment received substantial encouragement and the foreign debt was rescheduled. Part of the inflationary impact of the devaluation was offset by the imposition of export taxes, which limited both the increase in income to exporters and the fall in real wages. The increase in the cost of living was only 12.1 percent in 1955, rising slightly to 13 percent in 1956. Since the plan adopted was relatively expansionary, the recession induced by its early phase was a minor one. Throughout 1956 real wages rose and export taxes were reduced in an offsetting fashion. By 1957 the increase in the retail price level had reached 25 percent a year. The devaluation had caused only a minimal increase in agricultural output and exports, but there had been some increase in foreign private investment. During the late 1950s a general liberalization of the economy was undertaken: bilateral trading arrangements were terminated, many imports previously restricted were transferred to an automatic license list in the "official" market, and an attempt was made to control imports in the "free" market through import duties. (For goods produced domestically a certificate of need was required.) A surge of imports resulted, as stocks were adjusted to levels of demand that had been repressed in the past. When a balance of payments crisis emerged in 1958, Argentina had no reserves but an increased foreign debt.

In 1958 a new government took over and decreed a 60 percent wage increase over the level of February 1956. This increase was accompanied by an increase in the money supply of more than 40 percent, a deficit in the government budget equivalent to 5 percent of GDP, and an increase in the cost of living during that year of 32 percent. The immediate balance of payments problem was met by a vigorous reimposition of quantitative restrictions. In 1959 the government attempted to stabilize the economy according to a plan negotiated with the International Monetary Fund (IMF). This involved freeing the foreign exchange market, devaluing the peso to $a83 to the U.S. dollar, and tightening the money supply; it also included the introduction of tariffs, advance deposits in payment for imports, and export taxes. As might have been expected, the devaluation improved the agricultural terms of trade and decreased real industrial wages, which fell by around 20 percent between 1958 and 1959. Retail prices increased during 1959 by 113 percent and the recession in that year was worse than in 1952. The devaluation had little effect on exports but a major effect on inflows of capital, much of it on a short-term basis. In 1960, as a consequence of increases in Central Bank reserves, credit expanded and thus prompted some reflation of the economy, which gave room for an increase in nominal wages. This rapidly turned into wage push, which contributed to the 27 percent increase in retail prices in that year. This rate declined to 13.7 percent in 1961. Export taxes were lowered in order to maintain the competitiveness of the traditional export sector.

Most of the import substitution of the 1950s was in oil, steel, chemicals, and motor vehicles. The liberalization of the import regime in the late 1950s had a significant effect on imports of intermediate and capital goods. The latter received a particular impetus as a result of government incentives, principally exemptions from duties as well as income tax deductions. Argentina's average import requirement was not significantly changed by the import substitution undertaken, largely because of the growth in import volumes in response to import liberalization. Import substitution was also offset to some extent by the introduction of new import-intensive products into the demand structure.

By 1961 the Central Bank's reserves had started falling, and confidence in the stability of the exchange rate began to weaken. In April 1962 the foreign exchange rate was freed to find a new level; the outcome was a devaluation of 65 percent. The foreign exchange crisis also involved a massive outflow of short-term capital and the introduction of a tight monetary policy, so that the level of domestic activity fell.

Significant inflation followed the devaluation. Retail prices increased by 26 percent in 1962 and again in 1963. As before, the income of the agricultural export sector increased and real wages fell. In 1963 output fell again and foreign reserves increased, more because of a reduction of imports than an increase in exports. It was during this period (1963) that the first efforts were made to promote exports and to give preference to the purchase of local products.

The government that took office in 1963 reactivated the economy through expansionary monetary and fiscal policies. It was aided by a spectacular increase in agricultural output that pushed the country's exports from US$1,000 million in 1961 to US$1,600 million in 1966. In addition, some of the earlier investments in import substitution had begun to bear fruit. Pushed by an increase in money wages, the cost of living index rose by 22 percent in 1964 and 29 percent in 1965, to which the government responded by adopting a crawling peg exchange rate. Capacity utilization increased in response to the general expansion of the economy up to 1965 and 1966, when a tighter monetary policy was adopted to counter the cost-push inflation that arose from the increase in wages. Throughout this period, the policy toward foreign private investment was less favorable than it had been previously, as indicated by the cancellation of contracts with foreign petroleum companies.

Soon after assuming power, the new government of 1966 introduced a policy that was novel in two respects. First, it attempted to stabilize wages and prices on the basis of a freeze in the real income distribution of 1966; this action implied that the struggle for shares in the income distribution was temporarily suspended. An expansionary monetary policy was adopted in order to encourage fuller use of existing production capacity. The rate of increase in retail prices dropped from 29 percent in 1967 to 16 percent in 1968 and 7.5 percent in 1969, and production increased in the latter two years. Second, on the balance of payments side, the policy consisted of a partially compensated devaluation that raised the "financial" exchange rate by 40 percent from $a250 to $a350 per U.S. dollar. (The "financial" exchange rate fluctuated according to market conditions, and was distinguished from the "commercial" exchange rate.) For exports of traditional products, the devaluation was almost wholly offset by a tax, while the subsidy for nontraditional exports was removed; on the import side, reductions in tariffs did not fully offset the devaluation. The new exchange rate was announced to be fixed for all time, with no devaluations to occur ever again. Accordingly, inflationary cost increases in 1968 and 1969 were offset by a reduction of the export taxes and the reintroduction of the export subsidies. In 1969, the point at which we examine the incentive system in detail, prices were rising at 7.5 percent a year—their slowest rate in many years—and the level of economic activity was high.

Such stability was not to last long. In the following year, the peso was devalued from $a3.5 to $a4 to the dollar. Offsetting changes were made in trade taxation and a new attempt was made to implement a compensated devaluation. By the end of that year, the attempted compensation had in turn been abandoned, import duties went back to their earlier levels, and export incentives had been raised again. In 1971 there were further attempts to improve the export promotion system while some imports were banned altogether. The exchange rate was allowed to crawl from $a4 to $a5 to the U.S. dollar. Thereafter, the commercial exchange rate was set at $a5, and the financial rate fluctuated depending on the market. Exports were promoted by allowing an ever increasing proportion of the export revenue to be sold on the financial market. The import exchange rate was devalued by means of a 15 percent surcharge. The spread between the commercial and the financial exchange rates reached 100 percent in 1972, and the balance of payments problem became overt. The Central Bank's response was to "let the devaluations do their job," which implicitly meant a lowering of the real urban wage. The political authorities, principally the president, were not prepared to accept this consequence and thus raised wages as devaluation proceeded. The result was a race between the exchange rate and nominal wages, which led to inflation of 70 percent. In this period, balance of payments policy was further reinforced by a combination of prohibitions, informal licensing by the Central Bank, certificates of need issued by

the Ministry of Commerce, and other measures. Explicit subsidies and provisions for duty drawbacks were given over and above the mix of exchange rates. This general system lasted through 1973, when the balance of payments improved sharply owing to the rise in world prices of Argentina's exports. The new government immediately used the improved balance of payments position to expand demand and raise real wages. Production expanded rapidly on the basis of existing installed capacity. Price increases were held in check, in the first months with some success, through a general price freeze.

The boom, which lasted until early 1974, brought a sharp rise in real wages, output growth, and consumption, achieved mainly through idle capacity. Problems then appeared. First, world prices rose beyond the ceiling on domestic prices and put certain indispensable imports out of reach. Second, increases in domestic costs, caused by the rising prices of domestic primary output, were not recognized by the price control authorities, who maintained the price ceilings at their original levels. Third, the growing gap between costs and controlled domestic prices brought investment to a halt; in some instances production stopped altogether, since it became impossible to cover variable costs. Fourth, a dual domestic market appeared: a controlled market in which prices had little to do with supply and demand conditions, and a black market, initially serving only small enterprises, but eventually extending to the larger ones as well.

By the second half of 1974 the terms of trade began to turn against Argentina. The country's foreign exchange position had already begun to worsen, partly because of the increase in demand for imports that, typically for Argentina, had accompanied the expansion of output. In addition, the previous lack of investment began to make itself felt by raising the quantity of imports needed to maintain a given level of output. Further pressure on the balance of payments resulted from an increasing overvaluation of the exchange rate, motivated by the distributive policy being followed. These elements were compounded by a general overinvoicing of imports and underinvoicing of exports that corresponded to the structure of the exchange rates. Finally, developments in world markets—particularly difficulties with the traditional Argentine export markets in the European Economic Community—aggravated the situation further.

By mid-1975 Argentina was in the grip of a strong demand inflation and a virtual external moratorium. The attempted cure involved a strong devaluation averaging some 140 percent, combined with a lag in the rise of nominal wages, which was not supposed to exceed 30 to 50 percent a year. Labor union pressure, however, managed to achieve a rise in nominal wages of 150 percent—greater than the amount of the devaluation. The result was a jump in retail prices of about 140 percent within a short period, and a reversion of relative prices to their ratios before devaluation. Liquidity fell, of course, with a consequent fall in demand and reduction in output. Since relative prices remained unchanged, the government devalued further. Since union pressure became impossible to resist, salaries were raised as well, although gradually the exchange rate pulled ahead and somewhat eroded the purchasing power of wages.

Monetary policy became gradually easier and the recession began to ebb just as imports began to rise. A partial renegotiation of the foreign debt gave a breathing spell. By February 1976 real wages were considerably below those of June 1975, after a violent wage-price spiral that at its worst point had reached 1,000 percent a year. The economy had been reactivated to some extent, but the techniques of economic control and the mechanisms of economic policy had been rendered powerless because no policy was credible any longer. The last ministry of the Populist government tried once more to undertake a strong devaluation, but it was then replaced by a new government.

The stabilization of 1976 confronted the traditional problems: to solve the balance of payments constraint and to stop the inflationary spiral inherited from the previous period. The initial remedies included a change in relative prices, which involved lowering the real urban wage by more than had ever been previously attempted, while incentives were provided to the rural sectors. Despite another recession in the first months of the stabilization, a devaluation–nominal wage spiral persisted and was tolerated to avoid too deep a recession and the consequent unemployment. Industrial exports had their incentives much reduced when the exchange market was unified. Since the rate of inflation proved resistant to the stabilization, the government reinforced its policy with a wage-price truce, informal price controls, and moral suasion of various kinds.

In December 1978 a new policy package was unveiled, which attempted to stop inflation and simultaneously restructure activity. The cornerstone of the policy is to render domestic production competitive with imports, with a preannounced rate of crawl in the exchange rate and substantially lower tariffs. The official inflation goal is to reduce domestic inflation to the rate of world inflation plus devaluation. By early 1980 the policy succeeded in bringing the annual rate of inflation down from a plateau of about 170 percent to below 100 percent, but caused a considerable cost squeeze for a large part of industry, since changes in the exchange rate lagged behind domestic prices, and import protection was reduced.

The figures in the remainder of this study refer to

1969. Economic conditions in Argentina have changed somewhat, particularly since the recent changes in tariff rates. But the central concerns of policy are still the same: how to set relative prices inside the Argentine economy so as to keep the economy stable and growing.

Components of the Incentive System, 1969

Nominal Protection of Imports

Argentina's system of import restrictions in 1969 consisted of tariffs, official customs valuation, advance deposits for imports, and preferential arrangements with the Latin American Free Trade Area (LAFTA). In addition, special import regimes existed for a number of industries.

The main tool for restricting imports—import tariffs—applied to some 6,000 items under a scheme adopted in the 1967 tariff reform. That reform grouped commodities according to: (1) economic classification (whether investment, intermediate, or consumption goods); (2) extent of import competition (whether not produced domestically, or produced domestically in competition with imperfect foreign substitutes or close foreign substitutes); and (3) degree of fabrication (ten commodity categories). "Escalation" was built into the tariff structure. Tariffs were generally set higher on consumption than on capital goods; higher on close foreign substitutes for domestic products than on less close substitutes; and higher also on products at high degrees of fabrication.

Official customs valuation served a supporting role, the stated purpose being to prevent the ad valorem tariffs from being eroded through underinvoicing by importers. Approximately 900 positions in the Brussels Tariff Nomenclature (BTN), or 14 percent of the items subject to tariff, were completely or partly subject to official customs valuation. For these items the actual protective effect of the tariff depended on the relation between the c.i.f. price and the official customs valuation, since the higher of the two was used as the basis for levying the tariff.[2]

Advance deposits on imports reinforced the tariff and official price system. In 1969 about 3,800 BTN positions were subject, wholly or partially, to advance deposits of 40 percent of the c.i.f. value of imports for a period of six months. Since the required funds could usually be borrowed, the tariff equivalent of the deposit was the nominal interest cost incurred, which we have estimated to be 3.6 percent of the c.i.f. price across the board. These requirements probably had a small effect on the level of imports and on domestic production.

Preferential tariffs existed for imports of certain commodities from LAFTA. Some of these commodities—for example, automobiles and electronic components—were covered by complementarity agreements. Generally, imports from LAFTA did not determine the prices of imported goods at the margin or, consequently, rates of protection to domestic industry. In the few cases in which they did, the margin of preference was offset in large part by the higher c.i.f. prices of LAFTA suppliers, so that levels of nominal protection relative to the rest of the world again approximately equaled the third country tariff. In view of this situation, the analysis has proceeded on the basis of the general (third country) tariff rates.

The system of protection was further complicated by special import regimes. These regimes were basically of two types: the first allowed specified products to be imported free or partially free of the legal duty, while the second allowed specified institutions to import at lower or zero duties. The effect of these regimes was to create a set of dual commodity markets. One market grouped all the buyers who did not qualify for importing under special regimes. These buyers faced c.i.f.-plus-tariff prices if they wished to buy imports, or regular domestic prices if they wished to buy domestic products. The second market contained firms that qualified for special regimes on institutional grounds or that were buyers of commodities imported under special regimes. Because the market was segmented, imports under the special regimes had only indirect effects on domestic prices. By reducing the quantity of domestically produced import substitutes demanded at each price, they exerted downward pressure on domestic prices.[3]

A further consideration is that in 1969 many tariffs were prohibitive in Argentina. Tariff protection had existed long enough and at sufficiently high levels to allow the domestic price of many products to fall below the sum of the c.i.f. import price and the tariff, as a result either of competition among domestic producers or of the rational response of monopolistic or oligopolistic producers to the price elasticity of domestic demand. The net result was the simultaneous existence of tariff redundancy and domestic production that did not compete with imports. The structure of markets in Argentina is documented by a study of the concentration of production covering 145 five-digit sectors for 1964.[4] Altogether there were 20 highly concentrated sectors; 58 sectors were characterized by "competition of the few among the many"; and 67 were quite competitive by any standard.[5] In interpreting these results it should be noted that the distribution of output by five-digit sectors understates the true concentration of decisionmaking about output and pricing, since many Argentine industrial firms produce in more than one five-digit sector. For our purpose, however, the source of tariff redundancy is of less importance than its existence.

To take account of tariff redundancy in the estimates of the nominal protection afforded to imports, the commodities produced and consumed in the Argentine economy were classified into export commodities, import-competing commodities, non-import-competing commodities, and export-and-import-competing commodities (XIC). The basic criteria used for this classification, described in Chapter 1 and also used in the companion case studies, are the share of imports in total supply and the share of exports in total production. If more than 10 percent of its total supply was imported, a commodity was considered import-competing, and if exports exceeded 10 percent of production it was considered an export commodity. For commodities that were both exported and competed with imports, both these shares exceeded 10 percent. Non-import-competing commodities are those in which less than 10 percent of production and consumption was traded internationally. After commodities had been aggregated into sectors, this classification was applied to 257 sectors at the five-digit ISIC level. It was found that, in world prices, 48 percent of Argentine value added was produced in export sectors, 14 percent in import-competing sectors, 37 percent in non-import-competing sectors, and less than 1 percent in XIC sectors, which both exported and competed with imports.

Distinguishing trade categories on the basis of the share of imports in total supply obviously takes no account of the fact that a part of the imports competing with domestic products entered under special regimes, and thus had little effect on the domestic price level. Unfortunately, appropriate adjustment for this fact would require information on the demand curves in each segment of the market and on how they related to each other.

The resulting overstatement of the share of competitive imports is partially offset, however, by the understatement that results from using the c.i.f. price of imports rather than the landed—c.i.f. plus tariff—price, a difference of 2 to 87 percent, depending on the sector. Furthermore, tests in which the benchmark for defining import-competing products was raised from 10 to 15 percent of total supply caused little change in the number of import-competing commodities and thus revealed a certain stability in the classification.

The identification of commodities for which tariffs were redundant was undertaken in several steps. Non-import-competing commodities were identified from the 1963 Census of Manufacturing. Information on their domestic and c.i.f. prices was then taken from a survey of 1,000 firms that was conducted by the Ministry of Economics in 1969. This survey had complete information for 264 products (111 final goods and 153 intermediates); for another 51, mainly chemical and electromechanical products, it was possible to compare domestic and c.i.f. prices with the help of specialist engineers. Price comparisons for 57 additional intermediate goods were taken from an earlier study on effective protection carried out with the participation of one of the authors. The comparisons were matched to commodities and sectors, and estimates of tariff redundancy were developed by analogy for commodities without price comparisons.[6]

The rates of nominal protection at the five-digit sector level have been constructed from the rates applicable to the commodities composing the sectors. Non-import-competing commodities have been assigned the nominal protection rates given by the price comparisons; all other commodities have in the first instance been assigned their legal tariff rates. For each five-digit sector, the average rate was derived using the value of production at world market prices as weights. The rates at the five-digit level were then examined with regard to their consistency, and technicians and experts were asked to judge their plausibility, keeping in mind quality differences between domestic and imported products and the reliability of quoted c.i.f. prices. For export industries, nominal rates of protection were set at zero, or equal to the rate of export tax (subsidy). For XIC sectors, nominal rates were set at a weighted average of rates on exports and products for domestic use. A few other rates obviously out of line were also adjusted. We then proceeded to aggregate further to the three-digit and ten-industry classification level, using output weights at world prices.

Nominal Protection of Exports

Argentina's incentive system for nontraditional exports in 1969 consisted of several instruments. Traditional exports, including grains and animal products and derivatives, were subject to export taxes of 10 percent. The principal means of export subsidy was a tax reimbursement scheme, the *reintegro*; this was complemented by a duty drawback scheme, income tax deductions for part of export income, exemption from income tax of payments under the reintegro, and access to medium- and long-term credit at subsidized rates.

Tax reimbursement under the reintegro was governed by decree 9588 of 1967. It consisted of a flat 12 percent subsidy on the f.o.b. value of all nontraditional exports. This category included most manufactured products, but not those based directly on domestic raw materials, in particular the traditional exports of Argentina, grain and meat. Although decree 9588 established a positive list of BTN categories covered, inclusion could be petitioned for and rather easily obtained, so that this incentive was quite general in coverage. Since in theory the

tax reimbursement was supposed to return to the exporter the internal taxes paid at the various stages of production, any income the exporter received from such reimbursements was legislated to be free of income tax. With the corporate tax rate at a flat 33 percent, the taxable equivalent of this subsidy was 18 percent (thus, 12 percent is the after-tax value of an 18 percent subsidy subject to income tax).

The drawback system, as applied in 1969, had its legal foundation in decrees 8051 of 1962 and 9249 of 1963, the first of which applied to industry in general and the second only to the automobile industry. Exporters were entitled to reimbursement for tariffs paid by them and by their suppliers. The actual rate of reimbursement was established by petition on a per unit or weight basis; consequently the drawback as a proportion of the f.o.b. value of exports varied significantly from product to product and over time. For each product, the initial request for a drawback had to be supported by data on the tariffs paid at the last and at the immediately preceding stage of production. Once the rate of drawback for a particular product was determined, it applied to all exporters.

In the course of time, the drawback system came to protect the domestic suppliers of inputs to export producers. This is because there was no subsequent check on whether the imports on which duties were originally paid—and which constituted the basis for the drawback benefit—were still imported or whether they had since been replaced by domestic production. In some cases, domestic products had indeed replaced imports, and drawback benefits continued on tariffs once paid and no longer collected. Although this system represented a departure from the initial purpose of the drawback, the effects were beneficial since by ceasing to distinguish the cause of high input costs by source, the drawback scheme ceased to discourage domestic sourcing. Thus, in its actual operation, the Argentine drawback system had by 1969 removed to some extent one of the main disadvantages of such systems, namely, the incentive they provide for making export production import intensive.

The income tax status of drawback payments was unclear in 1969. The tax authorities regarded this income as taxable, the exporters claimed that it was not, and the issue went to the tax court. We adopted the authorities' view in our calculations.[7]

Since the drawback allowance accrued directly to exporters, we consolidated it with the amount of tax reimbursement. These two measures together were the converse of the taxation of traditional exports that is considered negative nominal protection. Nominal protection rates on exports, measured at the five-digit level, ranged from −16 percent on the salting and skinning of hides (29101) and inedible animal fats (31201) to 53 percent on iron and steel wire, including galvanized wire (34102). This last category represents a special case, since imported steel inputs paid no duties—coming in mainly under the duty exemptions of the national steel enterprise, SOMISA—while the drawback, based on the high input duties levied earlier, was the highest on record.

Decree 9610 of 1967 allowed exporters to deduct from their taxable income 10 percent of the f.o.b. value of their exports. The deduction applied regardless of whether the taxable income was earned from export or domestic sales. The corporate tax rate was a flat 33 percent, so that the subsidy amounted to 3.3 percent of the f.o.b. value or, after adjustment for one year's inflation, to 3.1 percent of the f.o.b. value.

Exports were also free of sales tax, under decree 3696 of 1960. The Argentine sales tax was in fact an industrial value added tax, and this exemption merely completed the application of the destination principle, under which goods are taxed at the point of consumption. Thus, there was no subsidy involved, and levying the sales tax on imports only made the application of the destination principle symmetrical.

In our computations, we show as nominal protection only the actual taxes or refunds and drawbacks due on export sales. The value of the tax-exempt status of the refunds is shown together with the direct income tax deduction as a tax incentive in calculating effective subsidy rates. The sales tax exemption is excluded throughout, since as noted above it does not affect the relative incentives between domestic and foreign sales.

The final component of the export protection system consisted of credit for export sales at subsidized interest rates. Since in Argentina's fairly well-developed money markets credit was always available, the real benefit from these credit schemes consisted of the interest subsidy. The measures in force during 1969 correspond to the Central Bank circulars 380, 502, and 344, which was replaced by 689 in September 1969.

Circular 380, established in September 1963, provided credit in Argentine pesos to nontraditional exports for periods of up to one year in amounts up to 60 percent of the f.o.b. value, at an interest rate of 8 percent. Commercial banks could rediscount the paper arising from these credits in the Central Bank at a rate of 3 percent. The total amount outstanding was subject to normal Central Bank regulations regarding the net assets of the borrower and the capital and reserves of commercial banks. In practice, these restrictions were severe and in 1969 only a negligible amount of credit was outstanding under the provisions of this circular.

Circulars 344/689 established financing for export sales after shipment of the merchandise by allowing

Table 5.1. *Argentina: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added			
				Balassa			Corden
	E	D	A	E	D	A	A
Agriculture, Forestry & Fishing (I)	-10	-10	-10	-13	-13	-13	-13
Mining and Energy (IV)	0	30	30	-12	33	32	26
Primary Activities (I & IV)	-10	-6	-6	-13	-8	-9	-9
Processed Foods (II)	-9	7	2	-30	44	24	35
Beverages and Tobacco (III)	-10	51	50	-448	95	87	70
Construction Materials (V)	12	29	29	4	31	31	27
Intermediate Products I (VIA)	-8	56	51	-26	146	132	109
Intermediate Products II (VIB)	-1	69	67	-118	9	122	96
Nondurable Consumer Goods (VII)	12	57	56	-10	50	48	42
Consumer Durables (VIII)	12	89	88	-113	145	144	112
Machinery (IX)	14	90	87	-2	120	117	105
Transport Equipment (X)	n.d.	109	109	n.d.	207	207	148
Manufacturing, less Beverages & Tobacco (II, V-X)	-7	58	51	-36	113	98	78
Manufacturing (II, III, V-X)	-7	57	51	-40	111	97	78
All Industries, less Beverages & Tobacco (I, II, IV-X)	-8	41	35	-19	54	46	40
All Industries (I-X)	-8	41	36	-20	55	47	49

loans in foreign currency at 6 percent a year. Maximum amounts and repayment periods varied according to the type of product or service. Thus, for capital goods, as much as 85 percent of the f.o.b. value could be financed for up to eight and a half years. Durable and semidurable consumer goods were entitled to finance of not more than 80 percent of the f.o.b. value for up to three years, whereas nontraditional exports generally could be financed for a maximum of 80 percent of their value for up to eighteen months.

Circular 502, issued in December 1965, established a special credit assistance program for nontraditional exports. It offered credit in Argentine pesos at 12 percent interest (compared with the prime bank rate of 19 percent) for not more than 180 days in amounts of up to 30 percent of export value.

Nominal Protection by Industrial Category

The average nominal rate of protection in the economy as a whole, weighted by values of output at world prices, was 35 percent. The rates at three-digit levels of industry ranged from −16 percent on vegetable and animal oils and fats (312) to 161 percent on electrical machinery (370). The primary group as a whole (agriculture, mining, and energy) had a nominal rate of protection of −6 percent, while manufacturing as a whole had a nominal rate of 51 percent. This latter figure does not

Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
			Balassa			Corden			
E	D	A	E	D	A	A	E	D	A
-60	-60	-60	-11	-11	-11	-11	-59	-59	-59
-66	-27	-28	-11	33	32	26	-66	-28	-28
-60	-57	-57	-12	-7	-8	-8	-60	-56	-57
-167	17	-34	-25	41	23	16	-154	9	-36
-637	9	29	-446	94	86	69	-631	37	27
-56	-26	-26	16	30	30	25	-42	-28	-28
-95	144	124	-18	144	131	98	-85	137	119
-284	959	923	-106	127	120	90	-260	703	674
-66	-7	-9	-1	49	48	42	-57	-8	-9
58	-429	-427	-100	143	142	110	55	-470	-468
-56	52	49	19	119	116	104	-37	51	48
n.d.	-408	-408	n.d.	206	206	147	n.d.	-424	-424
-127	127	102	-27	110	97	77	-113	118	95
-133	120	96	-31	110	96	77	-119	111	89
-71	-4	-12	-16	54	46	40	-68	-4	-11
-71	-3	-10	-17	55	47	41	-69	-3	-10

change if beverages and tobacco are excluded. The negative nominal protection to agriculture reflects the export taxes on cereals and cattle. These taxes were a recurrent feature of the Argentinian exchange rate and trade taxation system, and allowed the price of foreign exchange to be set above the figure required to make the exports of traditional commodities profitable.

Table 5.1 shows nominal rates of protection for the ten industry groups based on the ISIC used in all the case studies in this volume. The rates reflect the guidelines of the 1967 tariff reform, albeit in attentuated form. Consumer durables showed the high rate intended by the reform (88 percent), but were surpassed by transport equipment (109 percent), and almost matched by machinery (87 percent). The input groups, intermediate products I and II and construction materials, had rates of 51 percent, 67 percent, and 29 percent, respectively. The groups most intensive in Argentine raw materials showed a broad range of rates: processed foods, 2 percent; beverages and tobacco, 50 percent; and nondurable consumer goods, 56 percent. The considerable escalation incorporated into the tariff system in 1967 was thus still noticeable in 1969, but the discrimination in favor of the production of capital goods had been eroded.[8]

Nominal rates of protection varied widely within each of the ten industry groups, as can be seen from Appendix Table 5.1, and also among the trade categories that

Table 5.2. *Argentina: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1969* (percent)

	Nominal Protection			Effective Protection to Value Added			
				Balassa			Corden
	E	D	A	E	D	A	A
Export Industries	-9	-7	-8	-16	-10	-11	-11
Primary Activities	-10	-10	-10	-13	-13	-13	-13
Manufacturing	-9	-5	-2	-31	44	8	7
Export-and-Import-Competing Industries	3	78	69	-42	113	95	77
Primary Activities	0	70	50	-11	74	49	45
Manufacturing	4	78	71	-61	122	104	82
Import-Competing Industries	6	76	74	-74	131	125	97
Primary Activities	n.d.	37	37	n.d.	34	34	31
Manufacturing	6	76	74	-74	133	126	97
Non-Import-Competing Industries	-2	59	57	53	109	103	82
Primary Activities	0	28	28	-6	31	31	25
Manufacturing	-2	61	59	-54	116	110	88
All Industries	-8	41	36	-20	55	47	41
Primary Activities	-10	-6	-6	13	-8	-9	-9
Manufacturing	-7	57	51	-40	112	97	78

are shown in Table 5.2. The range of nominal rates reveals the extent to which relative prices in Argentina's manufacturing sector diverged from international relative prices. It also indicates the need for caution in the use of average rates.

Nominal Protection of Domestic Sales Versus Exports

Significant differences existed in the nominal protection offered exports and domestic sales, as can be seen from Table 5.1 and Appendix Table 5.1.[9] In Argentine industry as a whole, nominal protection was 41 percent for domestic sales and −8 percent for export sales. Some of the difference was due to the greater importance of taxed agricultural products in total exports than in total domestic consumption. Yet within manufacturing, where this factor was absent, the discrimination was equally sharp: 57 percent for domestic sales and −7 percent for export sales. The result for manufacturing is explained in part by the high protection of domestic markets and in part by the fact that, as a proportion of total exports, products subject to export taxes outweighed products receiving export subsidies.

Disaggregation into the ten industry groups does not change the picture (Table 5.1). Only in agriculture, forestry, and fishing was the discrimination small, owing to the influence of exports on domestic prices in this sector. In the remaining industry groups, discrimination against exports and in favor of domestic sales ran from 16 percentage points (processed foods) to 109 percentage points (transport equipment). At the three-digit sector level (Appendix Table 5.1), five sectors had nominal protection on exports slightly in excess of that on domestic sales, and one sector had almost equal export and domestic protection.

Although exports of processed foods on the average received 16 percentage points less protection than domestic sales, at the three-digit level discrimination ran from zero on sales of animal fats and vegetable oils (312) to 18 percentage points on sales of cocoa, chocolate, and candy (208) and 75 percentage points on sales of sugar (207).[10] Three sectors—canning and preserving of fruits

Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
			Balassa			Corden			
E	D	A	E	D	A	A	E	D	A
-66	-58	-60	-14	-9	-10	-10	-64	-57	-59
-60	-60	-60	-11	-11	-11	-11	-59	-59	-59
-125	-1	-60	26	40	8	7	-118	-7	-60
-101	60	41	-32	112	96	77	-103	60	41
-67	8	-14	-10	76	51	47	-66	10	-12
-151	77	55	-44	120	104	82	-137	75	55
-158	150	141	-59	130	124	96	-144	143	134
n.d.	-28	-28	n.d.	32	32	30	n.d.	-27	-27
-158	148	139	-59	131	125	96	-144	141	132
-169	116	107	-40	107	102	81	-147	108	100
-55	-29	-29	-6	31	31	25	-55	-29	-29
-173	156	145	-41	114	109	86	-151	145	135
-71	-3	-10	-17	55	47	46	-69	-3	-10
-60	-57	-57	-12	-7	-8	-8	-59	-56	-57
-133	120	96	-31	110	96	77	-119	112	89

and vegetables (203), canning and preserving of marine products (204), and baking (206)—had a small pro-export bias. In the beverages and tobacco category, exports of tobacco manufactures were taxed at 10 percent, whereas the domestic sales of this group received nominal protection of about 50 percent. Mining and energy had a similar characteristic: the components of this category received zero nominal export protection, whereas the protection of domestic sales ranged from 30 percent to 71 percent.

Construction materials showed a somewhat different pattern. In the case of bricks (331), which have very high transport costs, the discrimination against exports was largely irrelevant. The only sector in which exports were significant was the manufacture of nonmetallic products not elsewhere classified; here exports received 12 percent nominal protection, while the domestic protection of this sector (339) was 28 percent.

Discrimination against exports was evident in the intermediate products I category, except that leather goods not elsewhere classified (299) received almost equal protection on export and domestic sales. Intermediate products II showed some relatively high rates of export protection, but the corresponding rates on domestic sales were even higher. The nondurable consumer goods category also included a number of sectors with higher than average export protection, but in most instances, domestic protection was at least four times as high as export protection.

Discrimination against exports was even more marked in consumer durables, where it reached 150 percentage points for electrical fixtures and equipment (370), and in the machinery and transport equipment categories. Nominal protection rates on domestic sales ranged from 88 to 96 percent for machinery and from 44 to 148 percent for transport equipment.

Tax Incentives

The tax incentive system in 1969 comprised incentives of general and of special incidence. The general incentives allowed reduction of the tax base or tax pay-

ment, keyed principally to expansion in productive capacity or improvement in technology. The special incentives were designed to encourage particular industries or regions, and in time had grown to cover almost all industrial branches (even bread) and many areas of the country; excluded were parts of the provinces of Buenos Aires, Santa Fe, Cordoba, La Pampa, San Luis, and Mendoza. Other special tax provisions applied to exports and have already been discussed.

Under the general incentives, deductions were allowed for industrial investment in machinery and installations as well as agricultural investment in land improvement and increases in the stock of reproductive cattle. Incentives for agriculture further included a deduction (over and above the normal cost items included in calculating profit) for fertilizers, pesticides, weed control, and veterinary products, as well as for 50 percent of the wages and salaries of agricultural technicians.

Agricultural producers were liable for land tax, at an effective rate of slightly more than 1 percent of the assessed value of the land including improvements.[11] Tax payments were regarded as prepayments of agricultural (or land-derived) income tax, although no refund was obtainable if the land tax liability exceeded the income tax liability. For a large majority of landowners and rural taxpayers, however, the land tax came to more than their income tax liability. Twenty-three percent of the land taxpayers of 1969 had not filed any income tax forms in previous years, and they were not necessarily small landowners, since they contributed 15 percent of the total land tax paid in that year. At the other end of the scale, about 15 percent of the individual farmers and 10 percent of the corporations in agriculture paid income tax greater than the land tax.

Firms in any one ISIC five-digit or three-digit sector naturally had different types of tax situations, so that the average tax deduction applicable to a sector would be impossible to calculate from the statutory provisions. Such calculations would also have to allow for differences in tax collection procedures and the severity of audits. Rather, it seemed preferable to calculate the size of the tax subsidies by first constructing estimates of the actual taxes paid by each sector, then taking as benchmark the average tax incidence, and regarding positive or negative deviations therefrom as positive or negative subsidies, as explained in Chapter 1. Further adjustments were made, however, for tax benefits to exporters.

In agriculture, the estimated income tax liability in excess of land tax payments was added to the actual land tax collections to obtain total income tax and land tax revenue from agriculture. We next subtracted the main budgetary subsidy to agriculture, namely the budget of the Agricultural Technology Institute. The resulting figure was taken as the net income tax burden of agriculture.

The income tax liability of industry as a whole was calculated from the total tax liability declared by corporations and limited partnerships for 1969, revised on the basis of the historical relation between declared liability and actual collections. To this total was added the estimated tax liability on nonwage income of unincorporated enterprises.

No indicator of the differences in tax liability between different industrial sectors was available, and hence the total estimated tax bill of the industrial sectors was allocated between them on the basis of estimated cash flow before taxes. This method assumes that all industrial sectors faced a uniform tax liability on their cash flow; on a value added basis, the tax liability thus calculated obviously varies among sectors. That the calculation is subject to error is of little importance since the resulting estimate is equivalent to only 2.2 percent of GNP and 4.0 percent of cash flow in 1968. The difference in tax incidence between agriculture and industry is significant, however, and indicates that agriculture is much less taxed than industry.

Credit Incentives

Argentina in 1969 had a sophisticated financial system consisting of the government (development) banks, the commercial banking system, and the nonbank financial intermediaries. The two principal development banks were the Banco de la Nacion Argentina, which lent principally to the agricultural sector, and the Banco Industrial Argentino (now the Banco Nacional de Desarrollo), which lent principally to industry.

Credit subsidies were given through preferential lending administered either by the two development banks or by the Central Bank through its reserve requirement regulations, which it manipulated to allow the commercial banking system to hold certain kinds of paper, such as pre-export, postexport, or import-substitution finance, at low interest rates.[12] The export-related part of these incentives has already been discussed.

Financial intermediaries other than banks included finance companies, cooperative "banks," major companies, and wealthy individuals, linked by an active group of brokers. The importance of this market fluctuated greatly, depending principally on the tightness of monetary policy.

The credit subsidies received by each two-digit sector were calculated as the difference between the interest charges it actually paid and those that it would have paid at the overall average interest rate paid by all sectors to all sources. The average interest rates paid at the sectoral level were calculated by estimating the division of finan-

Table 5.3. *Argentina: Sources of Credit and Interest Rates Paid, by Two-digit Industry Group, 1969*
(percent)

ISIC	Sector	Bank Credit		Extra-Bank Credit	Average Annual Rate Paid
		Subsidized	Commercial		
01	Agriculture	53.4	46.7	-	15.3
	Mining	6.7	93.3	-	18.5
20	Processed Foods	10.3	57.4	32.3	19.9
21	Beverages	1.5	72.4	26.1	20.0
22	Tobacco	3.6	73.9	22.5	19.9
23	Textiles	3.9	67.0	29.1	20.1
24	Shoes & Apparel	.6	70.3	29.1	20.4
25	Wood & Wood Products	2.2	50.3	47.5	21.2
26	Furniture	.6	51.9	47.5	21.3
27	Pulp & Paper	2.3	50.4	47.3	21.3
28	Printing, Publishing	2.2	39.2	58.6	21.8
29	Leather	27.3	44.4	28.3	18.5
30	Rubber	.6	58.6	40.8	21.0
31	Chemical Products	3.6	69.7	26.7	20.0
32	Petroleum & Coal Products	.1	16.0	83.9	23.1
33	Nonmetallic Minerals	.6	41.0	58.4	21.9
34	Basic Metals	3.8	71.5	24.7	19.8
35	Metal Products	1.1	74.2	24.7	20.1
36	Nonelectrical Machinery	12.7	51.4	35.9	19.2
37	Electrical Machinery	.6	60.3	39.1	20.9
38	Transport Equipment	1.5	62.6	35.9	20.5
39	Miscellaneous Manufactures	1.3	39.1	59.6	21.9
	Average				19.11

Sources: Banco Central de la Republica Argentina, Boletin Estadistico Memoria (various issues), and Fundacion de Investigaciones Economicas Latinoamericanas (FIEL), "Los Flujos Financieros en el Sector Industrial, Mediante Analisis de Fuentes y Usos de Fondos" (Buenos Aires, 1970).

cial liabilities between the banking system and the nonbank financial intermediaries on the basis of sample data.[13] Liabilities to banks were further broken down between subsidized and normal lines of credit, on the basis of information on the volume of credit outstanding from the banking system as a whole and from the subsidized lenders—Banco de la Nacion, Banco Industrial Argentino, and the Central Bank through its management of export promotion credit.

Information on credit outstanding from the banking system on December 31, 1969, was available at the two-digit sectoral level. From the sectoral totals we subtracted our estimates of subsidized loans outstanding to obtain the loan portfolio of banks at commercial banks. Interest rates on each category of credit were estimated from a variety of sources. Export credit was taken at its statutory rates of 6 percent for Circular 344/689 and 12 percent for Circular 502, although the effective rates were probably lower; Banco de la Nacion loans to agriculture were found to cost 12 percent on the basis of an analysis of 167 lines of credit open and in use in 1969; for the Banco Nacional de Desarrollo information was available on loans made and rates charged, by sector; the rate paid ranged from 8 percent to 13 percent, averaging 12 percent for all sectors. In turn, for commercial bank credit, commissions and compensating balance raised the nominal rate to 14 percent; on the basis of a survey by the Fundacion de Investigaciones Economicas Latinoamericanos (FIEL) undertaken at the end of 1968, the prime cost of funds in the extra-bank market was estimated at 24 percent.

Table 5.3 shows sources of financing by sector as well as the average rates estimated to have been paid. It is immediately obvious that the structure of the credit

market benefited agriculture at the expense of industry, and that mining was in general unaffected. Similarly, it is clear that within industry, differences in interest rates were of little importance.

Effective Incentives, 1969

Our estimates of effective incentives in Argentina in 1969 reflect the composite effects of the trade regime, tax structure, and credit incentives on value added at world prices or cash flow after taxes at world prices. We have calculated the effects of these measures on all sales together and on sales in the domestic market and for export separately. A comparison of the latter two measures permits us to draw inferences about the extent of anti-export bias in the system. Estimates of effective protection were originally made at the five-digit level of disaggregation. But since we considered the tax and credit data too unreliable to disaggregate further than the three-digit level, estimates of effective subsidies were made only at that level.

The results are presented at the three-digit level (77 sectors) and aggregated to the ten industry groups and the four trade categories. It should be added that aggregating incentive rates calculated at the three-digit level introduces a certain element of error into the results, since many three-digit sectors include commodities that belong to different industrial and trade categories.

The input-output coefficients used apply to 257 five-digit sectors and are based mainly on the economic census of 1963, with prices updated to 1969. Trade and production data were linked at the level of the 6,000 BTN positions and the 13,000 items that represent the breakdown of input-output categories.[14]

We have calculated two kinds of measures of effective incentives: those taking value added as a base and those taking cash flow as a base. The first group, rates of effective protection and effective subsidy to value added, are indicators of the extent to which factor payments as a whole have been affected by the incentive system. Effective rates of protection and subsidy to cash flow are measures of the extent to which profitability has been affected by the incentive system. To calculate them, we have assumed that real wages remain constant—this assumption appears to approximate the way in which wage agreements in the major industries have dealt with price changes. In other words, we have assumed that when tariffs raise the prices of products consumed by labor, the nominal wage rises in an offsetting fashion and the price increases are passed through. Deducting the cost of labor from value added makes cash flow the residual income share, and hence the beneficiary of incentives and disincentives.

Tables 5.1 and 5.2 show calculations of effective incentives in the ten industry and four trade categories, respectively. These results have been adjusted for the overvaluation of the exchange rate relative to the hypothetical free-trade situation. Because the high protection in Argentina had such a large effect on the exchange rate, our discussion of the structure of incentives uses the net incentive rates obtained after adjustment for the extent of overvaluation. These rates were calculated by the Balassa formula and are shown, together with Corden rates for total sales, in Tables 5.4 and 5.5.

Adjustment for the Overvaluation of the Exchange Rate

Estimating the overvaluation of Argentina's exchange rate in 1969 poses special conceptual problems, arising from the fact that the country's main export products were also wage goods. A switch to free trade would have caused substantial readjustments in relative prices, in particular by raising food prices. Income would have been redistributed from the city to the countryside, but also away from workers. In the post–World War II period, such a policy has never succeeded. Rather, the consequences of efforts to readjust relative prices have been inflation, recession, and attempts by all groups to maintain their income shares.

The elasticity formulas conventionally used to calculate free-trade exchange rates (including the one used throughout this volume) do not explicitly account for the willingness of income recipients to accept reductions in, or redistributions of, real incomes; nor do they incorporate the fluctuations in aggregate real income arising from changes in the level of activity in the economy that may result from such reactions to a deduction. At the same time, if no one accepts a reduction in real income, devaluation alone may not eliminate a balance of payments deficit.

Ideally, therefore, the calculation of a free-trade exchange rate for Argentina would require taking into account changes in aggregate demand, as well as the reactions of various sectors to changes in absolute and relative prices (and hence in absolute and relative incomes). Alternatively, a set of complementary fiscal measures would have to be specified together with a free-trade policy. Such an effort would, however, go far beyond the confines of this essay. We have therefore calculated a conventional free-trade equilibrium exchange rate for Argentina on the basis of the methodology described in Chapter 1, but add the caveats: this is a benchmark figure for the purposes of international comparisons of protection levels; we do not imply a proposal to change to free trade and implement such a rate; and the econometric data underlying the parameters are

rather weak. The derivation of these parameters will be described in what follows.

The price elasticity of the foreign demand for Argentina's traditional exports differed significantly among major markets. In most products, the United Kingdom and the original six members of the European Economic Community bought more than half of Argentine exports. Price elasticities of demand were low in the EEC because of the variable duties it imposed, and in the United Kingdom, because of Argentina's relative importance as beef supplier in that market. Only in other foreign markets, including the United States, could one expect the price elasticity to be high. Estimates of the price elasticity of demand for chilled Argentine beef in the United Kingdom range from -1.9 to -2.4.[15] Considering that elasticities for the other products and markets are likely to have been higher and also bearing in mind the EEC's variable duties, we have taken the composite foreign demand elasticity for Argentinian traditional exports to be -3.0.

The price elasticity of supply of traditional exports has been estimated to be 0.3 and the domestic demand elasticity for these products to be -0.3.[16] Since 29 percent of the output was exported, these figures imply a supply elasticity of 1.8 for traditional exports. The resulting elasticity of the supply of foreign exchange earned by traditional exports is 0.75.

In its nontraditional exports, Argentina is a marginal supplier and the foreign demand elasticity should therefore be high. Eaton has estimated the elasticity of supply of foreign exchange from nontraditional exports on the assumption that foreign demand is infinitely elastic.[17] The resulting upward bias may be offset by the downward bias introduced by the annual time frame of his estimates, as well as by his use of a time trend that may well have picked up much of the cumulative effect of exchange rate changes. Although on balance his estimate of 2.0 is probably lower than the long-run elasticity, it has been adopted here.

Estimating the price elasticity of demand for imports in Argentina presents a variety of econometric problems. Existing estimates are not significantly different from zero. The range of observation has been so restricted, however, that a downward bias is to be expected. Furthermore, since a decline in income invariably coincided with substantial rises in the relative prices of imports, the relevance of these estimates for our purposes becomes even more questionable. Were Argentina to pursue free trade, there is no doubt that its imports would rise substantially at first, and that some domestic output would disappear altogether. At the same time, some increase in productivity owing to competition as well as to specialization could be expected. Taking account of these considerations, we assign the demand for imports an elasticity of 2.6. Combining the assumed elasticity values with average nominal rates of protection and actual imports in 1969, we have estimated the extent of overvaluation for that year to be 40 percent.

Net Effective Protection and Subsidy to Value Added

The average net effective protection (to value added) in the Argentine economy as a whole was 1 percent, which hides a very large difference between the average rate for manufacturing, which was 32 percent, and the average rate for primary production, which was -35 percent (Table 5.4). This situation reflects the dual exchange rates traditionally employed by Argentina: a lower one for primary production and a much higher one for manufacturing. A further distinction can be drawn between agriculture and other primary production, principally mining. The former had negative effective protection of -38 percent, whereas mining and energy had negative protection of -12 percent.

On an effective subsidy basis, the overall average is unchanged, while the components differ slightly. Manufacturing now has one percentage point less positive protection, and primary production has slightly under one percentage point less negative protection. The difference arises from the domestic tax and credit measures, which benefited agriculture.

It is obvious from these results that Argentine policy transferred income from agriculture to the other sectors of the economy. The results also confirm the common impression that this transfer was achieved through trade policy, since the domestic tax and subsidy measures did not offset it to any significant degree. The system of incentives strongly discriminated against the agricultural sector, presumably in order to affect the income distribution from economic activity; in the process, productive efficiency was compromised. Ways of achieving the same distributive goals without incurring the cost of inefficiencies are discussed in the section "Policy Recommendations."

Grouping the net rates by trade orientation also yields results in accordance with expectations (Table 5.5). Import-competing sectors had the highest effective rates of protection with a subsidy to value added of 48 percent; next in order were non-import-competing goods (36 percent), export-and-import-competing (XIC) goods (31 percent), and finally export goods (-37 percent). This pattern appears to be related to the process of import substitution in the course of which certain tariffs became redundant. Sectors in which part of domestic supply was still imported in 1969 received high protection to encourage further import substitution, but the relevant

Table 5.4. *Argentina: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added			
				Balassa			Corden
	E	D	A	E	D	A	A
Agriculture, Forestry, & Fishing (I)	-36	-36	-36	-38	-38	-38	-38
Mining and Energy (IV)	-27	-7	-8	-39	-11	-12	-10
Primary Activities (I & IV)	-36	-33	-33	-38	-35	-35	-35
Processed Foods (II)	-35	-24	-27	-54	-3	-17	-15
Beverages & Tobacco (III)	-36	8	7	-332	30	25	22
Construction Materials (V)	-20	-8	-8	-30	-11	-11	-10
Intermediate Goods I (VIA)	-34	11	8	-51	60	51	42
Intermediate Goods II (VIB)	-29	21	20	-112	49	45	37
Nondurable Consumer Goods (VII)	-20	13	12	-38	3	2	2
Consumer Durables (VIII)	-20	35	35	-108	62	61	51
Machinery (IX)	-18	36	34	-33	53	50	46
Transport Equipment (X)	n.d.	49	49	n.d.	97	97	77
Manufacturing, less Beverages & Tobacco (II, V-X)	-33	13	8	-57	42	32	27
Manufacturing (II, III, V-X)	-33	12	8	-60	41	32	27
All Industries, less Beverages & and Tobacco (I, II, IV-X)	-34	0	-4	-43	6	0	0
All Industries (I-X)	-34	1	-3	-44	7	1	1

tariffs had to be very high to be effective in this regard. Sectors in which substitution had already taken place were presumably those in which domestic production costs were lower, and which had had time for tariffs to become redundant. The mixed group was in the middle, and exports were taxed.

Disaggregating between primary and manufacturing production shows that the range of effective protection rates on the four trade categories was generally narrower for primary goods than for manufacturing. The extent of export taxation stands out dramatically; furthermore, exports of manufactures were taxed at much higher rates than those of primary goods.[18] The results change little if effective subsidy rates rather than effective protection rates are considered.

The rates for the ten industry groups shown in Table

Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
			Balassa			Corden			
E	D	A	E	D	A	A	E	D	A
-61	-61	-61	-37	-37	-37	-37	-61	-60	-60
-69	-35	-36	-38	-12	-12	-10	-69	-35	-36
-61	-59	-59	-37	-34	-35	-34	-61	-58	-58
-143	-23	-56	-51	-5	-18	-18	-143	-29	-58
-523	13	6	-330	29	24	21	-519	12	5
-63	-37	-37	-22	-12	-12	-11	-52	-38	-38
-96	68	55	-45	59	50	41	-88	53	42
-219	149	138	-104	48	43	36	-205	92	83
-70	-21	-22	-31	2	1	1	-62	-23	-24
156	2,109	2,102	-100	60	60	50	-399	214	215
-59	37	34	-17	52	49	46	-43	35	33
n.d.	-2,680	-2,680	n.d.	96	96	77	n.d.	2,361	2,361
-120	54	37	-52	40	31	26	-110	41	26
-124	52	35	-54	40	31	26	-114	39	25
-72	-18	-24	-41	6	0	0	-70	-20	-26
-74	-17	-23	-42	6	1	1	-71	-19	-25

5.4 provide some evidence that protection escalated. Nondurable consumer goods had a higher net effective rate of protection than processed foods (2 percent versus −17 percent). Consumer durables had a higher rate than intermediate goods I and II or machinery (61 percent versus 51 percent, 45 percent, and 50 percent), and mining and construction materials (−12 percent and −11 percent) had lower rates than all groups other than processed foods. Neither the values nor the ordering of industry groups change noticeably when we move from effective protection to effective subsidy.

Net Effective Protection by Industry Group

The composition of net effective rates within the ten industry categories is of further interest. Since the levels

Table 5.5. *Argentina: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Export Industries	-35	-34	-34	-41	-36	-37	-36	-68	-59	-62	-39	-35	-36	-36	-67	-59	-61
Primary Activities	-36	-36	-36	-38	-38	-38	-38	-61	-61	-61	-37	-37	-37	-37	-61	-61	-61
Manufacturing	-35	-25	-30	-55	-4	-28	-24	-119	-25	-70	-51	-7	-28	-24	-114	-30	-70
Export-and-Import-Competing Industries	-27	27	21	-61	43	31	27	-109	30	15	-54	42	31	27	-102	30	15
Primary Activities	-29	22	7	-38	21	4	4	-69	1	-20	-37	23	5	5	-69	3	-18
Manufacturing	-26	27	22	-74	47	36	30	-137	39	22	-64	46	36	30	-127	38	22
Import-Competing Industries	-24	26	24	-83	52	48	41	-143	68	61	-73	51	48	40	-132	60	55
Primary Activities	n.d.	-2	-2	n.d.	-7	-7	-6	n.d.	4	4	n.d.	-8	-8	-7	n.d.	10	10
Manufacturing	-24	26	24	-83	53	49	41	-143	67	61	-73	52	48	40	-132	60	54
Non-Import-Competing Industries	-30	14	12	-69	39	36	30	-147	48	42	-61	38	35	29	-131	35	29
Primary Activities	-29	-8	-9	-38	-13	-13	-11	-60	-36	-36	-38	-13	-13	-11	-60	-36	-36
Manufacturing	-30	15	13	-70	44	40	34	-149	65	58	-61	43	39	33	-133	47	41
All Industries	-34	1	-3	-44	7	1	1	-73	-17	-23	-42	6	1	1	-71	-19	-25
Primary Activities	-36	-33	-33	-38	-35	-35	-35	-61	-59	-59	-37	34	-35	-34	-61	-58	-58
Manufacturing	-33	12	8	-60	41	32	27	-124	52	35	-54	40	31	26	-114	39	2

and structure of both indicators were similar and the effective subsidy measure is more comprehensive, we cite only the values of the latter.

In the case of agriculture, forestry, and fishing, no disaggregation is available at the three-digit level. Processed foods as a whole had a net effective subsidy rate of −18 percent (Table 5.4). Two of its ten three-digit sectors were subsidized: sugar (207) at a rate of −205 percent, indicating that value added was negative at world prices, and food industries not elsewhere classified (209) at 8 percent.

For beverages and tobacco, the average net effective subsidy rate was 24 percent, but rates on alcoholic beverages varied widely. Within the mining and energy category—which had an average net effective subsidy of −12 percent—stone, clay, and sand quarrying (193) had a rate of −42 percent and salt mining (191) a rate of −50 percent; the positive rates ranged up to 11 percent for raw materials used in fertilizer and chemical products (192). In turn, the net effective subsidies of −30 percent on cement (334) and 23 percent on clay products (333) were largely responsible for the −12 percent average for construction materials.

The net effective subsidy on intermediate products I was 50 percent, with much variance. The extreme case is sector 329—various derivatives of petroleum and coal—which had negative value added and world market prices and a net effective subsidy rate of −249 percent. Next in line comes woodworking (251), which received an effective subsidy of 492 percent, followed by spinning, weaving, and finishing of textiles (231) at 388 percent. The low rates in the intermediate products I category applied to leather goods other than clothing (292), and tanneries (291), both of which had net effective subsidy rates of −32 percent, and other leather goods (299), which had a rate of −28 percent. Rates were more uniform in the intermediate products II category, which had an average net effective subsidy rate of 43 percent. Ten of the seventeen rates were above 50 percent, and one sector (rubber products not elsewhere classified, 309) had negative value added in world market prices.

Nondurable consumer goods, which is a much less homogeneous category, had an average net rate of 1 percent; sectoral rates ranged from −566 percent on jewelry (398) to 171 percent on manufacturing not elsewhere classified (399) and −31 percent on printing and publishing (280). Durable consumer goods is another category in which the average, 60 percent, conceals considerable differences among sectors. The lowest rate, −4 percent, pertained to furniture and accessories (260); the highest rates in this category were 56 percent, 160 percent, and 241 percent for watchmaking (393), motorcycles (385), and electrical appliances (370), respectively.

The average effective subsidy rate of 49 percent for machinery reflects a range from 42 to 95 percent and is heavily influenced by that of the sector having the lowest rate—nonelectrical machinery (360). Sectors producing transport equipment received from 41 percent to 155 percent effective net subsidies, except for the construction of airplanes (386), which had a net effective rate of subsidy of only 1 percent. The average net effective subsidy for transport equipment was 96 percent.

Net Incentives to Cash Flow

The average net effective rate of protection on cash flow in the economy as a whole was −23 percent, and the average net rate of effective subsidy on cash flow was −25 percent (Table 5.4). These values imply that on an aggregate basis, the incentive system reduced profits. The situation differed greatly, however, between primary production and manufacturing. In the former, the effective subsidy to cash flow was −58 percent, whereas for manufacturing the effective subsidy to cash flow was 25 percent. Thus it appears that income was transferred out of profits in primary production into profits in industry.[19] Among the ten industry categories in Table 5.4, half had negative net effective rates of subsidy.

The negative incentive to cash flow in agriculture (−60 percent) accords with the deliberate taxation of agriculture through protection. A negative rate is shown also for mining and energy (−36 percent). Net effective subsidies to cash flow show a pattern of escalation analogous to that of the effective rates on value added. The progression goes from agriculture (−60 percent) to processed foods (−58 percent), and construction materials have effective rates (−38 percent) similar to those of mining and energy (−36 percent). It continues from intermediate goods I (42 percent) to intermediate goods II (83 percent), to durable consumer goods (215 percent), and to transport equipment (2,361 percent). Machinery, at 33 percent, also fits the pattern since it is an input for other industries. Nondurable consumer goods (−24 percent), however, show reverse escalation.

Net Incentives to Domestic Sales

Among the ten industry groups, the structure of the incentives to value added for domestic sales is not much different from the average, but the level is generally higher. The same general observation holds for the cash flow measures.

The average of domestic net effective protection for the entire economy, at 7 percent, was 6 percentage points above the average for both markets (Table 5.4). For manufacturing, the spread was slightly wider (41 percent compared with 32 percent), while for primary

Table 5.6. *Argentina: Export Incentives Related to the Value of Manufactured Exports, 1969*

		Value of Exports ('000 US$)	Gross Nominal Protection	Income Tax Benefit	Interest Subsidy	Total
			(percentages)			
20	Processed Foods	2,309.6	-8.9	0.2	0.4	-8.3
22	Tobacco	20.5	-10.0	-	0.3	-9.7
23	Textiles	131.0	-4.5	2.7	1.7	-0.1
24	Shoes & Apparel	10.4	12.0	6.8	0.4	19.2
28	Printing, Publishing	61.5	12.0	6.8	0.3	19.1
29	Leather Goods	351.7	-11.1	1.3	0.4	-9.4
31	Chemical Products	250.6	-6.4	2.0	0.5	-3.9
33	Nonmetallic Minerals, excl. Petrochemicals & Coal	1.3	12.0	6.8	-	18.8
34	Basic Metals	49.1	23.2	6.2	2.9	32.3
35	Metal Products	4.9	14.0	6.8	0.2	21.0
36	Nonelectrical Machinery	95.8	14.8	6.8	7.3	28.9
37	Electrical Machinery	7.9	12.0	6.8	0.3	19.1
38	Transport Equipment	20.5	12.0	6.8	2.5	21.3
39	Miscellaneous Manufactures	21.1	10.8	4.4	0.4	15.6

production the difference was less than one percentage point. The net effective subsidy on value added shows a similar pattern. Finally, the average net effective protection to cash flow was −17 percent on domestic sales, compared with −23 percent on all sales. Domestic sales of manufactured goods received net effective protection on cash flow of 52 percent, compared with 35 percent for all sales. These differentials show a similar pattern for effective subsidies.

Net Incentives to Exports

The contribution of each of the three incentive systems to the total incentives for manufactured exports can be seen in Table 5.6. In general, it appears that two thirds of the export incentives came from nominal protection and another third from the income tax deduction. Except for four sectors, the interest subsidy was negligible.

It must be borne in mind that the data have been expressed as a proportion of export value and that the averages for each sector have been calculated on the basis of export weights. Thus, they include an upward bias to the extent that higher incentives lead to more exports, and a downward bias to the extent that Argentina's exports were dominated by lightly processed raw materials that received few incentives. The exports of five out of fourteen industry groups were on balance taxed at the existing prices. Within these groups, the exports of some

sectors were subsidized, but the value of the exports of the subsidized sectors was not large enough to compensate for the weight of the taxed sectors. The zero average incentive for textiles (group 23), for example, was influenced by the 5 percent export tax levied on washed wool (sector 23102), which contributed many of the exports of the group. In chemicals (group 31), tanning acids and other tanning agents (sector 31106) were subject to a 13 percent export tax, and inedible animal fats (sector 31201) to a 16 percent export tax. The incentives for these two items, which accounted for 60 percent of the exports of chemicals, more than outweighed the export incentives given to other chemical products, which ranged up to 19 percent.

Among industry groups that received positive export incentives, basic metals (group 34) had the highest, with a rate of 32.3 percent, which reflects the large duty drawbacks on iron and steel. Seven groups received export incentives ranging from 15 to 39 percent.

Table 5.6 also shows the value of exports for each industry group; there seems to be an inverse correlation between export incentives and export value. Thus, processed foods, which dominated the export list despite an export incentive of −8 percent, was followed by leather goods with an export incentive of −9 percent, while basic metals, which had the highest export incentive, had only a fraction of the exports of these other sectors. To understand this situation more fully it is necessary to analyze the rates of effective protection and subsidy to exports, for which the rates shown in Table 5.6 are but a poor proxy.

NET EFFECTIVE PROTECTION AND SUBSIDY TO VALUE ADDED IN EXPORTS. In 1969, the overall net effective protection on export was −44 percent (Table 5.4). The net rate on manufactured exports was −60 percent, and that on realized primary exports was −38 percent. In three of the ten categories—beverages and tobacco, intermediate products II, and durable consumer goods—world market value added in exports was negative. The most heavily taxed category was processed foods (−54 percent), followed by intermediate products I (−51 percent). Construction materials had the lowest tax on exports (−30 percent); no category had a positive rate. (The rate for transport equipment is not defined, since no transport equipment was exported in that year.)

At the three-digit level, only 5 out of 77 sectors received positive net export protection, and of these, one had negative value added at world market prices. In general, export taxation rarely amounted to less than −25 percent. Twelve of the three-digit sectors had negative value added in exports at world market prices. These sectors were widely dispersed among the ten industry groups.

As one would expect, the net effective subsidies to exports were somewhat more favorable than the net effective rates of protection (Table 5.4). Overall, the net effective subsidy to exports was −42 percent; for manufacturing alone it was −54 percent. For only a few sectors, however, does the inclusion of a subsidy make a major difference: for example, the incentives for exports increase from −29 percent to −21 percent in the case of basic iron and steel (341), and from −34 percent to −24 percent for metal products except machinery and transport equipment (350) as well as for nonelectrical machinery not elsewhere classified (379). The general impression that emerges is one of great variation in export rates, with taxation predominating. The implications of this bias against exports will be taken up next.

NET SUBSIDIES TO CASH FLOW IN EXPORT PRODUCTION. Export incentives also appear to have been strongly negative from the measures based on the cash flow (Table 5.4). Among the ten industry groups, exports of consumer durables alone show positive net effective protection to cash flow, but this result can be traced to the concurrence of a negative numerator and denominator in one of the constituent three-digit sectors. At the three-digit level, very few sectors have positive indicators.

Negative cash flow may be the result as much of losses under protection as of potential losses under free trade. By decomposing indicators to determine the source of the negativity, we found that 33 out of the 77 three-digit sectors had negative cash flow in exports under protection. Of these, 16 had negative cash flow under free-trade conditions.

THE ANTI-EXPORT BIAS. The relative anti-export bias is an indicator of whether the incentive system makes it more attractive for the producer to sell on the domestic market or on the export market. Table 5.7 shows that, on a value added basis, 70 out of 82 sectors had an effective subsidy to export sales lower than the corresponding incentive to domestic sales. These sectors were widely distributed throughout the ten industry groups.

A comparison of the effective subsidies to cash flow on export and domestic sales reveals a relative anti-export bias in 61 sectors. The decreases are concentrated in intermediate products and in highly processed goods, such as consumer durables, machinery, and transport equipment.

An alternative procedure is to consider the absolute value of incentives given to exports. An absolute anti-export bias may be said to exist if net effective rates on exports are negative. On this basis, an absolute anti-export bias is shown for almost all the three-digit sectors on the basis of value added, and for 67 out of 82 sectors on the basis of cash flow.

Table 5.7. *Argentina: Relative and Absolute Bias against Exports, by Industry Group, 1969*
(number of three-digit sectors)

	Total Number of Sectors	Sectors with Relative Anti-export Bias		Sectors with Absolute Anti-export Bias	
		Value Added	Cash Flow	Value Added	Cash Flow
Primary Activities (I)	1	0	0	1	1
Processed Foods (II)	10	7	7	9	9
Beverages and Tobacco (III)	5	5	5	4	4
Mining and Energy (IV)	8	6	6	8	7
Construction Materials (V)	3	2	2	3	3
Intermediate Products I (VIA)	11	9	7	10	9
Intermediate Products II (VIB)	17	16	15	17	14
Nondurable Consumer Goods (VII)	14	12	11	14	12
Consumer Durables (VIII)	4	4	2	4	2
Machinery (IX)	3	3	2	3	2
Transport Equipment (X)	6	6	4	6	4
All Industries	82[a/]	70	61	79	67

a/ Total includes five three-digit sectors split between different industry groups.

Relations among Indicators of Incentives

Table 5.8 shows Spearman rank correlation coefficients between the average values of different incentive measures for domestic and export sales combined. The various indicators of "gross" incentives, calculated at the existing exchange rate, show, first, that nominal protection has a fairly high correlation with the indicators of incentives to value added, but less correlation with the incentive measures based on cash flow.[20] Second, the correlation among the various incentive measures based on value added is very high. Neither the manner of handling nontraded goods nor the inclusion or exclusion of the domestic incentives introduces significant change in the rank ordering. Third, the incentives to cash flow are only moderately correlated with the incentives to value added; and fourth, effective protection to cash flow and effective subsidy to cash flow are highly correlated with each other.

The same general relations are evident among net incentive measures, except that nominal protection, the value added measures, and effective protection to cash flow are more strongly correlated. In contrast, when measured on a net basis, the effective subsidy to cash flow is less highly correlated with the other measures; in particular, the correlation between effective protection to cash flow and effective subsidy to cash flow is reduced from 0.96 on a gross basis to 0.53 on a net basis.

The difference in the correlations observed within the gross and net groups is explained in part by the correlation between individual gross and net indicators, which is also shown in Table 5.8. The rankings of nominal rates of protection and of effective rates calculated by the Corden measure are the same in the two cases, since adjustment for overvaluation represents an equiproportional change, as emphasized in Chapter 1. This is not the case for the Balassa measure. Nevertheless, the Spearman rank correlation coefficient is 0.995 (rounded to 0.99 in Table 5.8) in the latter case. Gross and net cash flow measures are much less correlated with each other, the least correlated being gross and net effective subsidy to cash flow, which shows a value of only 0.44.

As an alternative to rank correlation, the relation between nominal and effective rates of protection was examined by regressing the latter on the former. The estimated equation is:[21]

$$Z^B = -21.97 + 2.17T \qquad R^2 = 0.755$$
$$\qquad\qquad (14.8) \qquad 73 \text{ observations}$$

where Z^B is the effective rate of protection on value added, measured by the Balassa method, and T is the nominal rate of protection; t values are shown in parentheses.

As can be seen, nominal rates explain 76 percent of the variance of effective rates of three-digit sectors that had positive value added at world market prices. Furthermore, the positive slope for the nominal rates indicates that they escalated less sharply than effective rates. The negative intercept indicates that input protection on occasion outweighed output protection, so that effective rates were negative even when nominal rates on output were positive.

It is interesting to compare this result with that cited by Cohen for Argentina in 1953 and for twenty-three other cases.[22] Cohen's equation for Argentina is:

$$U = -15.01 + 1.15T \qquad R^2 = 0.780$$
$$\qquad\qquad (9.72) \qquad 29 \text{ observations}$$

where U equals the effective rate of protection divided by itself plus 1.

For comparability with Cohen's results, we have reestimated our equation in the U form:

$$U^B = -1.10 + 0.70T \qquad R^2 = 0.785.$$
$$\qquad\qquad (16.2) \qquad 73 \text{ observations}$$

The explanatory power of the regressions is very similar, despite differences in years of observation, degrees of aggregation, and methodology in developing the underlying data. Nonetheless, the differences in the regression coefficients indicate a change in the structure of the productive and protective systems. It follows that using the 1953 equation to predict 1969 effective rates from 1969 nominal rates would have given rise to error.[23]

The regression results can be understood more readily if we decompose the net rate of effective protection into the contributions made to its value by the protection on output, the protection on inputs, and the value added coefficient (that is, the share of value added in output value, both expressed at world market prices).[24] Protection on output clearly contributed more to the effective protection rates than did protection on inputs and thus was largely responsible for the high correlation between nominal and effective protection.

The size of the value added coefficient is of further importance because it measures the net foreign exchange savings (or earnings) on a dollar's worth of output.[25] Industry groups that had value added coefficients greater than 0.5 were agriculture, forestry, and fishing; mining and energy; construction materials; nondurable consumer goods; and machinery. The first three groups are natural resource–based economic activities, the last one is skill based, while the category of nondurable consumer goods includes a number of sectors that are intensive in both natural resources and skills. It would thus appear that the sectors intensive in the factors abundant in Argentina had high net foreign exchange savings coefficients. Many skill-intensive activities, however,

Table 5.8. *Argentina: Spearman Rank Order Correlations between Different Incentive Measures, 1969*

	Nominal Protection	Effective Protection			Effective Subsidy			Net Nominal Protection	Net Effective Protection			Net Effective Subsidy		
		To Value Added		To Cash Flow	To Value Added		To Cash Flow		To Value Added		To Cash Flow	To Value Added		To Cash Flow
		Balassa	Corden		Balassa	Corden			Balassa	Corden		Balassa	Corden	
Nominal Protection	1													
Effective Protection														
To Value Added - Balassa	.84	1												
- Corden	.86	.99	1											
To Cash Flow	.61	.60	.63	1										
Effective Subsidy														
To Value Added - Balassa	.84	1.00	.99	.60	1									
- Corden	.86	.99	1.00	.63	.99	1								
To Cash Flow	.67	.66	.69	.96	.66	.99								
Net Nominal Protection	1.00	.84	.86	.62	.84	.86	.67	1						
Net Effective Protection														
To Value Added - Balassa	.86	.99	1.00	.62	.99	1.00	.68	.86	1					
- Corden	.86	.99	1.00	.63	.99	1.00	.69	.86	1.00	1				
To Cash Flow	.66	.69	.68	.62	.69	.69	.66	.66	.69	.68	1			
Net Effective Subsidy														
To Value Added - Balassa	.86	.99	1.00	.62	.99	1.00	.68	.86	1.00	1.00	.69	1		
- Corden	.86	.99	1.00	.63	.99	1.00	.69	.86	1.00	1.00	.69	1.00		
To Cash Flow	.42	.49	.46	.39	.49	.47	.44	.42	.48	.46	.53	.48	.47	1

are found among the intermediate goods industries, which had much lower net foreign exchange savings coefficients. At the same time, it should be emphasized that comparative advantage depends on the domestic resource cost as well as on net foreign exchange savings (or earnings), and hence examination of the value added coefficient by itself is not sufficient for an analysis of comparative advantage.

The Implicit Exchange Rate System

The protection indicators discussed thus far refer to the net effect on value added or cash flow of various incentive measures, adjusted for the extent of overvaluation of the exchange rate. An alternative way of examining the system of incentives is to recognize that nominal rates of protection generate commodity exchange rates that measure the number of units of local currency corresponding to a unit of foreign exchange embodied in a particular commodity. In symbols:

$$R_i = R(1 + t_i)$$
$$R_i = R(1 + s_i)$$

where R_i is the commodity exchange rate corresponding to good i, R is the official or financial exchange rate, and t_i, s_i are the applicable nominal rates of protection for imports and exports.

The incentive effect of the exchange rate system may now be evaluated by calculating a "cost exchange rate" for each sector and comparing it with the "commodity exchange rate" for the same sectors. The cost exchange rate is defined as the weighted average of the multiple rates affecting a sector's inputs, the weights being the input coefficients taken at world prices.[26]

Table 5.9 shows the cost exchange rates for the three-digit breakdown of the manufacturing sector. For each sector, material inputs are assigned an exchange rate equal to the financial rate times 1 plus the corresponding nominal rate of protection; the wage bill is assigned an exchange rate equal to the financial rate times 1 plus the average nominal protection on the consumption basket of wage earners; and profits are assigned a rate equal to the financial rate times 1 plus the nominal protection on capital goods. Table 5.9 also shows the corresponding export exchange rate for each sector, which is equal to the financial rate times 1 plus the nominal export subsidization (export subsidy and attendant tax benefits), and the respective exchange rate for domestic sales, which is equal to the financial rate times 1 plus the nominal rate of protection on domestic sales.

Examination of the cost exchange rates shows that the implicit taxation incorporated in costs of production was considerable, ranging up to 81 percent of the financial exchange rate (244). Taxation in excess of 40 percent was common. Although overall the export exchange rate was higher than the financial rate, a comparison of the two columns shows that in only four cases was the export rate higher than the cost rate, and that in only a few cases did it come close to it. Therefore the export incentive scheme on the whole did not compensate for the implicit tax levied on producers through higher input costs. For domestic sales, however, the picture is different. In forty-five cases the commodity exchange rate was above the cost rate; in the remaining twenty-three it was below it, but often by very little. Domestic sellers were thus generally more than compensated for the taxation on their inputs.

Incentives and Economic Performance

The underlying reason for analyzing an incentive system is to assess its consequences for economic performance. In the previous sections we described the characteristics and structure of the Argentine system of incentives as it existed in 1969; in this section we attempt to evaluate its overall effects on the economy, concentrating on these central features of the economic history of Argentina since World War II: the pattern of growth, export performance, and the use and allocation of the factors of production.

Incentives, the Pattern of Growth, and Export Performance

In a determined pursuit of import substitution during most of its years of existence, including 1969, Argentina's incentive system systematically favored production for the domestic market and discouraged industrial production for export.[27] This approach led to a vicious circle of growth and stagnation.[28]

In 1969 the incentives for more than 80 percent of the three-digit sectors had an absolute anti-export bias, whereby exports were taxed relative to the free-trade situation. Incentives for more than 60 percent of the sectors had a relative anti-export bias, whereby domestic sales were more remunerative than export sales. The result of the bias in incentives was the rapid growth of an industrial sector that generated far less foreign exchange in export revenue and in import substitution savings than it required for its own imported inputs; it thus became a net demander on the foreign exchange markets of the country. Since the sectors that supplied foreign exchange—namely, agriculture and livestock—grew much more slowly than the industrial sector, in large part because of the incentive system, an imbalance developed in the rates of change of the supply and demand schedules for foreign exchange. At the same time, import substitution greatly reduced the price elasticity of

Table 5.9. *Manufacturing in Argentina: Cost and Commodity Exchange Rates as Multiples of Financial Rates, by Three-digit Sector, 1969*

Sector	Cost Rate	Commodity Rate		Sector	Cost Rate	Commodity Rate		Sector	Cost Rate	Commodity Rate		Sector	Cost Rate	Commodity Rate	
		E	D			E	D			E	D			E	D
201	.99	.91	.93	241	1.38	1.19	1.78	309	.97	1.19	2.09	379	1.23	1.19	1.78
202	1.23	.98	1.00	242	1.45	1.19	1.76	311	1.59	.97	1.88	381	1.29	1.19	2.03
203	1.53	1.13	1.06	243	1.75	1.19	1.57	312	1.01	.84	.84	382	1.39	1.19	1.84
204	1.24	1.06	1.00	244	1.81	1.19	1.69	313	1.47	1.19	1.75	383	1.56	1.19	2.12
205	.99	.90	.92	249	1.79	1.19	1.62	319	1.30	1.18	1.67	384	1.33	1.19	2.48
206	1.30	1.19	1.00	251	.87	1.19	1.81	321	1.43	1.19	1.37	385	1.20	1.19	2.27
207	.56	1.19	1.87	252	1.44	1.19	1.95	329	1.34	1.19	1.77	386	1.47	1.19	1.44
208	1.55	1.19	1.30	259	1.23	1.19	1.70	331	1.48	1.19	1.63	389	1.18	1.19	1.93
209	1.03	.92	1.14	260	1.47	1.19	1.41	332	1.48	1.19	1.76	391	1.36	1.24	1.95
211	1.71	1.19	1.52	271	1.37	1.19	1.56	333	1.37	1.19	1.33	392	1.60	1.13	1.51
212	1.16	1.19	1.50	272	1.77	1.19	1.82	334	1.61	1.19	1.15	393	1.54	1.19	2.15
213	1.29	1.19	1.50	279	1.44	1.19	1.83	339	1.43	1.19	1.28	394	.93	1.19	2.22
214	1.68	1.19	1.50	280	1.68	1.19	1.16	341	1.47	1.30	1.56	395	1.34	1.19	1.55
220	1.24	.90	1.53	291	1.16	.89	1.65	342	1.49	1.19	1.57	399	1.51	1.19	2.20
231	1.27	.97	1.56	292	1.47	1.01	.97	350	1.36	1.21	1.75				
232	1.76	1.19	1.90	293	1.31	1.19	1.12	360	1.65	1.22	1.88				
233	1.40	1.19	1.41	299	1.32	1.19	1.12	369	1.38	1.19	1.96				
239	1.36	1.19	1.51	300	1.41	1.19	2.04	370	1.41	1.16	2.28				

Note: For key to sectors, see Appendix Table 5.1.

demand for imports. The consequence was a series of balance of payments crises that had to be solved through adjustments in the domestic level of activity, as described in the introduction to this chapter. In the process of the stop-go cycle, profitability in individual sectors fluctuated even more widely than it did in the economy as a whole.[29]

As long as Argentina's incentives were biased in favor of industrial production for the domestic market, and thus toward keeping industry dependent on other sectors for foreign exchange, industrial expansion sowed the seeds of cyclical fluctuations in domestic activity through balance of payments crises. Unquestionably, import substitution can bring with it savings of foreign exchange as existing imports are replaced. Unfortunately, however, foreign exchange saving through import substitution virtually ground to a halt in Argentina fairly early. The import intensity of the same bundle of final goods showed practically no change between 1953 and 1960.[30]

The cost of Argentina's policy mix may be decomposed into several parts: a loss resulting from the cyclical underutilization of installed capacity; a loss resulting from a lower economic growth rate than could have been achieved through a more efficient allocation of resources; and a loss resulting from using capital too few hours a day in production processes that in addition may have been excessively capital intensive. These three types of losses obviously interacted in various ways. For example, resource allocation more in accord with comparative advantage would have generated more foreign exchange through exports, and thus it would not have been necessary to depress the economy to equalize the balance of payments; greater utilization of capacity would have lowered production costs, made exports more competitive, and achieved a lower capital-output ratio and higher growth; and fewer cyclical depressions would have meant higher cumulative savings and investment, and thus higher income levels.

Incentives and the Use of Resources

The empirical evidence on the employment of factors of production in Argentina is ambiguous and subject to conflicting interpretation. To provide a broadly based appraisal of the resources used under the incentive system in 1969, we undertook alternative analyses corresponding to alternative interpretations of events.

Under full employment of labor or capital, the relevant question is the traditional one of allocating resources between alternative uses. Since more cannot be had of everything, the choice of what to produce is of the essence, and thus the proper formulation of the question is whether welfare could have been greater had a different product mix been chosen or a different factor mix used. The answer lies in a comparative cost calculation and may differ depending on the time frame and the extent to which capital costs may be regarded as sunk costs (opportunities forgone).

When neither factor is fully employed, however, more of various things can be produced at the same time. Since the opportunity cost is no longer another product, comparative cost calculations are not appropriate. Instead we need to compare the marginal social cost of the factors to be utilized with the marginal social utility of the output. The answer may differ in the short and the long run, reflecting the difference between existing fixed assets, which cannot be transferred among sectors, and new investment funds, which can.

Open unemployment in Argentina is estimated at 3 to 12 percent of the urban labor force, depending upon the city and time of survey.[31] Underemployment existed in the public bureaucracy, and possibly also in the urban private sector, but there is some question as to whether such workers could have been drawn upon to expand the industrial labor force. Neither the supply of "excess" workers in rural areas nor the extent to which they could have been mobilized for industry is known with certainty.

As for capital, regular surveys conducted by the Ministry of the Economy indicate that actual rates of capacity utilization fell significantly short of entrepreneurial desires. Although this situation may reflect the "economic capacity" of a firm, defined as the rate of capital utilization that will maximize profits, that capacity in turn depends on the policy environment in which the firm operates.

COMPARATIVE COSTS AND RESOURCE PULL. We use as the index of comparative cost the direct domestic resource costs (DRC) of earning (or saving) a unit of foreign exchange.[32] This measure requires information on the shadow prices, that is, the marginal social costs, of the domestic resources utilized. Unfortunately, no carefully crafted estimates of shadow prices for Argentina exist to our knowledge, nor was it possible for us to construct such estimates within the terms of this investigation. We have thus been forced to use rough approximations derived from general considerations and to test our conclusions for sensitivity to the values used as shadow prices. In deriving shadow prices, we have used the average citizen's consumption[33] as numeraire, recognizing that the markets for labor, capital, and foreign exchange all include distortions that must be reflected in all shadow prices simultaneously.[34] Our view was that the shadow wage may lie somewhat below the market wage, and estimates were made setting the shadow wage at 0.6, 0.8, and at the full market wage.[35] In turn, we assumed

Table 5.10. *Argentina: Direct Domestic Resource Cost of Foreign Exchange, by Sector*

Domestic Resource Cost	PL = .6			PL = .8			PL = 1.0			Market Prices	
	Short Run		Long Run	Short Run		Long Run	Short Run		Long Run	PL = 1	PK = 1
	PK = 0	PK = .4	PK = 1.6	PK = 0	PK = .4	PK = 1.6	PK = 0	PK = .4	PK = 1.6		
< 0	3	3	4	3	3	4	3	3	4	3	
- 1.200	73	65	15	68	58	13	64	50	8	20	
1.201 - 1.400	2	6	7	2	6	5	4	10	8	10	
1.401 - 1.600	2	3	5	3	4	7	1	3	4	10	
1.601 - 1.800	0	1	7	1	4	6	2	5	6	7	
1.801 - 2.000	0	1	6	2	1	6	2	2	8	8	
2.001 - 2.500	0	2	18	1	2	17	3	3	14	13	
2.501 - 3.000	0	0	10	0	3	13	1	3	14	4	
> 3.0	2	1	10	2	1	11	2	3	16	7	

Note: PL denotes the wage rate and PK the price of capital. The assumptions made about shadow prices are explained in the text.

that the shadow price of investment lay above its market price, and chose the value 1.6 for our calculations.[36]

In our estimates of comparative costs, we have distinguished between the short run, when capital costs can be regarded as sunk because the capacity is already there, and the long run when new investment needs to be undertaken. To recognize, however, that existing capacity may under certain circumstances have a user cost, we have prepared two sets of estimates of short-run comparative costs: in one we value the capital input at zero, assuming that machines are replaced because of technological obsolescence and not because they are worn out; and in a second calculation we value 25 percent of capital at its shadow price, thus incorporating the assumption that some fraction of capital stock is replaced because of wear and tear.

The various assumptions on shadow prices and on the user cost of capital yield a total of three long-run and six short-run estimates. The rank order correlation coefficients between these indicators are quite high. Within the long-run group, the lowest Spearman coefficient is 0.97. In addition, substituting shadow pricing for market pricing does not seem to affect the ranking much (the lowest Spearman value is 0.86). The implication is that the comparative advantage of Argentina is clearly defined and stable with respect to variations in factor costs.[37]

Within the short-run group, the lowest correlation is 0.72. Correlating shadow price and market price indicators of domestic resource costs yields the lowest Spearman coefficient, 0.53. Finally, rank correlation coefficients between short-run and long-run orderings for comparable shadow prices are also relatively high and thus indicate the stability of the comparative cost ranking over different time horizons.

The distribution of the domestic resource cost ratios is shown in Table 5.10. The data indicate that there was ample scope for increasing welfare through reallocating resources. In turn, Table 5.11 shows the maximum and minimum values of DRC among the ten industry groups. It is apparent that costs vary widely within each category as well as between the short and the long run, and that the DRC ratios overlap considerably between industry groups. This overlap implies that Argentina's comparative advantages and disadvantages are spread throughout the industrial sector. For a country in such circumstances, the introduction of a policy to exploit comparative advantage would stimulate a considerable reallocation not only among sectors but also within them.

Ideally, the incentives should be structured to draw resources into those activities in which the economy has a comparative advantage. Table 5.12 indicates the extent of correlation among Argentina's various incentive measures and the direct domestic resource cost of foreign exchange.[38] For domestic and for total sales, DRC values appear to be highly correlated with effective protection and subsidy rates on value added, and less so with the cash flow indicators. Finally the correlation with incentives to export is practically nil.

BENEFIT-COST ANALYSIS OF GREATER CAPACITY UTILIZATION IN THE SHORT RUN. The underutilization of Argentina's capital stock and the fluctuations in its use have been well documented;[39] the capacity utilization rates for 1969 vary between 54 and 90 percent, most sectors being in the 60 to 75 percent range.[40] Although the data come from responses by entrepreneurs to questionnaires sent out by the Ministry of the Economy and are undoubtedly subject to error, they leave little doubt that output could have been expanded in the short run without additional investment.[41] If unemployed labor was available, it would have been possible to expand output along several product lines while sacrificing only the leisure of the unemployed and the user cost of capital.

To provide the proper framework for sectoral analysis of this type, one must compute the direct domestic resource cost of foreign exchange in each activity and compare it with the value (shadow price) of that foreign exchange. The shadow prices in this case differ somewhat from those consistent with the assumptions underlying comparative cost analysis. Here, the assumption is either that the suppliers of the labor concerned are unemployed altogether, in which case their shadow price is equal to the marginal utility of their leisure, or that they are employed at very low levels of productivity, in which case their marginal social productivity is a fraction of the urban market wage. In either case, the shadow wage under these assumptions may not exceed 0.6 and may be as low as 0.4 of the market wage. We have thus chosen to use this range for the respective estimates.

The shadow price of capital will in this case be higher than in our previous analysis, simply because the shadow wage is lower. We take values of 1.6 to 1.8 to signify this situation, and also assume that the user cost of capital is 25 percent of new investment cost. Thus the two sets of shadow prices yield a total of six combinations.

The results are highly instructive: some 63 percent of the three-digit sectors had DRC below 1, that is, lower than the official exchange rate; more than 80 percent of the sectors had DRC below 1.2, and more than 90 percent had DRC below 2. Under a foreign exchange constraint such as affected Argentina, the shadow price of foreign exchange would certainly be at least 20 percent above the official rate, and might well be higher. Thus, it is reasonable to conclude that in the majority of sectors the marginal social utility of additional output would have

Table 5.11. *Argentina: Range of Direct Domestic Resource Cost of Foreign Exchange, by Industry Group*

		PL = .6			PL = .8			PL = 1.0		
		Short Run		Long Run	Short Run		Long Run	Short Run		Long Run
		PK = 0	PK = .4	PK = 1.6	PK = 0	PK = .4	PK = 1.6	PK = 0	PK = .4	PK = 1.6
Primary Activities (I & IV)	Max	1.1	0.9	2.0	1.4	1.2	2.1	1.8	1.6	2.0
	Min	0.1	0.4	0.2	0.2	0.5	0.6	0.2	0.5	1.0
Processed Foods (II)	Max	-1.2	-1.6	-2.8	-1.5	-1.9	-3.2	-1.9	-2.3	-3.5
	Min	0.1	0.4	0.3	0.6	0.5	0.5	0.2	0.5	1.0
Beverages & Tobacco (III)	Max	0.4	1.3	3.9	0.5	1.4	4.1	0.6	1.5	4.2
	Min	0.1	0.6	1.4	0.2	0.6	1.5	0.2	0.7	1.6
Construction Materials (V)	Max	0.3	0.8	2.2	0.5	0.9	2.3	0.6	1.0	2.4
	Min	0.2	0.5	1.3	0.3	0.5	1.4	0.3	0.6	1.5
Intermediate Goods I (VIA)	Max	-1.1	-4.3	-13.9	-1.4	-4.6	-14.3	-1.8	-5.0	-14.6
	Min	0.1	0.5	0.9	0.3	0.5	1.1	0.2	0.6	1.2
Intermediate Goods II (VIB)	Max	10.6	18.6	-3.7	14.1	22.2	-2.6	17.7	25.7	-1.5
	Min	0.3	0.7	1.1	0.4	0.8	1.5	0.5	0.9	2.0
Nondurable Consumer Goods (VII)	Max	-8.4	-15.5	-36.8	-18.4	-18.3	-39.6	-14.0	-21.1	-42.4
	Min	0.2	0.5	0.8	0.2	0.7	1.0	0.3	0.7	1.9
Consumer Durables (VIII)	Max	1.6	1.9	4.3	2.1	2.3	4.7	2.6	2.8	5.1
	Min	0.4	0.7	1.5	0.6	0.8	1.6	0.7	1.0	1.7
Machinery (IX)	Max	0.7	1.3	2.9	1.0	1.5	3.1	1.2	1.8	3.4
	Min	0.2	0.8	2.5	0.2	0.9	2.7	0.3	1.0	2.8
Transport Equipment (X)	Max	1.2	1.6	3.5	1.6	1.9	3.7	2.0	2.3	3.9
	Min	0.6	0.7	1.3	0.8	0.9	1.5	1.0	1.1	1.7

Note: PL denotes the wage rate and PK the price of capital. The assumptions made about shadow prices are explained in the text.

Table 5.12. *Argentina: Spearman Rank Order Correlation of Incentives and Domestic Resource Costs, 1969*

DRC		Net Effective Protection						Net Effective Subsidy					
		To Value Added			To Cash Flow			To Value Added			To Cash Flow		
		E	D	A	E	D	A	E	D	A	E	D	A
PL	PK												
.6	0	.53	.52	-.06	.36	.39	.26	.53	.51	0.03	.15	.17	.23
.6	1.6	.86	.82	-.12	.57	.52	.22	.86	.83	-.05	.47	.44	.19
.8	0	.53	.52	-.06	.36	.39	.26	.53	.51	0.02	.15	.17	.23
.8	1.6	.90	.86	-.14	.60	.56	.25	.90	.86	-.06	.47	.43	.21
Market Price		1.00	.95	-.11	.68	.66	.26	1.00	.96	-.02	.47	.45	.21

Note: PL denotes the wage rate and PK the price of capital. The assumptions made about shadow prices are explained in the text.

substantially exceeded the marginal social cost of the factors used.

UNDERUTILIZATION OF CAPITAL STOCK IN THE LONG RUN. Most empirical measurements of capital utilization, as well as most analytical concern, have been directed toward utilization that falls short of what entrepreneurs regard as normal. The principal cause of such shortfalls in Argentina has lain in the restriction on demand needed to maintain the balance of external payments under the foreign exchange constraint introduced by the incentive system. The implication, naturally, is that the incentive system was indirectly the cause of the low level of utilization and that as long as the incentive system remained unchanged, this type of underutilization would persist.

A more fundamental question is whether the levels of capital use desired by entrepreneurs were appropriate for the underlying conditions in the Argentine economy. Any difference between the utilization rate that maximizes private profits and the rate that maximizes social welfare will give rise to a loss in output. This is because the utilization rate that maximizes social welfare is calculated at shadow prices of inputs and outputs and may involve the use of additional shifts, which are not profitable at private prices.

No measures of either the socially optimal level of utilization or of the number of shifts worked in Argentine industry are available. Nonetheless, recent theoretical and empirical work in the area of capital utilization makes it possible to assess the distortions introduced by the incentive system.[42]

Many recent studies on utilization have worked with neoclassical profit-maximizing models and have attempted to estimate the elasticity of multiple shifting with regard to factor prices. From our point of view, the findings of importance relate to the effects on capacity utilization of the prices of capital and labor as well as of tax legislation and the credit system. A higher relative price of capital to labor encourages the use of installed capacity. Policies that make capital goods available cheaply, whether through exemptions from tariffs and taxes or through cheap credit, have the opposite effect. In Argentina, legislated rates of protection for capital goods imports were high, and in 1969 nominal protection stood at 87 percent for machinery (Appendix Table 5.1). Exemptions, however, had eroded the import duties collected to the point that the duty paid equaled only 19 percent of the c.i.f. price. A bias in favor of single shifting (and capital-intensive processes) was thereby built into the incentive system.

A further reason for the underutilization of capacity lay in the structure of interest rates and the types of guarantee needed for loans. Interest rates on working capital were higher than on capital goods, and since loans were granted with a view less to the future cash flow of the enterprise than to the real guarantees that could be pledged by the borrower, the result was a bias against the utilization of capital. This source of bias exacerbated the bias caused by the shadow wage rate

being below the market wage and the shadow price of capital being above the market price.

Policy Recommendations

The policy recommendations in this section grow out of our analysis of the structure of Argentina's incentive system and its effect on the country's economic growth since the end of World War II. We preface our recommendations with a discussion of the goals that incentive policy should pursue as well as the constraints it faces.

Many of the ultimate goals of Argentina's economic policy are similar to those of other countries: a high and rising standard of living, low unemployment, and equitable income distribution. Argentina has two further goals: permanent reductions in the rate of inflation and in the extent of economic fluctuations. A suitable incentive policy would require that the principal obstacles to achieving these ultimate goals be identified and proximate objectives for the incentive policy be determined.

The most serious obstacles to achieving Argentina's policy objectives are the stop-go cycle of growth and the accompanying cycle of inflation and devaluation. These cycles have been brought on by the import-substituting character of the Argentine growth process and the anti-export bias in the incentive system. The most important proximate policy goal is the elimination of the balance of payments constraint. This goal requires reform of the incentive system to make it stable over time and not biased against exports. Such a reform would go far in making Argentina's growth continuous and self-sustaining at a respectably high rate. Argentina's post-war history demonstrates, however, that such a policy can be sustained only if it takes account of the need to respect a functional and sectoral income distribution that is acceptable to the major pressure groups in the economy. Real wages must not fall and income must not be redistributed from the city to the country. If either of these restrictions is violated to a large extent and for a prolonged period, the policy is likely to be unsustainable.[43] The first proximate goal thus requires a program that combines policies for the balance of payments, domestic prices, fiscal balance, income distribution, and money and credit.

The second and third proximate goals are improved utilization and allocation of resources, respectively. To some extent, full utilization of both capital and labor will be achieved automatically as income rises in response to the elimination of the foreign exchange constraint. As long as distortions exist in domestic factor markets, however, the relative factor intensities employed will be inappropriate to factor availabilities and hence, at any level of capital stock, both labor and capital will tend to be less than fully employed.[44] The second proximate goal hence requires that the incentive policy include measures to bring the market prices for factors closer to their social opportunity costs. These measures should concern wages, the cost of capital goods and of credit, and taxation.

The elimination of the foreign exchange constraint will also help to make resource allocation more efficient. But the principal way to achieve the third proximate goal is to reform tariffs and export subsidies to bring the incentive structure more closely into line with the country's comparative advantage. These reforms would complement the measures on factor prices that constitute the core of policies aimed at the second proximate goal and would reinforce the policies aimed at removing the foreign exchange constraint (first proximate goal).

The next three sections discuss measures to achieve the three proximate goals. In view of the close interactions among them, the three goals must form a consistent policy package. Furthermore, it may be desirable to establish incentives that change over time in a prespecified way, responding to changes in conditions (particularly the convergence of the shadow and market prices of labor) and prodding the economic actors to respond by preannouncing future changes.

Policy to Overcome the Trade Constraint

An effective policy for this purpose has to consist of simultaneous and interrelated measures in several areas: balance of payments, domestic prices, fiscal balance, income distribution, and monetary policy.[45]

BALANCE OF PAYMENTS POLICY. The basic element in the suggested balance of payments policy is the adoption of a moving peg exchange rate, so that the domestic currency will depreciate at least as fast as the decrease in the excess of the domestic over the international rate of inflation. This peg would initially be a running peg, later on become a moving peg, and eventually become a true crawling peg. In any of these stages, it would have the highly beneficial effect of preventing the swings in the balance of payments and level of economic activity that have been such a marked feature of the Argentine economic landscape. The stop-go and inflation-devaluation cycles would no longer be fueled by abrupt changes in the ratio of domestic to foreign or agricultural to industrial prices. Nor would recessions continue to cause irrecoverable income losses. Finally, the means would be at hand to offset changes in world inflation.

Respectable rates of economic growth, however, can be achieved only through a substantial increase in foreign exchange receipts. The most effective way of generating such an increase in foreign exchange is to empha-

size export expansion in *both* agriculture and industry. If such a comprehensive strategy cannot be implemented immediately, industrial exports alone could be used to lead the way.

Exports will expand only if their prices are made more attractive. The policy adopted must therefore increase the number of pesos that industrial and agricultural exporters receive per dollar of sales in foreign markets. In other words, the exchange rates for exports of both industrial and agricultural goods must be raised. A simple way to increase these exchange rates is through a substantial once-and-for-all devaluation, additional to the moving peg. To avoid causing substantial changes in the domestic prices of industrial goods, this devaluation would need to be offset by reductions in import duties.[46]

As for agriculture, devaluations in Argentina have traditionally been accompanied by an export tax designed to mop up the windfall profits that would otherwise have accrued to exporters from the devaluation, and also to prevent the domestic prices of agricultural goods from rising. When a devaluation is fully offset in this manner, its effects on agricultural products are annulled, and any incentive for expanding production and exports is removed. Measures to preserve the incentive effects of a devaluation need to be concerned only with profitability at the margin. The profitability of new production should increase, but there is no need for existing production to become more profitable as well. Therefore the tax on agricultural land should be increased by an amount equal to the increase in the value of existing agricultural output resulting from the devaluation.[47] On their existing output, agricultural producers would thus earn the same amount of pesos, after devaluation and payment of their tax, as they did before devaluation and without the tax. While new output would be substantially more profitable than before, since it is not liable for land tax, the full benefit of the higher price of foreign exchange would accrue to the producer.

The comprehensive balance of payments policy thus has two features: a moving peg to prevent internal cost and price pressures from spilling over into the external sector; and a rise in profitability for new foreign exchange earning activities, whether in industrial exports or in primary exports, both of which obtain a higher yield. At the same time, however, the profitability of *existing* agricultural output, regardless of where it is marketed, would remain unchanged.

Starting from the 1969 system of incentives, a reasonable order of magnitude for such a compensated devaluation would be 30 to 40 percent. The devaluation would be offset largely by tariff reductions on imports (in 1969 only 17 sectors out of 77 had nominal protection on domestic sales below 30 percent, and 20 had rates below 40 percent).

In the production of manufactured exports such a devaluation would compensate to some extent for the high costs of inputs. But since only 38 sectors out of 77 had cost exchange rates that exceeded the financial exchange rate by less than 40 percent (see the section "Effective Incentives, 1969" and Table 5.9), and another 17 lay between an excess of 40 and 50 percent, some excess cost of inputs would remain. Furthermore, it should be borne in mind that the majority of sectors had gross effective rates of protection above 40 percent. This means that a uniform 30 to 40 percent effective rate of protection, as given by the partially compensated devaluation envisaged, would not be enough to maintain factor payments in export production at levels equivalent to those obtainable in production to be sold locally. It would thus be necessary to maintain some of the existing export incentives for a time, in order to make a sufficient range of products competitive in the export market and to allow scale and productivity increases to lower production costs over time, as well as to permit foreign markets to be penetrated.[48]

One should further consider the possibility of using reductions in protection on domestic sales as a tool to push producers into the export market. (The desirability of tariff reductions on resource-allocation grounds is discussed later in this section.) The main argument in favor of such a policy is that firms will become less complacent and more efficient if obliged to face some import competition. The counterargument, however, notes: first, firms are less likely to take export risks if their home market is not safe; second, price reductions in the home market make it harder to sell abroad at marginal cost; and third, under monopolistic market structures, a lowering of the tariff may reduce the exportable surplus by increasing domestic demand at a lower price. An appropriate solution may be to phase tariff reductions so as to reinforce the demand pull resulting from the export policy, while avoiding disrupting production.

If a comprehensive policy of the kind outlined cannot be implemented immediately—perhaps because of political resistance to a high land tax—one might implement the industrial part of the package independently and substitute the land tax for the export tax in several gradual steps. The industrial part of the package might also be implemented in steps, involving the temporary application of export subsidies.[49]

The final objective is the same: to raise the foreign exchange earned by *both* agriculture and industry without causing major shifts in sectoral incomes from existing production. Sequencing over time would allow the industrial sector to lead while providing time for agricultural producers to realize that the new land tax is to their advantage rather than their detriment. Such

sequencing would also allow city dwellers to adjust more gradually to changes in relative prices. To introduce such measures gradually over time requires a strong commitment from the government; if only part of a phased plan is implemented, it will be correspondingly less effective in removing the foreign exchange constraint. Hence the attractiveness of a once-and-for-all solution.

Any policy should provide measures to offset temporary changes in world market prices—particularly unsustainable increases in meat or grain prices. For such purposes export taxes should be used on a strictly temporary basis to absorb the windfall.

DOMESTIC PRICE POLICY. The first element of the domestic price policy is the counterpart of the moving peg; it consists of slowing the domestic price spiral by agreement. Wages in real terms are guaranteed, and increases in money wages are based on expected increases in prices. Prices in turn are held in check by government pressure, on the basis of a slowdown in money wage increases.[50] At the same time, a monetary readjustment provision is added to interest and tax payments, so that the rates quoted on the money market become real rates rather than being distorted by inflation, and taxes fall on real profits rather than on apparent inflationary ones.

The second task of domestic price policy is to offset the effect of the increase in agricultural prices caused by devaluation. Since the balance of payments policy just outlined contemplates no export tax to offset the increase in exchange rate, but rather uses a land tax to absorb the windfall gained by farmers, the domestic prices of agricultural products will necessarily rise. Such a price increase would cause a fall in real urban incomes and, in particular, a fall in real wages. To offset this development, either the prices of industrial goods must be brought down or urban disposable income must be raised. (Prices of industrial products on the domestic market will not generally rise with the devaluation, owing to the offsetting reduction of import duties.) To bring the prices of industrial goods down, it becomes necessary to act further on tax policy, specifically by removing indirect taxes on industrial goods. Increases in real disposable income can be achieved by reducing personal income tax, or by introducing a negative income tax, as well as by reducing the social security contributions deducted from the income checks of salary recipients.

The reduction in real urban incomes caused by higher agricultural prices would thus be offset by a reduction in indirect taxes on industrial products, a reduction in the tax load borne by personal income recipients, or the introduction of a negative income tax.

A complicating element here is the fact that the poorest people spend the highest proportion of their budget on food and are thus hardest hit by the change in relative prices. With a compensated devaluation of 30 to 40 percent, the relative price of food would rise by approximately as much. The amount to be offset is thus considerable. When lower income groups cannot easily be reached by income tax deduction or by government services, compensation is even more difficult. A negative income tax may be indispensable in such a situation.[51]

In a phased policy, the need to offset agricultural price increases is correspondingly spread over time and reduced. Therein lies one of the attractions of phasing. Yet therein lies also one of the dangers, for resistance to increases in the price of food, even if compensated by fiscal measures, is typically considerable and can be cumulative.

FISCAL BALANCE. The fiscal balance under the full one-time package is affected by the removal of import duties, reductions in export incentives, removal of sales taxes, reductions of personal income taxes, negative income taxes, and increases in the land tax. For the package to be feasible, the net amount of fiscal revenue must not fall by a substantial amount.

The net result of the devaluation and the increased land tax would be a rise in the fiscal revenues collected from the agricultural sector. Since the new level of the land tax would prevent farmers from increasing the money income from their existing production, the revenue from the land tax would go up by the value of output multiplied by the peso magnitude of the devaluation. In turn, the government would lose the revenue it used to receive from import duties. The revenue thus lost would approximately equal the percentage devaluation multiplied by the (predevaluation peso) value of imports. Under balanced trade, a 1 percent duty on imports yields the same amount as a 1 percent tax on exports. Hence we can expect that the revenue lost from removing import taxes would be offset almost exactly by that part of the increased land tax revenue corresponding to the agricultural output exported.[52] Thus far, the increase in government revenues would approximately equal that part of the increased land tax corresponding to agricultural output sold on the domestic market.[53]

It remains to be seen whether this amount of revenue would be sufficient to cover the reductions in taxes (or increases in subsidies) necessary to maintain real incomes in the cities. A precise answer cannot be obtained, since information is not available on the propensities of the income recipients to spend on different types of

goods. Nonetheless, the following orders of magnitude provide an indication of possible changes.

We have seen that the increase in government revenue would be approximately equal to the increase in sales value of agricultural products sold on the domestic market that would be caused by the devaluation.[54] Thus, a reduction in other government taxes of an amount equal to this revenue should restore the purchasing power of consumers to its previous level.[55]

The fiscal balance would also be affected by the revenue from the increase in export earnings stimulated by the compensated devaluation. With the expansion of exports and the greater availability of foreign exchange, existing industrial capacity would be mobilized and would generate wages and profits as well as tax revenue, in addition to new imports and tariff revenues. Argentina's pursuit of an import-substitution strategy has greatly reduced the import coefficient, and the fiscal and income multipliers of export revenue are correspondingly high.[56] Thus, on this score, the proposed package could be expected to yield a fiscal dividend.

In addition, the government would receive new revenue as higher and more stable rates of growth resulted from improved resource allocation, from the use of new savings, and from increases in the labor force. The resulting fiscal dividend could cover any deficit that the package itself might produce; indeed, one would expect it to permit the gradual reduction of the fiscal deficit of the public sector.

A phased policy would have the same fiscal effects as the single stage policy, though stretched out over time. Under phasing, the fiscal effects of the increased export subsidy would be particularly important. As argued above, such a subsidy may pay for itself out of the new tax revenue collected on the higher level of economic activity made possible by the exports. There must not be too much lag, however, between the disbursement of the subsidy and the collection of the respective taxes. Fortunately, it appears that more than 70 percent of the new tax revenue would be collected within twelve months of the exports leaving port.[57] The remaining 30 percent could certainly be financed on a short-term revolving basis in the world capital market during a transitional period, while the fiscal dividends begin to be realized.

INCOMES POLICY. Since the policy interventions must not raise agricultural incomes at the expense of city incomes, nor labor incomes at the expense of profits, or vice versa, the effects of the tax and balance of payments measures proposed on the various income groups must be considered.

Agricultural incomes from existing output would rise owing to the devaluation, but this increase would be taxed away by the increased land tax so that any increase in agricultural income would derive only from increased output in response to the new price incentives. Industrial profits would go up after devaluation; however, the offsetting reduction of import duties would keep profits on domestic sales at approximately their original level. The only source of increase in industrial profits would be the expansion in industrial exports to foreign markets. Wage earners would find their real income reduced because of increases in agricultural prices, but they would be compensated through reductions in taxes on their consumption or incomes. Thus, at the existing level of output there would be no change in income distribution. The policy package would change only the income that agriculture earns from additional output and that industry earns from additional output sold abroad. Both these increases are naturally shared with labor: employment can be expected to rise in the first instance and real wages can be expected to rise at higher output levels.

MONETARY POLICY. The main role of monetary policy in this context is to provide the economy with sufficient liquidity to accommodate the increase in output of both agriculture and industry that the other policy tools are designed to call forth. Hence the share of new credit going to the private sector would increase, while the share of the government would decrease, in part as a reflection of the improvement in the budget discussed above.

Some active intervention is essential, however, in the regulation of speculative international money flows. Such flows have been destabilizing in the past, and a policy of interest arbitrage would be not only helpful in stabilizing the reserves of the Central Bank, but also vital to the effective working of the moving peg. The introduction of a monetary correction factor on the interest rate, discussed under price policy above, would help achieve this goal.

Policy for the Full Utilization of Resources

Designing a policy to achieve the full utilization of the existing capital stock and labor force involves two different problems: to raise the utilization rate of existing capital, and to raise the planned rate at which new capital will be used.

One of the main reasons for the underutilization of existing plant and equipment is the relationship between the marginal revenue and the marginal cost of additional output from existing capital. The former is low because of the limitations of the (domestic) market; the latter is high because the incentive system discriminates against the use of multiple shift. The export orientation sug-

gested for dealing with the exchange constraint opens up a new (foreign) market to domestic producers, and, to the extent that output increases, it generates a multiplier effect that expands the local market. Both effects imply an increase in the revenue obtained from additional sales by domestic producers. Reduction of the marginal cost of second- (or third-) shift production requires special policy measures aimed at offsetting or eliminating the current implicit or explicit taxation of such output. These measures cover credit policy, tax policy, and policy toward the cost of labor.

CREDIT POLICY. The structure of interest rates in Argentina is tilted toward low rates for long-term investment, that is, the purchase of capital goods, and high rates for working capital. We propose that for the medium term (three to five years) this tilt be reversed, that preference be given to working capital loans, and thereafter that rates be equalized. Furthermore, banks should be encouraged to lend on the basis of expected cash flow, rather than against the security of pieces of equipment. Working capital loans should receive preferential interest rates in the three to five years during which the rate of capital utilization is raised and some extra incentive is needed to overcome inertia, and labor still has a shadow price below its market wage.

TAX POLICY. Depreciation allowances should be made proportional to the intensity of use rather than be given a legislated fixed life. Such a change could eliminate the effectively higher corporate tax rate on profits realized from second- and third-shift output.

POLICY ON THE COST OF LABOR. Policies are required to reduce the difference in labor costs between first and later shifts (that is, the wage premiums for additional shifts) and to reduce the risk associated with expanding the firm's labor force to work an experimental second or third shift and then finding it expensive or impossible to dismiss the new workers if the shift turns out to be unprofitable. To address the first problem, the wage premium could be offset by a tax deduction that would equal the cost of the premium to the firm minus the marginal tax rate. The second problem could be dealt with by hiring workers on probation for a second (or third) shift, so that entrepreneurs who find a new shift not profitable are not liable for severance payments.

Both the tax policy and the cost-of-labor policy recommendations imply lower revenue or higher expenditure for the treasury, whereas our proposed measures would in all likelihood cause a net increase in revenue, since the tax base would rise (owing to the higher rates of capital and labor use) and the new output would yield some tax revenue. Net revenues would decrease, however, if the measures were applied not only to new but also to existing multiple shifts. A strong recommendation on this issue requires data that are not available on the practice of multiple shifts.

The measures proposed will encourage the full use of new capital. It remains to synchronize them with policy on the price of capital goods. We have estimated that the nominal protection of capital goods in 1969 was 87 percent (the rate for machinery), but rates of tariff on a large proportion of *imported* capital goods were no more than 13 to 37 percent. These figures imply an incentive to use overly capital-intensive techniques of production and to underutilize the capital, once installed. In such circumstances, we recommend eliminating all import exemptions for capital goods. To offset the depressing effect this might have on private investment, it would be desirable to earmark tariff revenue from the import of capital goods for lending to the private sector through the development banks. Finally, investment incentives should be made more readily available to firms operating multiple shifts, and perhaps explicit justification should be required from those planning single shifts.

Policy to Improve the Allocation of Resources

Resources are optimally allocated when, at the margin, the domestic resource cost of foreign exchange, measured at shadow prices, is equal in all activities. Under conditions of decreasing returns to scale in all sectors, if foreign supply and demand elasticities are infinite for all products, and if market and shadow prices are equal, the optimal trade policy is free trade or, in its absence, uniform effective protection for all sectors. Correspondingly, the optimal domestic tax policy is a uniform taxation of value added.[58] When shadow prices differ from market prices, uniform effective protection will no longer be optimal. It would then be desirable to differentiate protection in a manner that offsets the difference between the market and the shadow prices of the various factors and takes account of the incidence of each factor's cost on value added in the various sectors.[59] Differing foreign elasticities between products also justify nonuniform rates of protection and domestic taxation.

When some sectors produce under constant or decreasing returns to scale and when market and shadow prices are equal, free trade or a uniform effective tariff will still be optimal but will encourage a high degree of industrial specialization. The loss of flexibility suffered by an economy at such a level of specialization, and the attendant cost of reallocation, reduce the attractiveness of such a policy. Were shadow prices to differ from market prices, additional differentials in the tariff would have to be introduced for compensatory purposes.

Again, domestic taxation could help to achieve these goals.

Although a reform of the Argentinian system of incentives should take into account the need to maintain a diversified economy, the policy recommendations outlined above are likely to reduce the divergences between market and shadow prices—to a large extent for labor, to an important extent for foreign exchange, and to some extent for capital. In such a context, it would seem appropriate to narrow the range of effective protection gradually while attempting to reduce differences between the market and the shadow prices of factors. For the medium term, a range of 20 to 30 percent among effective protection rates may be reasonable. The compensated devaluation suggested earlier in this section would contribute to this narrowing of differentials in effective rates, insofar as full compensation through tariff reduction is not possible if tariffs are lower than the amount of the devaluation. In addition, it would bring closer together the incentives to exports and to production for domestic markets. The purpose of narrowing the range of effective protection rates would also be served by reducing the very high rates more than proportionately. The reform should also pay attention to production receiving negative rates of protection, in which value added at world market prices is negative.

These reforms can be implemented relatively rapidly once the policies recommended for eliminating the foreign exchange constraint and moving toward full utilization of resources begin to take hold. Under conditions of rapid growth, the reallocation implicit in the tariff reform suggested here could be effected more readily than in a stagnant economy. It would still seem advisable not to implement the full reform all at once, but to divide it into two or three preannounced stages, to allow firms to adjust more gradually to the new environment.

Changes in domestic incentives should aim at improving the allocation of resources by reducing differences between market and shadow prices. The principal policies that can be used for that purpose have already been discussed.

The Relative Priority and Importance of the Policy Reforms

Rarely is a government able to undertake all the reforms that are desirable. It seems appropriate to indicate the relative priority we assign to the various recommendations put forward here and the relative contributions they can be expected to make to the goals enunciated.

The sequence in which we have treated the proximate objectives reflects our view of their relative importance. We regard the foreign exchange constraint as the most serious obstacle to an improvement in Argentina's economic welfare. If the foreign exchange constraint is not removed, it will be extremely difficult to achieve the full utilization of resources because the possibilities for additional import substitution will be limited. If the foreign exchange constraint is removed, the next order of priority will be the utilization of idle resources. Economic welfare can be increased most quickly and least painfully by putting idle resources to work, rather than by reallocating the resources already employed. It is also important to improve allocation, but the difficulty and the time needed to effect significant improvements lead us to rank this objective third.

Of the policy instruments proposed, the moving peg makes the greatest contribution to the stability of the incentive system and hence of the national economy. If a moving peg is not instituted, the other measures suggested are likely to be overwhelmed by the distortions introduced in successive periods of over- and undervaluation. Only when the benefits and costs of trade are relatively stable over a long period, and are expected to continue to be stable, will expectations stabilize.

The compensated devaluation, complemented by a land tax in the place of an export tax, is a package that should be implemented in entirety. If this cannot be done, one of the alternatives mentioned above should be pursued instead. Only if the marginal incentives to agriculture and industry are changed without affecting the rural-urban income distribution can there be any hope of the lasting modification in incentives that is needed to overcome the foreign exchange constraint.

Some of the difficulties of maintaining the shares of different groups in the size distribution of income deserve close attention. The overall effects on growth of breaking the foreign exchange bottleneck are likely to overpower any negative short-run effects on the income of a particular group. Since the foreign exchange constraint will not vanish instantly when the proposed policies are implemented, and the effects on income distribution will be felt rapidly, this problem would need to be dealt with.

It should be emphasized that a compensated devaluation cum land tax or its substitutes would have important effects on the utilization and allocation of resources in addition to playing a fundamental role in breaking the foreign exchange bottleneck. Thus any of these alternatives would help achieve all three proximate policy targets.

The adoption of the remaining policy instruments recommended should be guided by simplicity of design and ease of implementation. We would put the measures affecting the interest rate first, the explicit tax measures second, and the measures affecting the cost of labor, along with the reform of the whole tariff system, third.

Any one of these measures may be designed and introduced on its own and none depends on the simultaneous implementation of the others. All of them, however, depend for reasonable success on the implementation of the moving peg and a compensated devaluation.

Notes to Chapter 5

1. The introductory section of this chapter draws extensively on M. Diamand, *Doctrinas Economicas, Desarrollo e Independencia* (Buenos Aires: Paidos, 1973); R. D. Mallon and J. V. Sourrouille, *Economic Policy Making in a Conflict Society: The Argentine Case* (Cambridge, Mass.: Harvard University Press, 1975); C. F. Diaz-Alejandro, *Essays on the Economic History of the Argentine Republic* (New Haven, Conn.: Yale University Press, 1970); M. Brodersohn (ed.), *Estrategias de Industrializacion para la Argentina* (Buenos Aires: Instituto Torcuato di Tella, 1970), particularly the article in the latter by David Felix and comment thereon by D. M. Schydlowsky.

2. It should be mentioned that official customs valuations were in use well before the 1967 tariff reform.

3. Data on special regimes are available from the authors on request.

4. Abot, Abranzon, Chorne, Farina, Khavisse, Torre, "La Concentracion en la Industria Argentina en 1964" (Buenos Aires: Consejo Nacional de Desarrollo [CONADE], 1969).

5. The first group comprised sectors with less than forty producers, of which no more than eight produced at least 50 percent of the sector's output. The middle group contained sectors with more than forty firms, of which fewer than five produced at least 50 percent of the output. The remaining sectors were considered competitive.

6. Details on the methodology are available from the authors.

7. In the event, the tax court upheld the authorities. Cf. R. O. Amigo, "Recupero de Impuestos y Gravamenes sobre las Rentas," *Boletin de la Direccion General Impositiva*, November 1974.

8. Note that although tariff escalation was an explicit part of the 1967 reform, it existed naturally before that reform.

9. As explained in the previous section, nominal protection on exports does not include the value of the tax-free provision of the tax reimbursement, which is counted as a tax benefit.

10. In subsequent years, however, the changes in international prices reduced this discrimination, since domestic prices rose by less than world prices.

11. The rate was 1.6 percent on unimproved land; the value of improvements was assumed to be 30 percent of the improved land value, unless otherwise explicitly stated. Thus, 1.6 percent on 70 percent of assessed value, excluding improvements, equaled 1.12 percent on land value including improvements.

12. Law 20520 (Nationalization of Deposits) changed the operating rules of the banking system as of September 1, 1973.

13. A survey of corporate balance sheets was undertaken by the Fundacion de Investigaciones Economicas Latinoamericanos (FIEL), and agricultural balance sheets were sampled for purposes of our study.

14. Further details on data sources and uses are available on request from the authors.

15. L. F. Herrman and R. E. Branson, *A Program for Stabilizing Argentine Beef Exports*, Special Report to CAFADE/USAID Argentina (Buenos Aires, 1962); G. Norea, "British Demand for Argentinean Beef" (Lafayette, Ind.: Purdue University, 1967; processed).

16. The figure for price elasticity of supply was estimated by Reca and is quoted in Mallon and Sourrouille, *Economic Policy Making in a Conflict Society*. Carlos Diaz-Alejandro reports the domestic demand elasticity in *Exchange Rate Devaluation in a Semi-industrialized Country: The Experience of Argentina* (Cambridge, Mass.: M.I.T. Press, 1965).

17. Jonathan Eaton, "Effective Devaluation as an Export Incentive in Less Developed Countries," B.A. thesis, Harvard University Department of Economics, Cambridge, Mass., 1972.

18. The rate of net effective protection on import-competing primary exports is shown as not defined (n.d.) in Table 5.5. In this category, there were no exports.

19. It should be remembered that all these calculations are based on a constant real wage, so that transfers of income to and from profit earners are assumed not to affect wage income but rather to result in offsetting changes in government income and in rent. In agriculture, however, the profit and rental element could not be distinguished from one another.

20. On the method of treating cases of negative world market value added, see Chapter 2.

21. For comparability with previous studies, gross (unadjusted) rates were used in this analysis. This regression excludes sectors with negative value added at world prices, since no compatible cardinal scale can be constructed that is usable at the same time for effective rates with positive and negative value added. On this point see Stephen E. Guisinger, "Negative Value Added and the Theory of Protection," *Quarterly Journal of Economics*, vol. 85 (August 1971).

22. Benjamin I. Cohen, "The Use of Effective Tariffs," *Journal of Political Economy*, vol. 79 (1971).

23. For an extensive discussion of the interpretation of correlations of nominal and effective rates, see Stephen E. Guisinger and D. M. Schydlowsky, "The Empirical Relationship between Nominal and Effective Tariff Protection," Discussion Paper, no. 152 (Cambridge, Mass.: Harvard University Institute of Economic Research, 1970; processed); and Herbert G. Grubel and Harry G. Johnson (eds.), *Effective Tariff Protection* (Geneva: General Agreement on Tariffs and Trade and the Graduate Institute of International Studies, 1971).

24. A more detailed analysis than provided here is available in J. Berlinski and D. M. Schydlowsky, "Incentives for Industrialization in Argentina," Occasional Paper, no. 1 (Boston: Boston University, Center for Latin American Development Studies, October 31, 1977).

25. Note that this equivalence does not hold when the producer is a foreign enterprise that remits profits abroad.

26. For an earlier use of this procedure see D. M. Schydlowsky, "Latin American Trade Policy in the 1970s: A Prospective Analysis," *Quarterly Journal of Economics*, vol. 86 (May 1972); Bela Balassa, "Comment," and D. M. Schydlowsky, "Reply," *Quarterly Journal of Economics*, vol. 88 (August 1974); D. M. Schydlowsky, "Price and Scale Obstacles to Export Expansion in LDCs, 1975," in *Economic Growth in Developing Countries: Material and Human Resources*, ed. Yohanan Ramati (New York: Praeger, 1975).

27. Econometric estimates of the response of nontraditional exports to variations in the exchange rate are given by David Felix in "Industrial Structure, Industrial Exporting and Economic Policy: An Analysis of Recent Argentine Experience," in *Fiscal Policy for Industrialization and Development in Latin*

America, ed. David T. Geithman (Gainesville: University Presses of Florida, 1974), pp. 4–5, who finds no significant positive elasticity for 18 out of 27 sectors, and by Eaton in "Effective Devaluation in Latin America," who finds an elasticity of 2.0 using the same data. Both these results greatly underestimate the response of exports to incentives. First, they take no account of threshold effects, whereby if the export rate is below the cost rate, no exports are forthcoming, but if it is above the cost rate, the supply is great. Second, only 4 out of 77 sectors had cost rates below the sales rate, so that the data have little information content for calculating export elasticities. Thus, for industrial exports, it is more appropriate to make the small-country assumption than to rely on the econometric estimates.

28. Unfortunately, the effects of the incentive system on the growth of individual sectors cannot be tested conclusively owing to lack of information on the periods during which production was domesticated, and on the incentives and growth rates during those periods. For ingenuous attempts at such measurement, see David Felix, "The Dilemma of Import Substitution—Argentina," in *Development Policy: Theory and Practice*, ed. G. F. Papanek (Cambridge, Mass.: Harvard University Press, 1968); and Esther Lee Koss, "Growth Rates and Effective Protection in Argentina," Boston College, Boston, Mass., 1975.

29. For a more extensive discussion, see Diamand, *Doctrinas Economicas, Desarrollo e Independencia*, especially Pt. I; and D. M. Schydlowsky, "International Trade Policy in the Economic Growth of Latin America," in *Trade and Investment Policies in the Americas*, ed. Stephen E. Guisinger (Dallas, Tex.: Southern Methodist University Press, 1972).

30. Daniel M. Schydlowsky, "Comment on 'Beyond Import Substitution: A Latin American Dilemma' by David Felix," in *Estrategias de Industrializacion para la Argentina*, ed. Brodersohn.

31. Instituto Nacional de Estadistica y Censos, as cited in Mallon and Sourrouille, *Economic Policy Making in a Conflict Society*, p. 27.

32. For a discussion of the appropriateness of this measure see Bela Balassa and D. M. Schydlowsky, "Effective Tariffs, Domestic Resource Cost of Foreign Exchange and the Equilibrium Exchange Rate," *Journal of Political Economy*, vol. 76 (May/June 1968); Michael Bruno, "Domestic Resource Cost and Effective Protection: Clarification and Synthesis," *Journal of Political Economy*, vol. 80 (January /February 1972); Bela Balassa and D. M. Schydlowsky, "Domestic Resource Cost and Effective Protection Once Again," *Journal of Political Economy*, vol. 80 (January/February, 1972). A comparison of direct and total domestic resource costs is available from the authors.

33. Herein we follow Harberger, UNIDO, and various others, rather than the OECD/World Bank approach, which uses investment or free government resources as the numeraire.

34. See D. M. Schydlowsky, "Project Evaluation in Economies in General Disequilibrium: An Application of Second-Best Analysis," Discussion Paper, no. 1 (Boston: Boston University, Center for Latin American Development Studies, March 1973; processed); and "Methodology for the Empirical Estimation of Shadow Prices," Discussion Paper, no. 2 (Boston: Boston University, Center for Latin American Development Studies, April 1973; processed).

35. For a detailed discussion of how labor market structures interact with the shadow pricing of labor, see D. M. Schydlowsky, "The Design of Benefit/Cost Analysis of Investment Projects in Peru: A Country-Specific View," *Industrialization and Development*, no. 2 (1978), secs. 1 and 3.

36. For a more precise analytical treatment and an algebraic formulation of the transformation of market to shadow prices, see Schydlowsky, "Project Evaluation in Economies in General Disequilibrium," secs. 2.3, 4.3, and 4.4, and "Methodology for the Empirical Estimation of Shadow Prices," sec. 6.

37. Another interpretation is that the Ricardian elements in comparative advantage dominate the Heckscher-Ohlin ones.

38. Note that only activities existing in 1969 are included in the ranking; other possible ones are not taken into account. On the problem this implies, see R. Findlay, "Comparative Advantage, Effective Protection and the Domestic Resource Cost of Foreign Exchange," *Journal of International Economics*, vol. 1 (May 1971).

39. CONADE tabulated figures on a two-digit sector basis starting in 1960; the series was continued after 1967 by the Ministry of the Economy.

40. Ministerio de Economia y Trabajo, *Direccion Nacional de Analysis de Coyuntura* (Buenos Aires: November 1970), tables 6 and 9.

41. One should nonetheless bear in mind the impossibility of attaining the level of capacity utilization desired by the entrepreneur over the business cycle, on the average. This target may not be reached even in boom times owing to factors such as machinery breakdowns, strikes, obsolete capacity, bottlenecks, and lack of correspondence of existing capacity to the pattern of demand.

42. See R. Betancourt and C. Clague, "An Econometric Analysis of Capital Utilization," University of Maryland, College Park, Md., 1975 (processed); P. Millan, "The Intensive Use of Capital in Industrial Plants: Multiple Shifts as an Economic Option," Ph.D. dissertation, Harvard University Department of Economics, Cambridge, Mass., 1975.

43. See, for example, Mallon and Sourrouille, *Economic Policy Making in a Conflict Society*.

44. Underemployment of labor would result from the excess of the entrepreneurs' cost of labor over the social opportunity cost. Underutilization of capital may be explained as follows: at distorted factor prices, the privately optimal number of shifts is less than the socially optimal number. This implies a higher ratio of capital *stock* to labor. With a given capital stock, less labor can therefore be employed. Additional capital services are, however, also available on the shifts that are socially but not privately profitable.

45. We wish to acknowledge especially our debt to Marcelo Diamand regarding this section. Discussions with him over the years have done much to shape our views.

46. Since the devaluation is offset on the import side, little import reduction will occur, other things being equal. The increased exports, however, will furnish the foreign exchange necessary to permit a higher rate of factor utilization and of growth.

47. The tax would have to be indexed to the crawling peg, so as not to be eroded by domestic inflation. The possibility of an optimal export tax on traditional exports might also be considered. To the extent that in the production of these exports, unlike most other products, imports are complements to and not substitutes for domestic production, such a tax is appropriate only if the demand elasticity is less than 1, which would make it applicable only to beef.

48. Such a policy would be desirable even if sales at marginal cost could take place without additional incentives, since it may take time to enter foreign markets. Infant export protection would thus be needed.

49. The industrial part of the package is equivalent to an outright increase in export subsidies, but without the com-

plications arising from GATT rules and countervailing duties in the importing countries.

50. For an analytical description of this kind of stabilization, see Jorge Cauas, "Short-Term Economic Policy," in *Development and Planning: Essays in Honor of Paul Rosenstein-Rodan*, ed. Jadgish Bhagwati and Richard Eckaus (Cambridge, Mass.: M.I.T. Press, 1973).

51. Another alternative is an urban food subsidy, but the administrative problems associated with an equitable scheme are considerable. Since the bottom of the income distribution is much less powerful politically than the middle, implementation of the domestic price policy may not be much hindered by the compensation problem.

52. The part of the new land tax that applies to exported output has the same yield as an export tax of the same percentage as the devaluation.

53. The fiscal balance would be improved to the extent that import duties are below the rate of devaluation.

54. The equivalence would be exact if the volume sold remained constant.

55. If the tax cuts and subsidies are properly distributed, this should take care of the low-income groups, too.

56. For a calculation, see D. M. Schydlowsky, "Short-Run Policy in Semi-industrialized Countries," Development Advisory Service Report, no. 73 (Cambridge, Mass.: Harvard University Center for International Affairs, 1967; processed).

57. Ibid., pp. 402–03.

58. Balassa and Schydlowsky, "Effective Tariffs, Domestic Resource Cost of Foreign Exchange and the Equilibrium Exchange Rate."

59. Bela Balassa and D. M. Schydlowsky, "Indicators of Protection and other Incentive Measures," in *The Role of the Computer in Economic and Social Research in Latin America*, ed. Nancy D. Ruggles (New York: National Bureau of Economic Research, 1974).

6

Colombia

THOMAS L. HUTCHESON AND DANIEL M. SCHYDLOWSKY

In 1970, with a population of more than 20 million, Colombia was the fourth largest Latin American nation. Although income per capita was US$340 in that year, it was low relative to incomes in the rest of Latin America, placing Colombia twentieth among Central and South American nations.[1]

Economic History

During the post–World War II period Colombia evolved from a predominantly rural, agricultural nation to one in which, by 1970, 60 percent of the population resided in urban areas and twenty-four cities had populations in excess of 100,000. Agriculture's share of GNP, at about 30 percent, still exceeded that of manufacturing, but it had declined substantially since World War II. Coffee remained the principal agricultural activity, accounting for about one fourth of agricultural production and more than half of export earnings.

Colombia is a nation of marked contrasts in terrain, climate, and other physical features, as well as in its economic and social development. Not the least of these contrasts is that among regions. Manufacturing and commercial activity and, to a lesser extent, income and wealth are highly concentrated in the triangle formed by the interior cities of Bogota, Cali, and Medellin. Income per capita in the departments in which these cities are located is roughly double the national average and more than four times that in the other departments.[2] The relatively high incomes and levels of economic activity in the more advanced regions, the persistence of rural disturbances through 1965, and the disproportionate share of public investment in physical and human capital in the urban areas attracted a great number of rural migrants to the larger cities. Interregional migration, together with an incentive system that furthered capital- rather than labor-intensive production in the industrial sector, contributed to steadily rising urban unemployment in the 1960s. Rates of open unemployment in excess of 12 percent were not uncommon in the four largest cities.[3]

Despite improvements in housing, education, health services, electricity, water, and telecommunications, a large proportion of the population seems to have benefited only slightly from the country's steady though unspectacular economic and social advances.[4] The distribution of before-tax income remained highly skewed, and little was changed by the operation of the fiscal system.[5] Primary education and basic health services were still largely inaccessible to the poorest segment of the population, particularly in rural areas and especially within the less developed regions.

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Colombia's development during much of the postwar period was representative of the typical import-substitution industrialization sequence.[6] Protection was used to spur industrialization as well as to decrease foreign dependence. The result was the replacement of dispensable imports by imports that were necessary to maintain domestic production, and an increasingly severe shortage of foreign exchange. There is broad recognition that in the 1950s and 1960s Colombia's growth was hampered by foreign exchange shortages, but there is less agreement on the extent to which the shortages were perpetuated by economic policy. The turnabout occurred in the late 1960s when policies began to emphasize outward-oriented industrialization.

Coffee Exports and Economic Expansion, 1950–57

In 1950 Colombia was still an agricultural economy. Agriculture employed 50 percent of the labor force, produced about 40 percent of total GNP, and earned most of the country's foreign exchange, primarily through exports of coffee, but also of tobacco and bananas. Manufacturing accounted for only about 15 percent of GNP and 6 percent of employment, even though it had grown rapidly in the two preceding decades. This expansion of manufacturing occurred largely in response to a gradual shift in the terms of trade against primary products, especially coffee, caused by changes in world market prices.

Coffee exports rose rapidly from US$104 million in 1945 to US$550 million in 1954. Real GNP grew at about 9 percent a year in 1945–50, but manufacturing grew little faster than the average, since rising foreign exchange earnings and the drawing down of reserves permitted imports to increase. Rising imports increasingly overtook high export earnings and provoked a revision of the tariff schedule that had been in force since 1931. The new tariff was protectionist, according to the minister of finance, who explained that its aims were to raise national income, to improve the "quality" of labor, and to "harmonize the interests" of manufacturing and agriculture.[7] The latter expression might have meant that protection was intended to favor industry without apparently harming agriculture. Of course, industrial protection would lower real incomes in agriculture in general and in the coffee sector in particular, but perhaps less visibly than would an outright increase in the coffee export tax.

The method chosen for promoting industry was to stimulate import substitution. No attention was given to stimulating industrial exports, and the protective tariffs in fact discriminated against exports. The new tariff schedule was less uniform than the 1931 schedule; final goods had high rates, while capital and intermediate goods had low rates. A list of prohibited imports was also adopted.[8]

Industrial growth in Colombia continued at an average annual rate of 7 percent after the introduction of protective measures, but it became increasingly dependent on high foreign exchange earnings to sustain it. The National Association of Industrialists observed in 1970: "It should be pointed out that this stage [the 1950s] was marked by an industrialization strongly dependent on imported inputs, a characteristic which our industry has not yet completely escaped."[9] As examples, one could point to the growth of metal products, rubber products, and chemicals; all were and still are highly demanding of foreign exchange.

With the expansion of import-intensive industries, economic stability depended on a continuous rise in export earnings. Domestic inflation, however, eroded the real exchange rate (that is, the nominal exchange rate adjusted for changes in domestic prices), and thereby discouraged nontraditional exports and reduced the incentive to replace imports with domestically produced inputs. In partial compensation, from August 1952 to May 1955 producers of certain nontraditional exports were given export vouchers that entitled them to import items on the prohibited list.

Coffee revenues began to drop in 1955, but the government allowed a large short-term debt to accumulate in order to maintain imports at a high level through 1956. In 1957 mounting political and economic pressures toppled the Rojas government, a semipopulist dictatorship, after four years in power. The provisional government devalued sharply and imposed tight exchange controls that temporarily halted almost all imports. Colombia had experienced its first modern foreign exchange crisis.

The Policy of Import Substitution, 1957–67

After the crisis the new government—the National Front Coalition between the traditional liberal and conservative parties—set up an import licensing agency, SUPERCOMEX (later renamed INCOMEX, Instituto Colombiano de Comercio Exterior). Economic growth continued, but at no more than 4 percent a year. Inflation also continued and steadily reduced the real exchange rate between 1957 and 1967.

The National Front government revised the tariff system in 1959.[10] It was held that continued import substitution was desirable and that this should entail eliminating imports of consumer goods and replacing imports of intermediate goods by domestic production. Imports of capital goods by the manufacturing sector were to be restricted to those necessary to manufacture goods previously imported. Capital and intermediate

goods for agriculture could, however, continue to be imported rather freely and at low tariffs. The tariffs based on this reasoning were higher and even less uniform than the tariffs of 1950.[11]

Multiple exchange rates were in effect during the first two years of the new government and exporters of nontraditional products were allowed to sell their foreign exchange at the floating free rate. And while nontraditional exports were subject to general export taxes, these were imposed at a lower rate. Furthermore, the maximum permissible import content of nontraditional exports using the free rate was raised from 40 to 50 percent.

After 1961, nontraditional exports also benefited from an income tax exemption that allowed the deduction of up to 40 percent of the gross value of exports from taxable profits. At an average income tax rate of 36 percent, this implied a subsidy of 14.4 percent on the gross value of exports. Finally, this period saw the creation of Plan Vallejo (1959), which permitted imports of certain industrial inputs needed in export production.

In 1962 a fall in coffee earnings brought about another exchange crisis that led to a sizable devaluation. But an easy monetary policy and a legislated increase in wages again led to price increases, so that by mid-1963 the real exchange rate was back at the 1961 level. A tariff reform in 1962, ostensibly based on technical considerations, reinforced the emphasis on import substitution. Tariffs on intermediate goods not already produced in the country were reduced; tariffs on final goods were raised. The result was a further increase in the dispersion of tariff rates.[12]

Import restrictions were tightened in 1964 and 1965 as the real exchange rate declined further. In 1965 a further devaluation, caused by another drop in coffee prices, raised the real exchange rate above 1963–64 levels. Nontraditional exports obtained a pegged rate of Col$10 (pesos) to the U.S. dollar from January 1963 to October 1964, when the rate was again freed. The rate reached a peak of almost Col$19 in June 1965, when it was pegged at Col$13.50 until the major reform of 1967.

The severity of the foreign exchange shortage that had been developing since the 1950s was dramatically revealed when the government attempted to liberalize imports in 1966. It was assumed that restrictions could be reduced to approximately their 1962 level, and that this could be accomplished at the existing exchange rate, which was about 12 percent higher than in 1962 (see the section "Incentives and Economic Performance" below). But the government apparently failed to take into account such structural changes as the continuing fall in coffee revenues in relation to GNP, and the increased dependence of the economy on imports. Moreover, exchange reserves were too low to accommodate the pent-up demand for imports after years of scarcity, and the speculative demand from importers who foresaw that the liberalization attempt would fail. The result was a surge of imports, and net foreign exchange reserves became negative by November. This time, however, the reaction was a turn outward.

Reorientation of Incentives, 1967–70

In 1967, 25 percent of the urban labor force was unemployed.[13] Such high unemployment tends to undermine the bargaining power of workers and depress wages. Real wages for manual and for white-collar workers increased by only 2.3 and 0.4 percent a year, respectively, between 1962 and 1967.

Perhaps the most important measure taken in 1967 concerned the exchange rate. Decree 444 provided for a crawling peg with day-to-day movements controlled by the central bank, the Banco de la Republica, while the longer term trend was to be set by the "economic cabinet," consisting of the president and the most important ministers. The strategy was to raise the nominal rate gradually, somewhat faster than the difference between Colombian and international rates of inflation. Separate exchange rates for coffee and for portfolio capital and foreign direct investment were consolidated into the new crawling peg, and a tax was levied on coffee exporters to eliminate windfall profits.[14] Increases in the real exchange rate had beneficial effects on business confidence as well as on exports. Fears of another exchange crisis gradually disappeared, and exporters were able to plan on a more stable relationship between costs and export prices.

Another important reform measure was the replacement of a tax deduction for exporters with a straight subsidy. The exporter received an amount equivalent to 15 percent of f.o.b. export value in the form of a tax-free certificate, or CAT (Certificado de Abono Tributario), which could be used to pay taxes one year after the date of issue. The rate of the CAT approximately equaled the tax deduction it replaced, but it had several advantages: its effective value was more nearly equal among different exporters than that of the tax deduction; it was more visible and did not require discretionary action, which would have given rise to selectivity; and, since it was transferable among firms, its benefits could be used even if the firm to which it was issued did not make sufficient profits.

A third reform measure was to breathe new life into Plan Vallejo, which had become almost defunct. Under this plan an exporter signed a contract with INCOMEX whereby he agreed to export a certain quantity of goods in return for permission to import the intermediate goods used in export production, free of import duties, import licenses, and requirements for advance deposits.

Administrative obstacles to Plan Vallejo were removed and the process of signing contracts was speeded up.

Fourth, an export promotion agency, PROEXPO, was set up. Its activities included holding trade fairs, financing exports, advertising the desirability of exporting, undertaking market investigations, and so on. The effectiveness of PROEXPO's activities has been questioned,[15] but its very creation was indicative of a change in policy.

Following the adoption of the reform measures, the real exchange rate rose in 1967 and 1968—the first two consecutive rises since 1957–58 when the free rate was in effect. The real rate rose further in 1969 and, in conjunction with the new export incentives, exports increased rapidly; the result was an acceleration of economic growth. Exports other than coffee and petroleum doubled within three years. Foreign exchange reserves also increased, and Colombia suddenly acquired a reputation among international lenders as a well-managed economy.

Several factors contributed to the rapid rise of nontraditional exports. First, the increase in the real exchange rate, the CAT, the reform in Plan Vallejo, and PROEXPO all made exports more profitable. Second, adoption of the crawling peg reduced the foreign exchange risk to the exporter. Third, there was a large amount of excess capacity in 1967, in part created by the exchange crisis, which allowed firms to respond rapidly to the new measures. Fourth, both the government and the private sector seemed to have become conscious of the need to acquire foreign exchange through exports. For the first time, the solution to the foreign exchange problem was sought in an increase in exports, not a reduction in imports.

Inflation and Recession, 1970–77

After 1970, however, inflation accelerated. Although the inflationary conditions abroad no doubt played a role, domestic inflation at 23 percent a year between 1970 and 1974 exceeded foreign inflation by a considerable margin. Domestic inflation was probably related to the decline in the net inflow of foreign savings associated with the improving trade balance and to a fall in public sector savings in relation to GDP. Private savings increased somewhat but not enough to compensate for the other two items. Thus, by 1974 the need for domestic savings had become more pressing.

The new government that took office in 1974 accepted the need for additional savings. It enacted a tax reform designed to increase public sector savings as well as far-reaching financial reforms to mobilize private savings. The government also speeded up the liberalization of the import control system and reduced the CAT, intending to replace it with a higher real exchange rate. At the same time, the world recession had unfavorable effects on the Colombian economy, leading to a slowdown in economic growth.

The boom in coffee prices that began in 1975 complicated matters further. Politically, it had always been difficult to tax the coffee sector, and 1975 was no exception. The large increases in incomes from higher prices went almost entirely to the coffee-producing sector. At the same time, in spite of efforts made to sterilize the inflow, the central bank had to allow a significant portion of the large increase in international reserves to increase the domestic monetary base.

By mid-1977 inflation had reached a historic high of over 40 percent a year, while economic growth had recovered only modestly, to about 6 percent a year. Under the circumstances, the government concentrated chiefly on attempting to control aggregate demand. Public investment was cut back, and bank credit was tightened to hold down private expenditures. To reduce the current account surplus and slow down the inflationary accumulation of foreign exchange reserves, tariffs were reduced, import licensing was virtually abolished, and the depreciation of the peso almost halted.[16] As a result of the fall in the real exchange rate and the reduction in the CAT, incentives to nontraditional exports decreased greatly and led to a slowdown in the growth of manufactured exports.

Components of the Incentive System, 1969

Nominal Protection on Imports

In 1969 Colombia used three main policy tools to restrict imports: import licensing, tariffs, and advance deposits on imports. Import licensing had a much greater effect on imports and on domestic production than the other two policy tools. The tariff system differentiated between most-favored-nation tariffs and those applying to imports from partner countries of the Latin American Free Trade Association. The Andean Integration Agreement has just been signed and had not yet affected the tariffs applied. The tariff structure had a high degree of dispersion. High and generally prohibitive tariffs applied to fairly simple goods, such as textiles and food products; consumer durables were also subject to high tariffs, while intermediate goods and capital goods had relatively low tariffs. The advance deposits for imports had only a minor effect on trade and production but a more important role as a tool of monetary policy designed to absorb excess liquidity.

The licensing system was by far the most important protectionist tool. Growing out of the severe balance of payments crises of the late 1950s and early 1960s, the

principles underlying import controls were that Colombia should not import more than it was able to pay for and should not import things that it could produce domestically. The latter principle implied an import-substitution policy "at any cost," although this was somewhat tempered in its administration (imports of competing products were occasionally allowed when the price of the domestic product was seen to have become too high). The practical effect of this philosophy of import control was to insulate domestic prices from the world market and thus to render much of Colombian output noncompetitive with imports.

The import licensing system grouped all potential imports into a prohibited list, a prior license list, and a free list. The prohibited list included all items that could not be imported under any circumstances, whereas the free list included products for which no licenses would be required. In 1969, 90 percent of Colombia's imports were of products that required a prior license.

The tightness of the controls has been measured in a variety of ways.[17] The only effective way, however, appears to be to determine the scarcity premium attached to the licenses, by calculating their implicit tariff equivalent. Such measurement is made difficult by another aspect of the licensing system, namely, the preference for allocating imports directly to users. Thus, approximately two thirds of all import licenses were granted to industrial users for "industrial imports" while the remainder were granted to "commercial" users. Furthermore, the resale of imports brought in under license by industrial users might have prejudiced their future allocations. Although INCOMEX regarded swaps and loans of raw materials as sensible ways of solving temporary shortages, it saw systematic sales of imported raw materials as implying a misstatement of requirements designed to capture extremely large shares of a scarce resource.[18]

The effective removal of two thirds of imports from the domestic market severely limits the availability of information that is necessary to calculate the implicit scarcity premium attached to these imports. In addition, the relatively small volume of trade between commercial importers and the smaller manufacturers who did not import directly means that the prices applying to this trade may not be representative of real values.

The interaction between the tariff system and import licensing was far from simple. On some high-tariff items, including some textiles and food products, domestic competition was sufficient to reduce prices to close to the c.i.f. import price. The case of consumer durables was quite the reverse; there, import licensing further raised the protection accorded by high tariffs. Finally, goods were usually subject only to low tariffs until they began to be produced domestically; at that time, quantitative restrictions would typically be introduced.

The advance deposits required for imports made a minor contribution to the import control system. Importers were obliged to deposit between 1 and 130 percent of the f.o.b. value of imports before applying for import registration and licenses. In 1969 these funds were retained by the Banco de la Republica for approximately ninety days after the imported merchandise had cleared customs. This implied a full deposit period of approximately ten months (two months from application for license approval, five months from approval through arrival and clearance of customs, plus three months' retention by the Banco de la Republica).

In 1969 the total amount of import deposits held by the Banco de la Republica was approximately Col$1,200 million. At the bank lending rate of 18 percent for ten months, the aggregate cost to importers was Col$179 million. The total dutiable imports in 1969 were Col$9,070 million, so that the cost of the deposits was equivalent to a 2 percent tariff, on the average.

Obviously, the cost of advance deposits to the importer of a particular item might be much higher. For an item on which 130 percent of the value needed to be predeposited, for example, the cost to the importer would have been equivalent to a 20 percent tariff.[19] Further, advance deposits for imports had a substantial effect on the economy at large, through the absorption of substantial amounts of liquidity by the central bank.

Price Comparisons

In view of the incentive system applied, the prices of domestic products and imports had to be compared in order to calculate the nominal rates of protection. Several factors made such price comparisons difficult. Since import licenses were allocated directly to users, there were no domestic prices for many of the commodities imported. Also, since the import restrictions were administered to keep out competitive imports, it was often difficult to find a matching import price for domestically manufactured output.

Approximately one third of the price comparisons were obtained as part of an inventory of export possibilities carried out by PROEXPO, the export promotion agency; the producers in question were asked for information on their export price and their domestic price for each article imported or offered for export. Another third of the comparisons were obtained by a mail survey of importers and exporters conducted by the National Planning Agency of the Colombian government and one of the authors. Exporters were asked the same question as that posed by PROEXPO; importers were asked the c.i.f. price and the local resale price. The response was good

from exporters but poor from importers. There are two probable reasons for this. Since few imports were resold, importers had no way of knowing their resale value. Second, when resales did take place, importers may have been reluctant to disclose the premium that they collected because they recognized it to be a monopoly rent, and because they were aware that INCOMEX frowned on resales.

The remaining price comparisons were obtained by one of the authors in personal interviews. Introductions were made by the National Association of Industrialists to a responsible executive of each company surveyed. In these interviews it was generally possible to determine the import prices of the goods being produced. Additional data on ratios of domestic prices to f.o.b. prices, supplemented by information on international shipping costs, made it possible to calculate the prices of potential imports.

After some screening, 317 of the 505 comparisons obtained were used. Of the 317, 183 were export price comparisons and the remaining 130, import price comparisons. Of the 96 sectors of traded goods in the 1969 input-output table, all but 13 are represented by at least one price comparison, while 48 sectors are represented by five or more comparisons. For some 50 percent of manufacturing output, price information is available for five or more products in each sector; for the remaining 13 percent of manufacturing output, the price ratios obtained for similar commodities were used.

Our estimates of price ratios are biased in several directions. The large number of c.i.f. prices estimated from f.o.b. prices tends to bias the estimates downward. The main reason for this bias is that the most competitive products are exported, and these were naturally the ones with costs closest to world market prices. Thus high-cost products, particularly in low-cost sectors, tend not to be observed. As a result, although we made a special effort to sample sectors that were known to produce high-cost items, our protection estimates are likely to be biased downward. Another possible source of downward bias is the underestimation of differences in quality. Our informants may have portrayed their own products as equivalent to imported ones when in fact they were not, although in some cases Colombian products might have been more suitable for Colombian conditions. The estimates of nominal protection resulting from the price comparisons for individual products have been averaged for each sector by means of domestically priced production weights. This produces a slight upward bias at the sectoral level, which may provide some additional compensation for the downward biases at the product level.

The sectoral averages are indicators of the nominal protection afforded to domestic output for sale on the domestic market and of protection to domestically produced inputs. Exports of domestic products were affected by the export incentive scheme, to be discussed in the next section, and most inputs imported from abroad were not subject to the same scarcity premiums as domestically produced inputs, which were allocated directly to users via the import licensing system. Unfortunately, no information is available at the sectoral level on the breakdown of imported commodities between directly allocated imports and imports bought from commercial importers. Nor was it possible to determine accurately the breakdown of imported inputs among the user sectors. As a result, we were not able to calculate a properly weighted average of protection for imported inputs on a sectoral basis. Without this, it was assumed that the realized imports of all sectors paid the average import tariff. This amount was calculated by taking into consideration the 1969 tariff collections, including a 3 percent surcharge earmarked for PROEXPO and adjusted for duty-free imports by government agencies and diplomats, or imported using long-term international credits and hence not dutiable. The resulting average tariff rate is 20 percent, to which was added the 2 percent equivalent tariff of the advance deposits for imports, to obtain a figure of 22 percent.

Using a uniform nominal rate of protection for imported inputs, instead of a more appropriate sectorally weighted rate, has a twofold effect. First, the effective rates of protection will be less dispersed, since any contribution to the variance of the effective rates owing to differences in protection on the imported inputs is eliminated. Second, effective rates of protection tend to be overstated since it is assumed that all inputs are allocated directly to the final users, and hence the costs of inputs purchased from commercial importers are understated.

Nominal Protection on Exports

Colombia's exports in 1969 can be classified into major exports and minor exports. Major exports were coffee, petroleum, and raw hides, which together made up 66 percent of total exports. All others are treated as minor exports. In general, major exports were taxed in order to reduce the peso equivalent obtained per dollar of f.o.b. value exported, while minor exports received subsidies, which raised the peso return per dollar exported.

The taxation of coffee corresponded to Colombia's membership in the International Coffee Agreement, which limits exports. To reduce the incentives to plant coffee and to raise funds for the diversification of coffee land, coffee exports were subject to a 20 percent export tax. In addition, there was a coffee retention quota of 20

to 25 percent in 1969, designed mainly to keep inferior coffee out of the export market, and a tax of 6 percent paid by producers to the Colombian Coffee Federation.

In 1969 the government acted further to prevent additional plantings from being stimulated by the high international prices of that year. Coffee growers were to receive only 35 percent of any price increases beyond Col$1,300 per *carga* (truckload); 30 percent was to go to the national coffee fund and 35 percent to departmental coffee committees and a rotating fund administered by the Banco Cafetero. Finally, the monetary board determined the exchange surrender requirement per bag of coffee, and in this manner fixed the amount of foreign currency that growers were obliged to exchange for pesos. This amount was set above the prevailing f.o.b. market price, so that the effective tax paid by exporters was higher than the nominal 20 percent. For our calculations we determined the aggregate effect of this regime by comparing domestic and f.o.b. prices for coffee and using the difference, 50.6 percent, as the nominal export tax.

Petroleum policy in 1969 was determined by the desire to keep the price of gasoline low. A special exchange rate of Col$13.50 to the U.S. dollar was applied in setting the price of petroleum produced domestically for domestic use, as compared with the annual average of official rates of Col$17.52, which applied to the foreign exchange earned from petroleum exports. Petroleum exports were not subject to income tax. Nonetheless, the expected return to new exploration and drilling was reduced, because new output would be sold in part on the domestic market.

Mini exports were promoted by three different types of measures: the CAT, the Plan Vallejo, and two alternative export financing schemes. The first two systems have been briefly described above.

Since the CAT was freely negotiable and could be used for the payment of any tax after one year from the date of issue, its actual value to the recipient thus depended on the discount at which it was traded and reflected the opportunity cost of funds as valued by the market. This discount rate was 17 percent in 1969, and thus the present value of the CAT received against one dollar's worth of exports was 13 percent. Since CAT revenues were not liable to tax, the present value of their taxable equivalent was, however, higher than this figure.

We assumed that only corporations (*sociedades anonimas*) and joint stock companies (*sociedades limitades*) exported. The marginal tax rates of these companies in 1969 were 36 and 24 percent, respectively. Lacking information on the distribution of exports between these types of companies, we have taken 30 percent as the marginal tax rate of all exporters. This assumption implies that the total value of the CAT to the exporters was 18 percent (13 percent/1 -0.3). Hence the tax system is considered to have given an additional 5 percent incentive to exporters.[20]

In our calculations, we have assumed that all sectors eligible under the Plan Vallejo imported free of duty, license, and advance deposits for imports. This assumption is reflected in the rate of protection on imported inputs for exports. Plan Vallejo exports may well have been more import intensive than production at large, but the analysis does not take account of this possibility. In other words, the assumption of a single production function for each input or output column has been maintained. This results in an underestimation of protection to exports.

Export financing was available through two channels. First, PROEXPO arranged loans at preferential rates, though in amounts so small as to make no significant impact; and second, under the so-called advance exchange surrender system exporters would borrow abroad against their export contracts, surrender the resulting foreign exchange to the central bank, and eventually repay the loan from their export proceeds. The net result was to give Colombian exporters access to the foreign interest rate, which was lower than the domestic rate. No exchange risk was involved. We have computed the interest subsidy implicit in the system of export financing in 1969 by comparing the London eurodollar rate (9.9 percent) with the domestic norm interest rate (14.5 percent), which yields a differential of 4.6 percent. Of this, 1.5 percent was a commission charge, and 3.1 percent, the net differential. More than half the exports used this system in 1969 (56.2 percent) so that the average credit subsidy to exports in Colombia was about 1.7 percent. Exporters paid no tax on the proceeds from this system. Applying the assumed marginal tax rate of 30 percent yields a total credit subsidy for exports of 2.4 percent.

Our estimates of nominal protection cover only the direct 13 percent of CAT benefit as protection to exports. The Plan Vallejo features are taken into account in the calculations of effective protection, and the effects of the tax and credit measures that supplemented these instruments are shown in the effective subsidy calculation.

The Structure of Nominal Protection by Industry Group and Trade Category

Tables 6.1 and 6.2 show that protection rates varied on sales in the domestic market, but that all sales for export—with the exception of coffee and petroleum—received the CAT rate of 13 percent.

Table 6.1. *Colombia: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Two-digit Industry, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Coffee	-51	-51	-51	-51	-51	-51	-50	-70	-70	-70	-49	-49	-49	-49	-69	-69	-69
Noncoffee Agriculture	13	2	2	-15	1	2	2	-11	-26	-25	26	3	4	4	2	-24	-23
Hunting and Fishing	13	30	26	10	30	25	25	-17	2	-3	19	27	25	25	-8	0	-2
Forestry	13	0	0	15	0	0	0	-12	-27	-27	23	0	1	1	-2	-27	-26
Mining	0	-11	-9	1	-12	-10	-9	-26	-40	-38	-1	-14	-12	-11	-30	-43	-40
Food Products	13	0	3	68	-2	12	8	31	-29	-15	88	-9	10	7	44	-36	-18
Beverages	13	51	51	1	51	51	42	-26	-16	16	2	43	43	35	-23	9	9
Tobacco	13	0	0	19	0	0	0	-10	-27	-27	29	-1	-1	-1	-1	-27	-27
Textiles	13	22	21	-2	17	17	12	-29	-2	-4	12	15	15	11	-16	-9	-9
Clothing	13	17	17	39	18	18	13	80	-4	-4	60	17	17	12	119	-7	-7
Wood Products	13	8	9	23	7	11	7	18	-16	-9	44	-1	9	5	51	-3	-17
Furniture	13	8	8	23	8	8	5	108	4	5	41	5	5	3	166	-30	-29
Paper Products	13	22	21	-2	24	23	12	-17[a]	239	354	33	20	20	11	-80	83	111
Leather Products	13	21	20	-4	22	18	13	953[a]	634	617	19	17	17	12	314	111	1
Rubber Products	13	12	12	1	8	8	7	-29[a]	-18	-18	13	7	7	6	-9	-20	-20
Chemical Products	13	50	49	-21	63	60	40	106[a]	-522[a]	-480[a]	-12	58	55	37	43[a]	-664[a]	-603[a]
Refinery Products	13	-12	-8	108	-12	9	6	79	-38	-18	140	-19	8	5	101	-46	-21
Nonmetallic Minerals	13	4	4	23	2	4	3	-1	-26	-23	32	-5	-2	-2	9	-36	-32
Basic Metals	13	33	33	-586	203	180	11	147[a]	-49[a]	-47[a]	-409[a]	118	102	7	156[a]	-41[a]	-39[a]
Metal Products	13	26	26	1	29	28	21	-26	23	21	14	25	25	18	-8	12	12
Nonelectrical Machinery	13	28	27	1	35	32	21	-539[a]	73	80	3	17	16	10	-15	14	11
Electrical Machinery	13	84	83	-215	248	241	78	-915	-198[a]	-195	-220	196	189	61	255[a]	-214[a]	-209[a]
Transport Equipment	13	139	139	-87	215	215	135	737[a]	-1,328[a]	-1,328 [a]	-68	215	215	136	774[a]	-1,570[a]	-1,570 [a]
Miscellaneous Industries	13	62	50	-42	72	67	47	-151	104	96	-25	69	64	45	-94	87	80

a/ Negative cash flow at free trade prices.

PROTECTION ON DOMESTIC SALES AND ON EXPORTS. At an overall average of 5.1 percent, Colombian import protection in 1969 appears to have been quite low. Even when coffee, mining, and sugar are excluded, the total average protection was only 12.5 percent. Manufacturing by itself had an average nominal protection rate of just over 20 percent (Table 6.2).

Of the ten industry groups, transport equipment had the highest nominal protection rate at 139 percent. Durable consumer goods were a distant second with 50 percent. Agriculture other than coffee, combined with forestry and fishing, had very low protection at under 2 percent. The rates on processed foods and construction materials were close to zero and less than 4 percent, respectively. Intermediate products I followed with 11 percent, while beverages and tobacco and intermediate products II followed at 23 and 27 percent, and average nominal rates for nondurable consumer goods and machinery ranged from 34 to 37 percent.

Examination of nominal rates of protection grouped by the four trade categories yields some other interesting insights (Table 6.3). Sales by export industries on the domestic market, whether of primary or manufactured goods, were generally taxed, whereas export-and-import-competing (XIC) industries enjoyed protection on their domestic sales (31 percent) exceeding that of non-import-competing industries (16 percent for manufacturing and 2 percent for primary products). Finally, import-competing manufacturing received the highest protection at 38 percent.

These data suggest that the quantitative controls on imports did not generate very high prices in sectors that competed with imports. The fact that the domestic prices of the products sold domestically by these sectors were only 16 percent higher than their world prices points to the existence of domestic competition.[21] The data also imply that the import-substituting industries that were still competing with imports had higher prices than older, more established ones.

NOMINAL PROTECTION OF DOMESTIC SALES VERSUS EXPORTS. A comparison of nominal protection on domestic sales and on exports shows several instances in which protection for exports was higher. Table 6.1 indicates that agriculture other than coffee received significantly higher protection on exports than on domestic sales, as did processed foods (with and without sugar) and construction materials. For intermediate products I, the indicators are close, but there is a slight edge for exports. For the remaining primary products, however, the 13 percent export subsidy was lower than the respective domestic nominal rates, which lay between 23 and 139 percent. This result also holds for manufacturing taken as a whole, as well as for all industries taken together.

The two-digit industry breakdown (Table 6.1) shows that in 13 out of 24 industries tabulated, the import protection rate was higher than the export protection rate, and in one other it was rather close. Furthermore, the averages for industries classified by trade orientation (Table 6.3) show that in export industries, manufactured exports received more protection than sales in the domestic market, whereas non-import-competing manufacturers received almost as much protection in export markets as they did in domestic ones. The domestic sales of export-and-import-competing industries and also of import-competing industries received protection much above the corresponding export subsidies.

Business Taxation

Colombia has relied more heavily than other Latin American nations on income and wealth taxes and on direct taxes in general.[22] The most characteristic feature of the Colombian business taxation system is its differentiation of the rates and regulations according to the legal form of the tax subject. In 1969 corporations (sociedades anonimas) were taxed at a rate progressing from 12 percent of taxable income of up to Col$100,000 pesos to 36 percent on the excess over Col$1 million, and dividends were taxed again as the personal income of the recipients. Limited liability companies (sociedades limitades) were taxed from 4 percent on the first Col$100,000 to 12 percent on the excess over Col$300,000, and the after-tax income of these companies was imputed to the owners to be taxed at the individual level. Both corporations and limited liability companies paid a special development and special social security tax of 3 percent. Partnerships paid rates ranging from 3 percent on the first Col$100,000 to 6 percent of the excess over Col$100,000, and were taxed again on their after-tax profits at the individual level. The result of this system was that different firms paid different amounts of tax, even when business and personal income taxes are considered together. As a result, the "conditions of competition" among the different forms of legal organizations were not neutral.[23] In addition to the business tax, corporations were subject to an excess profits tax, which was levied on after-tax income in excess of 12 percent of their net worth when the net worth was more than Col$200,000, at graduated rates that ranged from 20 to 56 percent. This tax further augmented the inequality in taxation among the different forms of enterprise.[24]

The structure of business taxation would be irrelevant to sectoral development if one could assume that particu-

Table 6.2. *Colombia: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added			
				Balassa			Corden
	E	D	A	E	D	A	A
Agriculture, Forestry and Fishing (I)	-35	-9	-12	-36	-10	-14	-18
Noncoffee Agriculture, Forestry, Fishing	13	2	2	15	2	2	2
Mining (IV)	13	-11	-9	1	-12	-10	-9
Primary Activities (I & IV)	-26	-9	-12	-33	-10	-14	-13
Processed Foods (II)	13	0	3	68	-2	12	8
Processed Foods less Sugar	13	2	4	80	3	19	12
Beverages and Tobacco (III)	13	23	23	7	24	24	20
Construction Materials (V)	13	4	5	24	3	5	3
Intermediate Products I (VI A)	13	11	11	41	14	19	12
Intermediate Products II (VI B)	13	27	26	-16	28	27	18
Nondurable Consumer Goods (VII)	13	37	37	-23	47	45	31
Consumer Durables (VIII)	13	50	49	-206	80	78	37
Machinery (IX)	13	34	33	-2	43	40	25
Transport Equipment(X)	13	139	139	-87	215	215	13
Manufacturing (II, III, V-X)	13	20	20	50	25	27	19
Manufacturing less Beverages and Tobacco (II, V-X)	13	20	19	50	25	27	19
Manufacturing less Sugar	13	22	21	54	27	30	20
All Industries less Coffee, Mining, Sugar	13	13	13	33	11	12	10
All Industries (I-X)	-15	5	3	-18	0	-2	-2

a/ Negative cash flow at free-trade prices.

lar forms of organization were just as appropriate for one sort of production as for another. But if in some sectors the smaller enterprise has an organizational advantage, and in others the corporate form is essential for sound management, the differentiation of tax rates by form of organization means that the tax system has different effects on various sectors of economic activity.

These effects are difficult to estimate because there are no statistics showing the tax liability either of different types of entities or of all types of entities broken down by type of industrial activity. Estimation of sectoral tax incidence is further complicated by the substantial differences between the tax liability declared by the taxpayer, the amount assessed by the government, and the

Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
			Balassa			Corden			
E	D	A	E	D	A	A	E	D	A
-59	-38	-41	-32	-9	-12	-16	-57	-36	-40
-11	-26	-25	25	3	4	4	0	-24	22
-26	-40	-38	-1	-14	-12	-11	-30	-42	-40
-56	-38	-41	-30	-9	-12	-12	-55	-36	-39
31	-29	-15	88	-9	10	7	44	-36	-18
40	-24	-9	104	-6	16	11	54	-33	-13
-20	-6	-6	12	20	20	17	-16	-9	-9
7	-24	-22	36	-4	-1	-1	17	-34	-31
21	-10	-4	63	7	17	11	41	-21	-9
165[a]	38	38	3	24	24	16	-29	21	20
-2,420	120	117	-12	43	42	28	-1,554	91	89
-433	-242[a]	236[a]	-200	63	61	28	140[a]	-303[a]	-284[a]
-433[a]	171	179	1	24	22	14	-19	69	51
737[a]	-1,328[a]	-1,328[a]	-69	215	215	136	774[a]	-1,570[a]	-1,570[a]
25	10	12	69	19	24	16	40	-1	4
25	14	15	69	19	24	16	40	1	6
31	15	17	74	22	26	18	47	3	8
9	-15	-14	48	10	12	10	23	-16	-13
-44	-27	-30	-12	-1	-2	-2	-39	-28	-30

amount finally paid. Typically, the taxpayer's initial declaration of taxable income is reviewed and amended at the national tax office. The counterproposal made by the tax authorities always states a higher tax base and may sometimes overstate it. After a lengthy process of litigation, agreement is reached on the amount to be paid, but in the interim, collections are based on the original declaration. This means that part of the taxes are paid with a time lag of up to five years, depending upon the size of the backlog of contested returns and upon the complexity and length of the judicial proceedings.

For practical purposes, the only sectoral data available correspond to the tax jurisdiction of Bogota for 1967. These data cover juridical entities (corporations and lim-

Table 6.3. *Colombia: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Export Industries	-34	-28	-30	-38	-34	-35	-33	-61	-58	-59	-36	-34	-35	-33	-59	-59	-59
Primary	-44	-37	-40	-45	-39	-41	-40	-66	-62	-63	-43	-38	-40	-39	-66	-61	-63
Manufacturing	13	-5	-1	35	-6	2	2	10	-34	-15	51	-12	1	1	24	-40	-26
Export-and-Import-Competing Industries	13	31	30	3	57	45	12	-1	-50	-54	10	25	21	6	-14	-42	-46
Manufacturing	13	31	30	3	57	45	12	-1	-50	-54	10	25	21	6	-14	-42	-46
Import-Competing Industries	13	38	37	-17	55	53	34	-814	229	224	-1	49	48	31	-75	157	155
Manufacturing	13	38	37	-17	55	53	34	-814	229	224	-1	49	48	31	-75	157	155
Non-Import-Competing Industries	13	7	8	36	6	7	6	1	-21	-19	51	5	8	7	23	-21	-18
Primary	13	2	2	15	1	2	2	+11	-26	-25	26	3	4	4	0	-24	-23
Manufacturing	13	16	15	70	18	22	16	37	-6	-1	91	13	19	13	51	-13	-6
All Industries	-15	5	3	-18	0	-2	-2	-44	-27	-30	-12	-1	-2	-2	-39	-28	30
Primary	-32	-9	-12	-33	-10	-14	-13	-57	-38	-41	-30	-9	-12	-12	-55	-36	-39
Manufacturing	13	20	20	50	25	27	19	25	10	12	69	19	24	16	40	-1	4

ited liability companies) and individuals. To arrive at total business taxation, it is necessary to add to the taxation of juridical entities some part of the taxes levied on individuals. Lacking more precise data, we assumed that 25 percent of the personal income tax accruing from sectors other than agriculture should be considered business income and that 50 percent of the personal income taxes collected from the agricultural sector should be considered business taxation. We then projected the resulting total to the national economy level, using the sectoral ratios of value added in Bogota to value added in the country as a whole. Finally, we adjusted the absolute amounts to ensure correspondence with the total taxation in 1969. The resulting tax coefficients for each sector were then reviewed by experts on the Colombian tax system. While no absurd results were found, some relevant caveats must be noted.

First, errors are introduced by the procedure for aggregating personal income taxes and business taxation, since the proportion of personal income taxation that corresponds to the business source may be expected to vary by industry. Furthermore, it would be more appropriate to aggregate the tax base rather than tax payments, since tax payments at the individual level may be reduced by exemptions or deductions not connected with the business activity. Additional biases are introduced by the projection of Bogota returns to Colombia as a whole, because Bogota has a disproportionate number of large enterprises and industrial activities.

One may guess at the direction of some of these biases but not others. Larger firms, for example, may pay higher taxes on a given amount of income, given their more systematic accounts and records. (The larger the firm, the greater is the *internal* need for accurate accounts, and thus the greater the potential accessibility of the tax base to the tax administration.) The implication is that Bogota tax ratios are overestimates for the country as a whole. Tax evasion is also more likely to occur outside Bogota than within, because tax administration machinery is concentrated in Bogota. This will tend to produce an overestimate of tax incidence and total collections. Further, evasion is likely to be greater among agricultural enterprises, whose tax base is less accessible to the tax administration than that of industrial ones. Offsetting these effects to some extent are the following considerations: the tax administration machinery may not take full advantage of the more complete record keeping of large companies; large firms are better able to litigate and delay tax payments; and large firms may be expected to make fuller use of special tax incentives and other schemes that require proximity to the center of government and to specialized counsel. On balance we would judge that our figures probably include a net upward bias in the tax incidence, which is more noticeable for agriculture than for industry.

Table 6.4 shows the resulting tax coefficients. The first column shows that business taxes made up less than 1 percent of total costs for all but six out of twenty-four sectors. Of these six, the most taxed were machinery (nonelectrical and electrical), with a business tax of approximately 5 percent on the value of output; beverages, with a tax of 4 percent; and nonmetallic mineral manufactures, with a tax of 2.5 percent. On a value added basis (column 2), the tax shares were obviously higher, though quite similarly distributed among sectors.

Although the values obtained are less than precise, owing to their method of estimation, they suggest that rates of business taxation were often higher on products at higher levels of fabrication, with some important exceptions. Basic metals were taxed less than metal products on an output basis, although the relation is reversed on a value added basis; on both measures taxation escalated to machinery; for vehicles, however, the opposite was the case. Clothing was less taxed than textiles, thus favoring the higher stage of elaboration, but furniture was more taxed than wood. Agriculture was less taxed than industry, and the lower taxation of mining reflected the special nature of petroleum exploitation.

Credit Incentives

The Colombian money market in 1969 had three main parts, each of which comprised a number of submarkets. The first of these parts was the commercial banking system. In 1969 it lent about Col$5,500 million to productive sectors at an average interest rate of 18 percent for a prime borrower.

A second market consisted of all subsidized credit, which amounted to about Col$10,300 million at an interest rate averaging 10.7 percent. The subsidized sector comprised a number of fragmented markets, since the various lenders had their own clientele who were usually unable to approach the other lenders. The main institutions in these markets were: Caja Colombiana de Credito Agrario, Industrial y Minero, which lent mainly to agriculture and in minor amounts to the rest of the economy; the Fondo Financiero Industrial, and Corporacion Financiera Popular, both lending mainly to industry; the Instituto de Fomento Industrial, which made equity investments as well as loans throughout the economy, but channeled most of its loans to industry; the Banco Ganadero and the Instituto Colombiano de Reforma Agraria (INCORA), whose funds went mainly to agricul-

Table 6.4. *Colombia: Business Taxes and Tax-subsidy Equivalents of Preferential Credit, by Two-digit Industry, 1969*
(percent)

	Ratio of Tax to Total Product Cost	Ratio of Tax to Value Added	Ratio of Credit Tax Subsidy to Total Product Cost
Coffee	0.15	0.15	2.98
Agriculture	0.13	0.15	1.48
Hunting & Fishing	0.16	0.19	0.27
Forestry	0.21	0.23	0.27
Mining	2.11	0.27	-0.20
Food Products	0.56	1.26	-0.31
Beverages	4.07	5.50	-0.24
Tobacco	0.07	0.11	-0.36
Textiles	0.58	2.68	-0.34
Clothing	0.19	0.43	-0.32
Wood Products	0.45	1.19	-0.27
Furniture	0.73	2.11	-0.29
Paper Products	0.37	0.80	-0.32
Leather Products	0.12	0.35	-0.34
Rubber Products	0.24	0.33	-0.35
Chemicals	1.49	2.34	-0.07
Refinery Products	0.10	0.35	-0.28
Nonmetallic Minerals	2.51	5.03	-0.21
Basic Metals	0.71	1.96	-0.25
Metal Products	0.88	1.53	-0.25
Nonelectrical Machinery	5.14	9.38	-0.33
Electrical Machinery	4.09	7.67	-0.34
Vehicles	0.20	0.28	0.23
Miscellaneous Industries	0.56	0.88	-0.31

Note: Table refers to traded goods only.

Table 6.5. *Colombia: Distribution of Credit by Broad Sector, 1969*
(thousand million pesos)

	Subsidized (14.5-10.7)		Commercial (14.5-18.0)		Extra-Bank (14.5-29.0)		Net Subsidy
	Volume	Subsidy	Volume	Subsidy	Volume	Subsidy	
Agriculture	9,322	354.2	-	-	-	-	354.2
Mining	60	2.3	60	-2.1	-	-	0.2
Manufacturing	708	26.9	2,520	-88.2	1,167	-169.2	-230.5
Construction	47	1.8	440	-15.4	200	29.0	42.6
Commerce	143	5.4	2,520	-88.2	-	-	82.8

Note: Figures in parentheses are the interest rates charged in the three sections of the credit market.

ture; and commercial banks, which were required to make investments in agriculture.

The third part of the money market absorbed the excess demand in the other two parts. This so-called extra-bank market was divided between the organized market and the unorganized market. The total value of loans in the extra-bank market ran between Col$5,000 million and Col$7,000 million, the bulk of which was used for installment sales, mortgages, and advance deposits for imports; in 1969 only an estimated Col$1,400 million were used for working capital and to finance production. Interest rates in the extra-bank market averaged 29 percent a year and were sometimes as high as 36 percent a year.

The weighted average (14.5 percent) of the interest rates paid in the three parts of the market implies that recipients of subsidized credit were in fact subsidized by some 3.8 percent, whereas users of commercial and extra-bank credit were taxed with regard to the average. Agriculture, including coffee producers, was the main customer of the official credit institutions and hence received most of the credit subsidy, while industrial and commercial activity was taxed on balance. Table 6.5 shows the distribution of credit by broad sectors, and Table 6.4 shows subsidies as a fraction of output on a two-digit industry basis.[15]

Effective Incentives, 1969

In this section we examine the combined effects of the various components of the Colombian incentive system in 1969 and compare them with estimates of what value added and cash flow after taxes would have been under free trade. We found it useful to separate the average incentives given to all sales of an industry and the incentives given to sales in the domestic market from incentives to exports. This method of analysis allows us to ascertain the extent to which the system was biased against exports. We also distinguish incentive rates by the type of commodity and by an industry classification at the two-digit International Standard Industrial Classification level. Effective protection or subsidy refers to the Balassa treatment of nontraded goods, unless stated otherwise.

It should be borne in mind throughout that a significant part of the incentives derived from the import licensing system. This means that the incentives as measured in 1969 are the composite result of government actions (prohibiting imports or rationing them through licensing), which gave an incentive of undetermined magnitude, *and* the operations of the market, which gave

Table 6.6. *Colombia: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Agriculture, Forestry and Fishing (I)	-42	-19	-22	-43	-21	-24	-23	-59	-38	-42	-40	-19	-23	-22	-62	-37	-41
Noncoffee Agriculture, Forestry, Fishing	0	-10	-10	1	-11	-10	-10	-12	-26	-26	10	-10	-9	-8	-12	-25	-25
Mining (IV)	-12	-21	-20	-11	-22	-21	-19	-27	-41	-39	-14	-25	-23	-21	-39	-43	-42
Primary Activities (I + IV)	-39	-19	-22	-41	-21	-24	-23	-57	-38	-41	-38	-18	-23	-22	-60	-37	-41
Processed Foods (II)	0	-12	-9	42	-17	-6	-4	24	-33	-20	58	-12	-7	-5	23	-37	-24
Processed Foods less sugar	0	-10	-8	51	-14	-1	-1	31	-30	-16	70	-21	-3	-2	31	-35	-20
Beverages and Tobacco (III)	0	9	9	-7	8	8	7	-22	-8	-8	-3	4	4	3	-26	-13	-13
Construction Materials (V)	0	-8	-8	5	-13	-12	-9	-3	-30	-29	15	-22	-17	-12	-3	-40	-38
Intermediate Products I (VI A)	0	-2	-1	19	-5	-1	-1	12	-19	-13	37	-7	-3	-2	18	-27	-19
Intermediate Products II (VI B)	0	12	12	-31	7	7	5	-509	16	15	-15	4	4	3	-58	2	1
Nondurable Consumer Goods (VII)	0	22	21	-35	23	22	16	-525	76	73	-26	20	19	14	-229	55	54
Consumer Durables (VIII)	0	32	32	-174	41	39	21	-455	-490[a]	-492[a]	-170	28	26	14	204[a]	-538[a]	-492[a]
Machinery (IX)	0	19	18	-18	18	16	11	4	86	83	-16	3	1	1	-38	11	7
Transport Equipment (X)	0	111	111	-89	161	161	108	3,028[a]	2,936[a]	-2,938[a]	-74	161	161	109	7,069[a]	-2,938[a]	-2,938[a]
Manufacturing (II, III, V - X)	0	6	6	26	5	7	5	17	-1	1	42	-1	4	3	19	-10	-7
Manufacturing less Beverages & Tobacco (II, V-X)	0	6	6	26	5	7	5	17	0	3	42	-1	4	3	19	-10	-6
Manufacturing less Sugar	0	8	7	29	7	9	6	21	3	5	46	4	6	4	23	-7	-4
All Industries less Coffee, Mining, Sugar	0	-1	0	14	-4	-3	-3	4	-18	-16	27	-16	-3	-3	6	-20	-18
All Industries (I-X)	-25	-7	-9	-28	-13	-15	-13	-45	-29	-32	-23	-14	-15	-13	-46	-31	-33

a/ Negative cash flow at free-trade prices.

this incentive a specific monetary value as measured by the scarcity premium.

The relationship between the level of production and the scarcity premium involves lags, during which high scarcity premiums in one period lead to higher production in the next, and thereby to lower premiums, which in turn affect production. Thus if the scarcity premiums in Colombia varied substantially over time, the production pattern observed in 1969 cannot be fully explained by protection levels in that year. And while we have little information on changes in scarcity premiums, there are cases on record (notably automobiles) in which these premiums increased abruptly when imports were more severely restricted.

Adjustment for Overvaluation

A proper analysis of the incentive system needs to take account of the fact that removal of the tariffs and export incentives would cause an adjustment in the exchange rate. Net effective incentive rates incorporate this exchange rate adjustment.

The protective rates used in estimating the free-trade exchange rate exclude those on coffee, mining products, and sugar. Coffee faced a very special situation owing to the existence of the International Coffee Agreement. Petroleum and sugar have been excluded in view of the rules that governed the pricing of their domestic sales and the requirement that domestic demand be satisfied before exports were allowed. As can be seen from the last line of Table 6.2, both the exports and domestic sales of all products other than coffee, mining products, and sugar received nominal protection of 13 percent. In the absence of information on those elasticities, we have used an overvaluation adjustment of 13 percent. This adjustment assumes, however, that there would be an export tax on coffee and no change in the peso earnings realized per dollar of exported petroleum or sugar. Thus, we are considering a modified free-trade situation.

Average Net Incentives

We have measured effective incentives in two ways: by taking value added as a base and by taking cash flow as a base. The first group of measures—effective protection and effective subsidy rates—are an indication of the extent to which factor payments as a whole are affected by the incentive system; the measures taking cash flow as a base are an indication of the extent to which profitability has been affected by the incentive system. Even though they are subject to numerous errors, measures based on the cash flow are of interest in the Colombian situation because real wages hardly changed during the 1960s, and if wages do not respond to changes in output caused by protection, the entire increase in value added per unit of output will accrue to the other factors of production.

NET EFFECTIVE PROTECTION AND SUBSIDY ON VALUE ADDED. The average net rate of effective protection in the economy as a whole was negative, at −15 percent (Table 6.6). The average net rate of effective subsidy is by definition equal to the average net rate of effective protection and hence was also −15 percent.

The primary sectors were taxed, the average net rate of effective protection being −24 percent and of effective subsidy −23 percent, whereas manufacturing was subsidized, with an average effective protection rate of 7 percent and effective subsidy rate of 4 percent. Much of the taxation of agriculture reflects the taxation of coffee, which paid higher taxes than did other agricultural production and weighs heavily in the average. Agriculture apart from coffee, plus forestry and fishing, had less negative net effective protection and subsidy (−10 percent and −9 percent, respectively). Mining (mainly petroleum) also has a negative indicator, with −21 percent effective protection and −23 percent effective subsidy (Table 6.6).

These data imply that Colombia has transferred income from primary activities to manufacturing through its incentive system. This transfer was fundamentally the result of the system of import protection, which more than offset the transfer by the domestic tax system from manufacturing to agriculture.

Table 6.7 shows the structure of net incentives by trade categories of industry. The incentives afforded to export industries (including coffee) were negative at −43 percent. Manufactured export industries had negative incentives of about −14 percent.

As in the case of nominal protection, the highest incentives were those on import-competing products at about 25 percent, while non-import-competing products were taxed at about −7 percent. The explanation lies in the nature of the import controls. We have classified products as competing with imports if more than 10 percent of total supply is imported. In well-established industries, which are able to supply the domestic market fully and on occasion to export, imports will constitute less than 10 percent of domestic supply, and there will have been enough domestic competition to drive the scarcity margin down considerably. Thus the more established industries appear in the non-import-competing group, which as a consequence emerges as having low protection rates.

Newer industries, however, are not yet able to satisfy the whole market; imports are therefore allowed but in

Table 6.7. *Colombia: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Export Industries	-42	-37	-38	-45	-42	-43	-41	-61	-59	-59	-43	-43	-43	-41	-64	-58	-60
Primary	-50	-45	-46	-51	-46	-48	-47	-66	-62	-64	-50	-45	-47	-46	-70	-61	-64
Manufacturing	0	-16	-13	15	-20	-13	-10	4	-37	-29	29	-38	-14	-11	6	-41	-31
Export-and-Import-Competing Industries	0	16	15	-12	-1	-3	-1	-15	-29	-31	-7	-12	-9	-6	27	-30[a]	-31[a]
Manufacturing	0	16	15	-12	-1	-3	-1	-15	-29[a]	-31[a]	-7	-12	-9	-6	27	-30	-31
Import-Competing Industries	0	22	21	-32	29	27	19	-275	130	125	-18	24	23	16	-75	88	86
Manufacturing	0	22	21	-32	29	27	19	-275	130	125	-18	24	23	16	-75	88	86
Non-Import-Competing Industries	0	-5	-5	17	-8	-7	-6	6	-23	-21	30	-19	-6	-6	6	-24	-22
Primary	0	-10	-10	1	-11	-10	-10	-12	-27	-26	10	-20	-8	-8	-11	-26	-25
Manufacturing	0	2	2	42	0	3	2	28	-13	-8	60	-16	0	0	27	-19	-14
All Industries	-25	-7	-9	-28	-13	-15	-13	-45	-29	-32	-23	-14	-15	-13	-46	-31	-33
Primary	-39	-19	-22	-41	-21	-24	-23	-57	-38	-41	-38	-19	-23	-22	-60	-37	-41
Manufacturing	0	6	6	26	5	7	5	17	-1	1	42	-1	4	3	19	-10	-7

a/ Negative cash flow at free-trade prices.

carefully limited quantity, which drives up the scarcity premium on these goods. In consequence, Colombia's newer industries appear as import competing, because imports make up more than 10 percent of domestic supply, although they receive high protection from import licensing.[26]

The export-and-import-competing industries have been able to bring their costs sufficiently under control to be able to export. At the same time, some of them still make use of high margins on their domestic sales, and may cross-subsidize their export sales, by selling at marginal cost and absorbing fixed costs in their domestic sales. In 1969 these industries obtained a −3 percent net effective rate of protection and a net effective subsidy of −9 percent (Table 6.7).

Table 6.6 shows a different dimension of the incentive system—a pattern of escalation that is similar for both effective protection and effective subsidies. Within manufacturing, construction materials had the lowest effective rates of protection and subsidy (−12 percent and −17 percent), followed by processed foods (−6 percent and −7 percent) and intermediate products I (−1 and −3 percent), and intermediate products II (7 percent and 4 percent) and nondurable consumer goods (22 percent and 19 percent), while consumer durables had effective protection of 39 percent and an effective subsidy of 26 percent, and transport equipment had rates of 161 percent under both measures. The structure of incentives was affected by economies of scale in consumer durables and transport equipment in that production costs were raised by small production runs and thus required high protection to survive. Table 6.8, which shows the pattern of incentives among industries at the two-digit level, offers additional insight into the incentive structure and its underlying productivities.

EFFECTIVE PROTECTION AND SUBSIDY ON A CASH FLOW BASIS. The average rates of effective protection and effective subsidy to cash flow were −32 and −33 percent, respectively (Table 6.6), and indicate a transfer of resources from producers to consumers—specifically, from profit receivers to other income receivers. Like the measures based on value added, those based on cash flow show that primary industries were taxed and manufacturing subsidized, although the range is now considerably greater. On the basis of effective protection to cash flow, the primary sector was taxed at a rate of −41 percent and all manufacturing was subsidized at a rate of +1 percent. On an effective subsidy basis, the corresponding figures are −41 percent and −7 percent. Again, the results for the primary sector are affected by those for coffee, which was taxed at −70 percent. For agriculture other than coffee, plus forestry and fishing, the effective rates on cash flow were −26 percent and −25 percent (Table 6.6).

The incentives by trade orientation shown in Table 6.7 indicate that export industries were much more heavily taxed on a cash flow than on a value added basis: at 60 percent rather than at 43 percent. The non-import-competing group now appears to have been most taxed, with an effective protection to cash flow of −21 percent and an effective subsidy to cash flow of −22 percent. Export-and-import-competing industries also appear to have been more heavily taxed on the basis of cash flow. There are significant changes in the magnitude of the incentives shown for import-competing industries as we move from a value added to a cash flow basis. These industries obtained an effective protection rate of 125 percent and an effective subsidy rate of 86 percent on cash flow, compared with rates around 20 percent on a value added basis.

The breakdown within each category between primary and manufacturing activities is also instructive. Data on effective subsidies to value added suggest that within the export industries the primary sectors bore most of the burden, taxation being 47 percent; industries that manufactured for export were taxed on the average, but their export sales were subsidized (−38 percent and 29 percent; Table 6.7). In non-import-competing industries, the average tax of about 6 percent reflects an 8 percent tax on primary production and zero net incentive to manufacturing. There were no primary activities in the remaining two groups.

In turn, exports of non-import-competing manufactures had a positive effective subsidy of 60 percent, while the manufactured exports of import-competing industries received an effective subsidy of −18 percent. Finally, manufactured exports in the export-and-import-competing category received negative effective subsidies of 7 percent, but the manufactured exports of export industries received a positive effective subsidy of 29 percent.

The escalation of the incentive rates on a cash flow basis that can be seen in Table 6.6 is steeper but otherwise little different from the pattern of rates based on value added. Construction materials and processed foods show the lowest rates of effective subsidy to cash flow, at −38 percent and −24 percent, respectively; beverages and tobacco are close behind at −13 percent. The intermediate products are now in the next group: intermediate products I had an effective rate of −19 percent and intermediate products II had a rate of 1 percent. The consumer goods industries received high rates, 54 percent for nondurable consumer goods and −492 percent for durable consumer goods; the cash flow for durable consumer goods was negative at free-trade

Table 6.8. *Colombia: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Two-digit Industry, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Coffee	-56	-56	-56	-56	-56	-56	-56	-70	-70	-70	-55	-55	-55	-55	-70	-70	-70
Noncoffee Agriculture	0	-10	-10	1	-11	-10	-10	-12	-27	-26	10	-10	-9	-8	-1	-26	-25
Hunting & Fishing	0	15	11	-3	14	10	10	-18	2	-3	5	12	11	11	-10	-2	-4
Forestry	0	-12	-11	0	-12	-12	-11	-13	-28	28	8	-12	-12	-11	-5	-29	-28
Mining	-12	-21	-20	-11	-22	-21	-19	-28	-41	-39	-14	-24	-23	-21	-31	-44	-42
Food Products	0	-12	-9	42	-17	-6	-4	24	-33	-20	58	-32	-7	-5	23	-37	-24
Beverages	0	34	34	-13	31	31	26	-28	12	12	-12	9	23	20	-33	4	4
Tobacco	0	-12	-12	4	-13	-13	-12	-12	-28	-28	12	-13	-13	-12	-4	-29	-29
Textiles	0	8	7	-17	0	-1	-1	-34	-10	-12	-6	-1	-3	-2	-29	-16	-17
Clothing	0	3	3	17	-1	-1	0	48	-12	-12	35	-13	-1	-1	70	-16	-16
Wood Products	0	-4	-3	1	-11	-9	-6	-4	-30	-25	18	-28	-10	-7	16	-44	-31
Furniture	0	-4	-4	1	-11	-11	-7	25	-37	-37	17	-13	-13	-9	75[a]	-54	-53
Paper Products	0	8	7	-24	0	-1	-1	26[a]	23	23	3	-15	-3	-2	-87	-12	-8
Leather Products	0	7	6	-19	3	-1	0	-233	108	73	0	-13	-2	-1	61	11	17
Rubber Products	0	-1	-1	-13	-7	-7	-6	-33	-21	-21	-2	-18	-8	-7	-21	-24	-24
Chemical Products	0	33	32	-34	36	34	24	-185[a]	-1,583[a]	-1,305[a]	-26	37	30	21	90[a]	-1,513[a]	-1,306[a]
Refinery Products	0	-23	-18	75	-26	-9	-6	66	-42	-24	101	-40	-10	-7	70	-46	-27
Nonmetallic Minerals	0	-8	-8	4	-14	-13	-9	-6	-32	-30	12	-29	-17	-13	-8	-42	-39
Basic Metals	0	18	17	-336	-3	-10	-2	348[a]	-26[a]	-22[a]	-250	-28	-35	-5	298[a]	25[a]	-22[a]
Metal Products	0	12	11	-14	9	9	7	-32	11	10	-2	6	6	5	-21	1	0
Electrical Machinery	0	63	62	-183	148	143	57	-816	-239[a]	-234[a]	-187	111	106	43	418[a]	-240[a]	-235[a]
Nonelectrical Machinery	0	14	12	-16	13	10	7	37	39	39	-15	0	-3	-2	-35	-10	-13
Transport Equipment	0	111	111	-89	161	161	108	3,028[a]	2,938[a]	-2,938[a]	-74	161	161	109	7,609[a]	-2,938[a]	-2,938[a]
Miscellaneous Industries	0	33	33	-51	45	41	30	-142	81	74	-37	44	39	28	-91	66	60

a/ Negative cash flow at free-trade prices.

prices. Machinery had an effective rate of subsidy to cash flow of 7 percent—only somewhat higher than the effective subsidy on its inputs, most of which are grouped in intermediate products II. Finally, the production of transport equipment yielded a negative cash flow at free-trade prices: its effective rate of subsidy was −2,938 percent.

At the two-digit ISIC level, beverages, chemicals, electrical machinery, transport equipment, and miscellaneous industries received the highest rates of effective subsidy on value added, and all of them had negative cash flow at free-trade prices. This implies that under free trade these industries could not have survived. At the other extreme, food products, tobacco, textiles, clothing, wood products, furniture, paper, leather products, rubber products, refinery products, nonmetallic minerals, and nonelectrical machinery had negative effective subsidies on value added (Table 6.8).

Net Incentives to Export Sales

In evaluating the indicators in Tables 6.6–6.8, it must be borne in mind that these are averages built up from the more detailed figures of Appendix Table 6.1 through weighting by realized export values. An upward bias is thus introduced into the numbers, since sectors receiving low incentives are likely to have few or no exports and hence no weight. For sectors that did not export at all, the export incentive shown in the tables is zero; even if an incentive existed, none was in fact used.

NET EFFECTIVE SUBSIDY TO VALUE ADDED IN EXPORTS. All sectors in the economy taken together were subject to an export tax, equal to an effective subsidy of −23 percent on a value added basis (Table 6.6). Excluding coffee, mining, and sugar, however, exports received a positive effective subsidy of 27 percent. Manufacturing industries had an effective subsidy rate of 42 percent. Even if we allow for the bias that is due to weighting, these export subsidies were high by international standards.

Export industries as a group were taxed at 43 percent (Table 6.7), but this disaggregates into a tax of 50 percent on primary export industries and a subsidy of 29 percent on manufacturing. Exports of manufactures by import-competing industries received an effective subsidy to value added of −18 percent, those by non-import-competing industries received effective subsidies of 60 percent, and those by export-and-import-competing industries a rate of −7 percent. The range of these rates is surprisingly wide. With primary non-import-competing industries protected at an average rate of 10 percent, the pattern of export incentives varied to a considerable extent within this category.

Within manufacturing, effective subsidies to value added ranged from −170 percent on durable consumer goods to +70 percent on processed foods other than sugar (Table 6.6). There is no evidence of escalation. Indeed, some final goods such as durable consumer goods, machinery, and transport equipment are at the lower end of the spectrum, with negative rates; others such as processed foods (including sugar) are at the top (58 percent); yet nondurable consumer goods had a rate of −26 percent, and beverages and tobacco a rate of −3 percent. Intermediate goods I had a rate of 37 percent, and intermediate goods II a rate of −15 percent.

The classification by two-digit sectors in Table 6.8 shows that effective subsidies ranged from −250 percent to +161 percent, but that most of them were between −15 and +35 percent. The high taxation of basic metals and electrical machinery (−250 and −187 percent, respectively) stands out, since in those sectors export value added was negative. Otherwise no noteworthy pattern is discernible.

NET EFFECTIVE SUBSIDY TO CASH FLOW IN EXPORTS. On the average, the net effective subsidy to cash flow of realized exports was −46 percent, comprising rates of −60 percent for primary goods and +19 percent for manufacturing (Table 6.7). The breakdown by trade orientation in Table 6.7 shows negative rates for export industries as a group, but a positive rate of 6 percent for manufacturing export industries. Exports of manufactures by import-competing industries were taxed at 75 percent, while those of non-import-competing industries were subsidized at an average rate of 27 percent. Those of export-and-import-competing industries received a positive effective subsidy of 27 percent to cash flow.

In assessing the sectoral indexes, it must be borne in mind that the numerator or denominator or both can be negative in the cash flow indicator, reflecting the possibility of losses under protection or under free trade or both. At the same time, comparisons of the absolute size of the cash flow in the two situations indicate whether the industries are favored or discriminated against under protection. For example, chemical products in 1969 had negative cash flows under both situations, the protected cash flow being more negative than its free-trade counterpart. Thus, although its effective subsidy to export cash flow was 90 percent, the industry was taxed by the system of protection.

For most of the industry groups, the export incentives measured on the basis of cash flow are lower than those based on value added; notable exceptions are durable consumer goods and transport equipment. The two-digit breakdown shown in Table 6.8 reveals no similarity in cash flow and value added indicators; indeed, the

Table 6.9. *Colombia: Number of Three-digit Sectors with Anti-export Bias, by Industry Group, 1969*

	Number of Sectors	Sectors with Anti-export Bias			
		Absolute		Relative	
		Value Added Basis	Cash Flow Basis	Value Added Basis	Cash Flow Basis
Primary Activities (I)	4	1	4	1	0
Processed Foods (II)	9	2	4	2	2
Beverages & Tobacco (III)	3	2	3	2	2
Mining (IV)	1	1	1	0	0
Construction Materials (V)	4	1	1	1	1
Intermediate Goods I (VI A)	11	4	8	4	4
Intermediate Goods II (VI B)	28	17	22	15	18
Nondurable Consumer Goods(VII)	25	12	13	11	12
Consumer Durables (VIII)	3	3	2	2	2
Machinery (IX)	6	6	4	5	4
Transport Equipment (X)	2	2	2	2	2
	96	51	64	45	47

Spearman rank order correlation coefficient between them is only 0.57. Note in particular the effective rates of subsidy on cash flow in exports of clothing (70 percent), leather products (61 percent), and refinery products (70 percent). The cases of effective taxation were mild in industry groups in which cash flow was positive at free-trade prices. But in the three out of five groups in which cash flow was negative—basic metals, electrical machinery, and transport equipment—taxation was very high.

Bias against Exports

In examining how far the incentive system was biased against exports, it should be borne in mind that our system for averaging export incentive rates tends to overstate the protection received by exports. This is because products receiving higher incentives are more likely to be exported; thus the weights will be attached to lower rates. The resulting average will thus be higher than if all products, whether or not exported, were given the same weight.

A bias against exports may take two forms: an absolute anti-export bias, or discrimination against production for the export market compared with the situation under free trade; or a relative anti-export bias, whereby the incentive to sell on the domestic market exceeds that for exports, to make export sales less profitable than domestic sales.

ABSOLUTE ANTI-EXPORT BIAS. The point of reference for measuring absolute anti-export bias is zero net effective subsidy on value added. At this point, the factors engaged in producing exports receive exactly what they would obtain under free trade at the free-trade exchange rate. Table 6.6 shows that there was an absolute bias against exports in seven industry groups in addition to coffee: mining, beverages and tobacco, nondurable and durable consumer goods, machinery, transport equipment, and intermediate products II. Table 6.8 shows that eleven two-digit industries other than coffee had negative net effective subsidies on value added. At the three-digit level, 51 out of the 96 sectors had factor incomes below those obtainable under free trade, distributed widely among the ten industry groups, as can be seen from Table 6.9. Indeed, in mining, durable consumer goods, machinery, and transport equipment, all the sectors suffered absolute anti-export bias.

On a cash flow basis, the base line of zero indicates profitability under free-trade conditions. On this basis, 64 out of 96 three-digit sectors show absolute anti-export bias (Table 6.9). Among the ten industry groups, intermediate goods I and II had three fourths of their three-digit sectors affected by absolute anti-export bias, while nondurable consumer goods and processed foods had about half their sectors affected. Absolute anti-export bias was also widespread among the more disaggregated industrial groups. It affected all three-digit sectors in primary activities, transport equipment, beverages and tobacco, and mining, and two thirds of those in machinery and durable consumer goods.

RELATIVE ANTI-EXPORT BIAS. Effective subsidies were quite similar for exports and for domestic sales, whether measured on the basis of value added or of cash flow. Table 6.9 shows that at the three-digit level 45 out of the 96 sectors received effective subsidies to value added in production for domestic sales greater than those to export sales (on a cash flow basis the number is 47 out of 96). In several of the ten industry groups, the relative anti-export bias was greater than 50 percent—that is, value added in sales in domestic markets exceeded that in export sales by more than 50 percent. The bias was greatest for beverages and tobacco, consumer durables, machinery, and transport equipment. In the first group the bias was entirely in beverages; consumer durables have been noted before to have very high protection, so that the relative bias against exports is not surprising; and the last two groups catered largely to the domestic market. Domestic production was also favored over exports in intermediate products II, whereas the opposite was the case for the remaining industry groups (Table 6.6).

Relations among Indicators of Incentives

An indication of how the different incentive measures are related can be obtained by calculating their Spearman rank order correlations. Consider first the correlations among average incentives for all sales. It is evident that all indicators with the same base, whether value added or cash flow, are highly correlated. Indeed, for the indicators based on value added, the Spearman rank correlation coefficient ranges from 0.79 to 0.98, while it takes values from 0.81 to 0.98 for those based on cash flow. The correlations are slightly lower on balance among the net indicators than they are among the gross group of indicators. Moreover, effective protection to cash flow is somewhat more closely correlated with the other incentive measures than is effective subsidy to cash flow, all measured at the existing exchange rate, but the reverse is true if adjustment is made for overvaluation relative to the free-trade situation. Finally, the ranking by rates of nominal protection is highly correlated with the rankings by the value added–based indicators (rank correlation coefficients of 0.79 to 0.93), but not at all with the rankings by cash flow–based indicators (0.17 to 0.29).

In comparing the incentives to domestic and to export sales, and in comparing these with the average indicators, we find that average incentives are highly positively correlated with incentives to domestic sales, while correlations between average and export incentives are lower and negative; and that correlations between domestic and export incentives are moderate and negative (with the single exception of net subsidies to cash flow in domestic sales and exports, which show a Spearman correlation coefficient of -0.85). We can conclude from this analysis that the separate examination of incentives by market (domestic/foreign) and by base (value added/cash flow) is important.

Incentives and Economic Performance

In the previous sections we examined the characteristics of Colombia's incentive system and its possible effects on the sectoral composition of output. In this section we evaluate the effects of the incentive system on Colombia's goals of economic growth, full employment, and equitable income distribution. We first examine how the main characteristics of the incentive system affected overall growth and export performance, and thereafter consider how the system affected the use and allocation of resources.

Assessing the system of incentives is particularly difficult because we have observed its elements only at a single point in time. As noted earlier, the dynamic forces of Colombia's incentive system derived in large part from the quantitative import restrictions used. Since data are not available on changes in scarcity premiums over time, we must be cautious in drawing conclusions.

The Incentive System and Overall Growth

Colombia's economy has been constrained by the amount of foreign exchange available during much of the post–World War II period.[27] This situation is the product of two factors: Colombia's strong comparative advantage in the production and export of coffee; and the strategy of growth based on import substitution followed for most of the period.

The country's strong comparative advantage in coffee implies that a uniform exchange rate and free trade would lead to strong specialization in coffee, and that unemployment would probably be substantial. The precise equilibrum point of the economy would depend heavily on supply conditions in the labor market. On the one hand, if workers attempted to obtain in the rest of the economy the same real income that they could obtain in coffee, few sectors other than coffee would be active. On the other hand, if they were prepared to accept lower real wages, and the labor market were competitive, this would imply large rents for the owners of coffee land and consequent skewness in the income distribution. Under such circumstances a tax on coffee land would be called for on distributive grounds.[28] The demand elasticity for Colombian coffee is low, however, and under the provisions of the International Coffee Agreement, whereby Colombia has a fixed quota, it is effectively zero.

In the absence of land taxes, an exchange rate system that discriminates against coffee and favors all other sectors would then appear to be an appropriate solution on grounds of both efficiency and distribution. A possible way of accomplishing this is to set the exchange rate for products other than coffee so as to provide full utilization of labor and capital and efficient allocation, while setting the differential between the two rates so as to hold coffee rents down.[29]

Colombia did in fact have a lower exchange rate for coffee than for other products. But until export incentives were increased, protection accorded the other sectors a higher exchange rate for output to be sold on the domestic market than for output to be exported. As a result, the industrial sector became a foreign exchange–using sector, relying to a considerable extent on imported industrial inputs, and industrial growth therefore came to be limited largely by the foreign exchange available from coffee exports.

This situation implied an internal contradiction in development strategy: industry was to lead in the creation of income and employment but industrial growth could not surpass the growth of coffee revenues, since otherwise the growth in demand for foreign exchange would outpace the growth in supply. Had industry been able to export, its rate of growth would no longer have been tied to the growth of primary export revenues, because industry could have paid for its growing import needs out of its own export revenues. The foreign exchange constraint was thus a direct consequence of the trade policy pursued.

Despite the periodic efforts to promote exports during the 1950s and 1960s, a consistent reform of the incentive system was not undertaken until 1967. By 1969 the incentive system had settled into its new mode, but its full effects were not yet apparent, since exports took time to react to the incentives provided.

Examination of the incentive system of 1969 shows that it differentiated between the coffee sector and other sectors. An important precondition for full employment with an acceptable income distribution was therefore in place. The second major desirable characteristic of Colombia's incentive system in 1969 was its discrimination between domestic and export sales. Given the country's economic history, export incentives were needed to

overcome the natural hesitancy of Colombian suppliers to penetrate the foreign market and of foreign customers to buy Colombian goods for the first time. As the preceding section has shown, incentives were biased in favor of exports in about half the three-digit sectors, but an anti-export bias existed in the others.

It is thus possible to conclude that, on balance, the incentive system in 1969 had the major qualitative characteristics necessary for a full and efficient allocation of resources. Even so, and despite the clear improvement over the incentive structure of the early 1960s, the actual magnitude of the incentives produced neither a full nor an efficient utilization of resources.

Incentives and Export Performance

The exchange reform of 1967 provided an exchange rate that was to be made stable in real terms by compensating for domestic cost increases. Table 6.10 shows real exchange rates from 1949 to 1974.[30] Column 3 shows the nominal exchange rate adjusted for domestic (Colombian) inflation. Stabilization of domestic costs in terms of dollars meant keeping the values shown in this column constant, and the fluctuations are noticeably smaller during 1967–72 than in earlier periods. Adjusting further for world inflation (Column 4) yields a real exchange rate (Column 5), which increased fairly steadily between 1967 and 1974.

The growth of minor exports has accelerated since 1966. The increase in the real exchange rate to exporters and its reduced variability thus appear to have been associated with the growth of minor exports. Attempts to test this relation, however, have not yielded conclusive results.

Teigeiro and Elson fitted a double-log regression to annual data for 1948–71 and to quarterly data for 1960–71 using minor exports as the dependent variable and a measure of the real exchange rate affecting these exports as the main independent variable.[31] This measure of the real exchange rate takes account of the incentives applicable to all exports, and the provisions of the Plan Vallejo, for regressions involving only manufactured exports. The response elasticity varies between 0.9 and 5.4 depending on what other explanatory variables are included (for example, the share of exports to LAFTA), whether all minor exports or only manufactures or agricultural exports are involved, and whether the export incentives are incorporated in the exchange rate or shown separately. The results show acceptable $\bar{R}^2$s of 0.65 or above, but low Durbin-Watson statistics (at best 2.15) indicate the existence of serial correlation. Some of the results, however, are puzzling: for example, the coefficient for the CAT is negative and in at least one case has a t value below 1.[32]

Diaz-Alejandro ran similar regressions on annual data for 1954–70 and 1958–59 as well as on quarterly data for various subperiods between 1954 and 1971.[33] Rather than the double-log form, he used annual percentage changes in his variables; as a result, serial correlation appears to be no problem. His dependent variable is either total minor exports or bananas, cotton, sugar, and tobacco; for the latter group he has a quantum as well as a value index. His independent variables include the real export exchange rate (excluding the provisions of the Plan Vallejo and credit incentives, but incorporating all other incentives) and an index of instability in the real exchange rate. The resulting exchange rate elasticities run from 0.13 to 1.5, and many are bunched around 0.8. The years included in the series seem crucial: from 1954–70 to 1958–69, the response elasticity drops from 0.9 to 0.4.[34] Going from value to quantum causes another drop, from 0.54 to 0.13. Moreover, the regressions yielding low elasticities have higher $\bar{R}^2$s. Instability of the exchange rate, however, appears to be an important variable hindering export growth.

The estimates cited are likely to be biased downward, since they make no provision for the fact that exports take time to respond to an increase in incentives, perhaps because new markets need to be developed and stable supplies established. Nor is it easy to take account of threshold effects, whereby new exports enter the market at different levels of incentives.[35] We agree with Diaz-Alejandro that despite the weakness of the econometric findings it is reasonable to conclude that the Colombian system of incentives has promoted nontraditional exports, and that it has done so in part through the level of the incentives given, and in part through the constancy of the export policies.

Incentives and the Use of Resources

Two important questions require investigation. The first concerns the allocation of resources: Could welfare have been greater had Colombia deployed in a different way the factors of production employed at the time of this study? The answer lies in a calculation of comparative costs and may differ depending on the time frame chosen, which will determine whether capital is regarded as a sunk cost.

The second question concerns the utilization of resources, including those that were not employed. In Colombia in the 1960s both labor and capital were far from fully employed. The International Labour Office estimates that 25 percent of the urban labor force was unemployed in 1967.[36] According to survey results obtained by Thoumi, capital was idle for approximately 40 percent of the time.[37] With such levels of underutilization of both domestic factors of production, increased

Table 6.10. *Colombia: Real Exchange Rates, 1949–74*
(pesos per U.S. dollar)

	Nominal Rate a/ (1)	Index of Domestic Prices 1970=100 (2)	Cost Parity (3)	Index of World Prices 1970=100 (4)	Real Exchange Rate (5)
1949	1.95	.159	12.26	.654	8.02
1950	1.95	.179	10.89	.694	7.56
1951	2.50	.193	12.95	.810	10.49
1952	2.51	.191	13.14	.809	10.63
1953	2.51	.205	12.24	.792	9.70
1954	2.51	.223	11.25	.794	8.93
1955	2.51	.221	11.35	.796	9.04
1956	2.51	.235	10.68	.820	8.75
1957	5.97	.271	22.03	.838	18.46
1958	7.22	.311	21.81	.828	18.06
1959	6.40	.333	19.22	.832	15.99
1960	6.70	.346	19.36	.837	16.21
1961	6.70	.376	17.81	.845	15.06
1962	9.00	.385	23.38	.850	19.87
1963	9.00	.509	17.68	.866	15.31
1964	9.00	.598	15.05	.880	13.24
1965	13.51	.619	21.82	.901	19.66
1966	13.50	.742	18.19	.920	16.74
1967	15.82	.803	19.76	.915	18.03
1968	16.95	.850	19.94	.915	18.24
1969	17.93	.936	19.15	.967	18.53
1970	19.70	1.000	19.70	1.000	19.70
1971	21.00	1.090	19.26	1.070	20.61
1972	22.88	1.246	18.36	1.154	21.19
1973	24.89	1.530	16.27	1.451	23.60
1974	28.69	1.963	15.08	1.700	25.62

a/ At end of period.

Sources: Nominal rates and domestic rates from International Monetary Fund, International Financial Statistics (May 1977); other columns from authors' estimates.

output in one sector need not come at the expense of reduced output elsewhere.

The utilization question cannot be answered by a comparative-cost calculation, since the issue is not which of several outputs should be produced. Rather, a benefit-cost calculation must be used to compare the marginal social cost of the factors to be utilized with the marginal social utility of the output. Again, the answer may differ in the short and in the long run since existing fixed assets cannot be transferred from sector to sector, but new investment funds can be.

It should be emphasized at the outset that the comparative-cost calculation of allocation and the benefit-cost analysis of utilization are complementary—not substitutes for each other—since they focus on different sources of welfare gain. Thus, the gains that could be achieved by more efficient use of the factors currently employed (allocation gains) add to the gains that could be achieved by using more of the available factors of production (utilization gains).

LONG-RUN AND SHORT-RUN COMPARATIVE COSTS. Our index of comparative cost is the direct domestic resource cost (DRC) of saving or earning a unit of foreign exchange in a given economic activity.[38] Since the exchange saved or earned is equal to the foreign exchange value of the output less the foreign exchange value of the material inputs, it is also equal to value added at world prices. If factor costs are expressed in market prices and world value added is expressed in domestic currency at the official exchange rate, the DRC is equal to 1 plus the Corden effective rate of protection. For a proper measurement of the DRC, however, factor costs must be taken at shadow prices and the relation with the Corden indicator modified.

Unfortunately, no reliable estimates of shadow prices for Colombia exist to our knowledge, nor is it possible for us to construct such estimates within the confines of this investigation. We are thus forced to use rough approximations derived from general considerations and to test our conclusions for sensitivity to the values used as shadow prices.[39]

In the case of the shadow price of labor, it should be noted that at a high level of unemployment the marginal social cost of labor is likely to be substantially below the market wage. We have assumed that the shadow wage is between 0.4 and 0.6 of the market wage and have used ratios of 0.4, 0.5, and 0.6. Determining the shadow price of capital is also difficult, but we have concluded on balance that it lies above the market price. The values used for our calculations are 1.2, 1.5, and 2.

In our estimates of comparative costs we have distinguished between the short run, when capital costs can be regarded as sunk because capacity is already installed, and the long run, when new investment is required. Since the use of existing capacity may under certain circumstances entail a user cost, we have also prepared estimates of short-run comparative costs on the assumption that the user cost of capital is equal to one quarter of the investment costs.

The Spearman rank order coefficients between market-priced and shadow-priced DRC ratios are fairly low. In turn, rank correlation coefficients are between 0.69 and 0.99 when the various rankings based on shadow prices are compared. The implication is that the shadow pricing of factors affects the comparative cost position of the individual sectors to a considerable extent and that variations in the shadow prices make a difference in accordance with the extent to which they affect *relative* factor costs. In particular, including a zero cost of capital among the alternatives greatly increases the variability of the relative factor costs. Correspondingly, the results are more sensitive to the choice of shadow prices for the short-run indicators than they are for the long-run indicators.

Finally, for identical shadow prices of labor, the rank correlation coefficients between short- and long-run comparative cost indexes vary between 0.72 and 0.12 when the costs of using existing capacity are taken to be positive. When these costs are taken to be zero, the Spearman coefficients are generally negative (-0.17 to -0.49) and thus indicate an inverse correlation, albeit not a very strong one.

Table 6.11 presents the frequency distributions of the direct domestic resource cost ratios for different assumptions about shadow prices. For the long-run comparative costs, rates are concentrated between zero and twice the official exchange rate, whereas only a few rates are above two, except when extreme values have been chosen for capital. Furthermore, estimates are closest together at market prices, and become more dispersed as the relevant shadow prices diverge from the relative market prices. It is clear from this tabulation that in 1969 Colombia had considerable scope for increasing welfare through the reallocation of resources.

Almost all the short-run comparative costs are concentrated between zero and the official exchange rate. This result implies that there was scope for allocating resources more efficiently in the short run, but that the welfare gains would have been much more limited than those from reallocating resources in the long run.

Table 6.12 shows the distribution of the costs of foreign exchange by industry groups. The wide range of domestic resource costs within each group implies that Colombia's comparative advantage is spread throughout the industrial sector. As a consequence, a movement

Table 6.11. *Colombia: Range of Direct Domestic Resource Cost of Foreign Exchange, by Sector*

A. Long Run	PL = 0.4			PL = 0.5			PL = 0.6			PL = 1.0			PL = 1.0
DRC	PK=1.2	PK=1.5	PK=2.0	PK=1.2	PK=1.5	PK=2.0	PK=1.2	PK=1.5	PK=2.0	PK=1.2	PK=1.5	PK=2.0	PK=1.0
<0	1	1	3	1	1	2	1	1	1	1	1	1	1
0.001 - 1.000	46	19	5	38	16	5	25	9	5	2	2	3	8
1.001 - 1.200	24	25	10	28	20	8	37	19	4	35	4	0	55
1.201 - 1.400	14	20	10	17	24	11	20	26	12	29	31	4	18
1.401 - 1.800	9	21	37	10	24	36	11	30	35	22	45	35	12
1.801 - 2.000	0	5	10	0	5	11	0	5	16	5	3	20	0
2.001 - 2.500	2	3	15	2	4	17	2	4	16	0	8	22	2
2.501 -3.000	0	2	4	0	2	4	0	2	5	2	0	9	0
>3	0	0	2	0	0	2	0	0	2	0	2	2	0

B. Short Run	PL = 0.4				PL = 0.5				PL = 0.6				PL = 1.0			
DRC	PK=0	PK=.3	PK=.375	PK=.5	PK=0	PK=.3	PK=.375	PK=.5	PK=0	PK=.3	PK=.375	PK=.5	PK=0	PK=.3	PK=.375	PK=.5
<0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0.001 - 0.500	93	84	73	40	92	75	71	9	88	54	42	4	59	18	8	1
0.501 - 1.000	2	11	22	53	3	20	24	84	6	41	52	89	33	69	78	78
1.001 - 3.000	0	0	0	2	0	0	0	2	1	0	1	2	3	8	9	16
>3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: PL denotes the wage rate and PK the price of capital. The assumptions made about shadow prices are explained in the text.

Table 6.12. *Colombia: Range of Direct Domestic Resource Cost of Foreign Exchange, by Industry Group (Long Run)*

		PL = 0.4			PL = 0.5			PL = 0.6			PL = 1.0		
		PK=1.2	PK=1.5	PK=2.0	PK=1.2	PK=1.5	PK=2.0	PK=1.2	PK=1.5	PK=2.0	PK=1.2	PK=1.5	PK=2.0
Primary Activities (I + IV)	Max	1.302	1.604	2.106	1.326	1.628	2.131	1.351	1.652	2.155	1.447	1.748	2.251
	Min	0.481	0.587	0.763	0.495	0.601	0.778	0.510	0.616	0.792	0.567	0.673	0.850
Processed Foods (II)	Max	1.375	1.713	2.279	1.380	1.718	2.283	1.385	1.723	2.288	1.488	1.792	2.308
	Min	0.647	0.744	0.906	0.711	0.808	0.971	0.775	0.873	1.035	1.033	1.130	1.292
Beverages & Tobacco (III)	Max	1.647	2.051	2.725	1.655	2.059	2.733	1.663	2.067	2.740	1.694	2.098	2.772
	Min	1.086	1.344	1.773	1.101	1.358	1.787	1.115	1.372	1.801	1.171	1.429	1.858
Construction Materials (V)	Max	1.441	1.739	2.237	1.503	1.801	2.299	1.564	1.863	2.360	1.811	2.110	2.607
	Min	0.941	1.132	1.451	0.985	1.176	1.495	1.024	1.220	1.539	1.155	1.367	1.707
Intermediate Goods I (VI A)	Max	1.333	1.657	2.196	1.343	1.667	2.206	1.353	1.676	2.216	1.517	1.761	2.255
	Min	0.761	0.880	1.077	0.833	0.951	1.149	0.905	1.023	1.221	1.191	1.310	1.508
Intermediate Goods II (VI B)	Max	-32.742	-39.375	-50.484	-34.270	-40.926	-52.016	-35.801	-42.457	-53.547	-41.926	-48.582	-59.672
	Min	0.245	0.137	0.702	0.415	0.306	0.126	0.584	0.476	0.296	1.094	1.146	0.974
Nondurable Consumer Goods (VII)	Max	1.618	1.971	2.560	1.669	2.023	2.611	1.721	2.074	2.662	1.926	2.279	2.868
	Min	0.768	0.905	1.134	0.822	0.960	1.189	0.877	1.014	1.243	1.087	1.233	1.461
Consumer Durables (VIII)	Max	1.639	2.006	2.617	1.681	2.048	2.660	1.724	2.091	2.703	1.935	2.261	2.873
	Min	0.794	0.934	1.168	0.852	0.992	1.227	0.910	1.051	1.285	1.142	1.283	1.517
Machinery (IX)	Max	1.705	2.110	-0.172	1.726	2.131	-0.031	1.747	2.152	2.827	1.831	2.236	2.911
	Min	0.120	0.011	1.266	0.260	0.151	1.357	0.400	0.291	0.107	0.960	0.850	0.667
Transport Equipment (X)	Max	2.298	2.800	3.637	2.370	2.872	3.710	2.442	2.945	3.782	2.731	3.233	4.071
	Min	0.926	1.060	1.285	1.023	1.157	1.382	1.119	1.254	1.478	1.506	1.641	1.866

Note: PL denotes the wage rate and PK the price of capital. The assumptions made about shadow prices are explained in the text.

Table 6.13. *Colombia: Spearman Rank Order Correlation of Incentives and Domestic Resource Costs, 1969*

DRC at		Net Effective Protection						Net Effective Subsidy					
		To Value Added			To Cash Flow			To Value Added			To Cash Flow		
PL	PK	E	D	A	E	D	A	E	D	A	E	D	A
.4	0	-.13	.31	.25	.13	0	-.04	-.13	.21	.16	.08	.01	-.05
.4	1.2	-.11	.55	.62	-.19	.19	.22	-.17	.50	.57	-.13	.16	.22
.4	1.5	-.09	.52	.59	-.19	.18	.21	-.15	.47	.54	-.13	.16	.21
.4	2.0	-.07	.49	.56	-.12	.14	.17	-.13	.44	.51	-.10	.13	.19
.5	0	-.13	.31	.25	.13	0	-.04	-.13	.21	.16	.08	.01	-.05
.5	1.2	-.15	.61	.68	-.19	.20	.23	-.21	.56	.63	-.13	.17	.23
.5	1.5	-.11	.55	.62	-.19	.19	.22	-.17	.50	.57	-.13	.16	.22
.5	2.0	-.14	.46	.52	-.16	.18	.21	-.20	.41	.47	-.14	.16	.22
.6	0	-.13	.31	.25	.13	0	-.04	-.13	.21	.16	.08	.01	-.05
.6	1.2	-.19	.67	.73	-.20	.22	.24	-.25	.61	.68	-.14	.19	.24
.6	1.5	-.13	.60	.67	-.19	.20	.23	-.20	.55	.61	-.13	.17	.22
.6	2.0	-.10	.53	.60	-.19	.19	.22	-.16	.49	.55	-.13	.16	.22
Market Price		-.37	.92	.97	-.18	.29	.29	-.45	.83	.88	-.16	.26	.27

Note: PL denotes the wage rate and PK the price of capital. The assumptions made about shadow prices are explained in the text.

toward comparative advantage would imply an increase in specialization within industry groups as much as the movement of factors between groups.

RESOURCE PULL, COMPARATIVE COSTS, AND SECTORAL GROWTH. An ideal incentive structure is one that encourages resources to move into those activities in which the economy has a comparative advantage. The extent to which this was the case in Colombia in 1969 may be tested by examining the rank order correlation between the various incentive measures and the direct domestic resource cost of foreign exchange. To this end, we have correlated the comparative advantage orderings constructed on the basis of the various shadow prices with the set of net incentive measures, that is, effective protection and effective subsidy to value added and cash flow, for domestic sales and for export sales, all derived by the Balassa formula. We have also included in the correlation the market-priced measure of domestic resource costs.

The resulting Spearman correlation coefficients are shown in Table 6.13. A negative correlation between domestic resource costs and incentive measures would indicate that the sectors in which domestic resource costs were low were the ones that received high net incentive rates. A positive correlation would show that incentives were provided to high-cost activities.

Most of the export incentives are negatively correlated with the domestic resource cost measures, although the coefficients are rather low. There is, however, a positive correlation between the domestic resource cost measure and most of the domestic and average incentive measures. The strongest positive correlation is naturally between market-priced domestic resource cost (Corden effective rate of protection) and the incentive indicators. The positive correlation is weakened by the introduction of shadow prices, but it is not eliminated.

A related issue is the relationship between the level of incentives (that is, resource pull) and the rate of sectoral growth. A careful test of this relationship runs into many difficulties. First, one must choose the period over which growth is to be measured. Under a strategy of import substitution, industries are apt to grow most rapidly when they are first established. To capture this pattern, one should ideally take different periods for different industries.

Whatever the period chosen, the proper incentive to be correlated with the growth of that period is the one in effect at that time. Our measurements of incentives correspond to the year 1969, when many commodities had already completed their domestication process and imports had been replaced by domestic production. Only if incentives had remained unchanged since these sectors had been established could they properly be correlated with sectoral growth rates. Moreover, the response of individual sectors to a given rate of protection may vary.

Another difficulty is that a large part of the incentives come from the licensing system. As already discussed, the price comparisons that underlie our measurement of nominal protection express the net effect of the import restrictions in force in 1969. They will not appropriately indicate the initial inducement to expand output, even on the assumption that import restrictions had remained constant for a long time, since the incentive measure calculated (that is, the ratio of domestic to foreign prices) reflects the economy's cumulative response to incentives over several years.

Hutcheson earlier attempted to relate effective protection rates in 1969 to the growth of output during 1962–69 in all industries and took the above-mentioned difficulties into account as far as possible.[40] The results show that interindustry differences in output growth are explained by rates of effective protection in 1969 and by the share of imports in 1962. Both variables are statistically significant at the 5 percent level, and the coefficient of determination is 0.60 if all other variables are included and 0.57 if they are excluded.

BENEFIT-COST ANALYSIS OF GREATER RESOURCE UTILIZATION IN THE SHORT RUN. The underutilization of capital stock in Colombia was first pointed out by Currie in 1961 and has been more recently documented by Thoumi, FEDESARROLLO, and FICITEC.[41] Although the quoted rates of underutilization vary with the period and the observer, there is little question that capital could have been used more hours a day and more days a year. The potential for obtaining additional capital services from the existing capital stock, combined with the level of unemployment, implies that it would be possible to expand output in many product lines, with the sacrifice of only the leisure of the unemployed and the user cost of capital.

To analyze whether it would be worthwhile to expand production in individual sectors, the relevant question is whether the marginal social cost of the factors falls short of or exceeds the marginal social utility of output. A convenient way of quantifying the answer is to compare the short-run domestic resource cost of foreign exchange with the shadow price of foreign exchange.

Table 6.11 shows the short-run direct domestic resource cost of foreign exchange at different shadow prices and under different assumptions about the user cost of capital. In the overwhelming majority of sectors short-run direct domestic resource costs are below the official exchange rate. Indeed, for all cases in which the shadow price of labor is taken to be less than the market wage, 2 percent of the sectors, at most, have a domestic

resource cost above the official exchange rate. Even when the shadow price of labor is taken to be equal to the market price, no more than 17 percent of the sectors have a short-term DRC above the official exchange rate. Since the shadow price of foreign exchange is above the exchange rate, it is reasonable to conclude that in almost all sectors of the economy the marginal social utility of additional output would have exceeded the marginal social cost of the factors used.

UNDERUTILIZATION OF CAPITAL STOCK IN THE LONG RUN. The rate at which an economy obtains capital services from its capital stock is obviously one dimension of the efficiency with which it uses its savings and is an important determinant of the rate of economic growth. Recent studies on capital utilization have abandoned the traditional definition of excess capacity that measured the shortfall of actual output from the output that entrepreneurs would wish to produce. Instead, these studies have considered the divergence between the rate of utilization that maximizes private profits and the rate that maximizes social welfare. This divergence can be measured in terms of the divergence between market and shadow prices, since evidently entrepreneurs will calculate optimal utilization at market prices, whereas the social optimum will be determined at shadow prices.

Recently developed models of the utilization decision have assumed that owners of capital maximize profits, and have attempted to relate capital utilization to factor pricing.[42] Econometric tests of these models suggest that factor prices do affect capital utilization, although they do not fully explain the divergence between the apparent private and social optimal utilization rates.[43]

For our purposes, the relevant consideration is the effect of government policy on capacity utilization through its effect on factor prices and through incentives to increase utilization rather than to expand the capital stock. In Colombia in 1969 nominal protection on capital goods ranged from 7 to 37 percent for machinery, and it was 115 percent for automobiles and trucks. In comparison, the protection system raised money wages by only 4 percent. These rates imply a relative increase in the price of capital goods, which would encourage their utilization. Since capital goods could frequently be imported free of duty, however, the expansion of the capital stock was encouraged instead.

Furthermore, credit was available more cheaply for fixed capital than for working capital, which gave another incentive to expand capital stock rather than use existing stock more intensively.[44] This was the case particularly for small and medium-size firms, which had to rely largely on loans at high interest rates in the extrabank money market for their working capital needs. Import licensing and credit rationing also tend to promote new investments rather than to increase the utilization of existing stock. Under such a regime, producers are reluctant to postpone purchases or loans, fearing that they may become more difficult or impossible in the future. This factor, too, seems to have been of particular importance for small and medium-size firms.

Policy Recommendations

The preceding analysis of incentives gives rise to several policy recommendations. Although they relate to the period before the mid-1970s, during which coffee prices increased considerably, they are nevertheless relevant to the present situation.

Policy Targets and Their Implications for Policy Design

The main purpose of a reform of the incentive structure should be to realize the potential gains from the reallocation and the increased utilization of resources. In Colombia the domestic resource cost of foreign exchange in the different sectors varies considerably, and hence the potential gains from a reallocation of resources are substantial. At the same time, the marginal social cost of additional production, particularly in the short run, generally falls short of the marginal social utility of the output, and hence welfare gains could also be realized from an increased use of resources.

Improvements in resource allocation require a policy designed to make the direct domestic resource cost of foreign exchange more uniform across sectors. The policy traditionally recommended for this purpose is one of uniform nominal protection. However, uniform nominal protection would provide uniform effective protection only if all sectors, including export sectors, had the same nominal protection—in other words, only under free trade. When one or more sectors are excluded from the uniform protection, effective rates of protection vary among sectors according to the intensity of use of the unprotected inputs. In the case of Colombia, this consideration is especially relevant in view of the low prices of hydrocarbons and competitive energy sources (particularly coal).

Moreover, if market and shadow prices diverge, as they do in Colombia, even equal effective protection at market prices will not guarantee equal domestic resource costs at shadow prices. To achieve this equality, one would need to design a system of effective protection that is nonuniform in market prices and that distinguishes among activities on the basis of their relative factor intensities and the differences between the

shadow and the market prices of the factors of production.

Whenever factors can be substituted for one another, however, trade policy measures are not the best means of offsetting differences between the shadow and the market prices of factors, since they indiscriminately encourage or discourage the use of all factors of production in the protected (or unprotected) industries.[45] Rather, to the extent possible, one should correct distortions in relative factor costs through taxes or subsidies on factor use.

Finally, allocation policy should attempt to equate incentives on export sales with incentives on domestic sales. This objective can be accomplished by a nominal exchange rate suitable for traditional exports combined with import duties and export subsidies for all other sectors; or by a nominal exchange rate suitable for the nontraditional sectors combined with a tax on traditional exports.[46] The former alternative, but not the latter, is subject to countervailing action abroad.

In sum, allocation policy should be composed of an exchange rate suitable for nontraditional exports, combined with a tax on traditional exports, and supplemented by domestic tax and subsidy measures to offset distortions in factor prices.

Utilization policy has the short-run objective of expanding production in all sectors in which the short-run domestic resource cost of foreign exchange is below the shadow price of foreign exchange. In the long run, the utilization gains accrue from a change in relative factor prices that make the intensive utilization of capital more profitable than using additional capital stock.

This short-run policy objective would be served by increasing revenues from sales, particularly from export sales, and by reducing the cost of production, particularly production on additional shifts. For trade policy, it implies across-the-board export subsidies or a compensated devaluation. Domestically, it implies tax reductions or subsidies to lower the cost of labor and whatever user cost of capital is incurred.

Like allocation policy, utilization policy has implications, on the trade side, for the setting of tariffs on capital goods and, on the domestic side, for wage policy as well as for those elements of tax and credit policy that affect the cost of capital. In general, the measures would aim at reducing distortions in product and in factor prices.

The policy requirements of improved resource allocation and long-run factor utilization overlap to a large extent. This is not surprising since the long-run determinants of optimal capital utilization are the same as the long-run determinants of optimal capital intensity (or, more precisely, factor intensity) and resource allocation in production. Further, factor use is affected by distortions not only in factor prices but also in product prices, to the extent that these distortions have differential effects on labor-intensive and capital-intensive activities.

Short-run utilization policy and allocation policy do not overlap to the same degree. A sector's short-run domestic resource costs are lower than its long-run domestic resource costs, however, simply because in measuring short-run DRC capital is regarded as a sunk cost. It follows that the incentives to improve allocation and utilization in the long run will be high enough to increase the use of existing equipment in sectors that would not be profitable in the long run, but not to induce their further expansion. A policy designed to improve resource allocation and utilization in the long run would therefore also have beneficial effects on utilization in the short run.

In addition, increases in the utilization of capital stock and unemployed labor will narrow the gap between the shadow and market prices of labor and capital, and thus reduce the need for differentiation among sectors for allocation policy purposes. There will also be less need for domestic taxes and subsidies to bridge the gap between the shadow and market prices.

In summary, the allocation and utilization goals combined require uniformity in effective protection, both across sectors and between markets, together with a factor price and taxation policy that would offset differences between the shadow and market prices of the factors. In the next two sections, we outline some specific policy proposals based on these principles.

Trade Policy Recommendations

An appropriate policy package would use the exchange rate in place of a substantial part of the trade incentives, replace quantitative restrictions by tariffs, and render effective incentive rates more uniform. In addition, the crawling peg would need to be maintained to avoid fluctuations in real exchange rates. The relevant measures are discussed below.

EXCHANGE RATE POLICY. One would need to continue the crawling peg exchange rate policy and continue devaluing the real exchange rate (adjusted for foreign inflation) in small steps, relying increasingly on the exchange rate in place of protective measures. Such a policy tends to improve resource allocation by rendering incentive rates more uniform in two ways. The scarcity premiums associated with quantitative restrictions are reduced as a consequence of the higher price of foreign exchange, which in part substitutes for the restrictive effect of the quota; and differences in the incentives to domestic sales

and to exports are reduced, in line with the symmetry inherent in exchange rate measures.

Resource utilization will also tend to improve as the result of two effects. The market for Colombian output will grow, partly as the result of the greater competitiveness of Colombian exports, and partly as a consequence of the multiplier effects generated by this growth of exports; and increased export earnings will make available greater amounts of imported inputs, which will allow a more expansionary domestic policy to be pursued and will in turn result in greater resource utilization.

ABOLITION OF IMPORT LICENSES. It would be desirable to abolish the licensing system over a three- to five-year period as the real exchange rate is devalued, and to use tariffs to provide whatever import protection is needed over and above that provided by the exchange rate. The allocative effects would be positive, since measures giving potentially infinite protection would be replaced by measures that give finite and clearly defined protection. Furthermore, the reduction in uncertainty surrounding the level of protection would allow firms to plan more effectively.

While the licenses are being phased out, they can be used to reinforce the price measures designed to promote greater utilization of installed capacity. This effect can be achieved by making eligibility for licenses to import capital goods dependent on the rate of capacity utilization. Thus, firms using their existing capital stock at a low level of intensity would receive no investment allocation except in special circumstances, and firms intending to work more shifts would obtain foreign exchange more easily and quickly than those intending to work fewer shifts.

Utilization rates should not be used as a criterion for the allocation of foreign exchange for raw materials or semimanufactured imports, because the incentives would generate conflicting pressures. Thus, for example, it is not constructive to deny imported inputs to firms that produce at low levels of capacity use, since they obviously need such inputs to increase output and hence capacity use.

TARIFF REFORM. Redundant tariffs do not have a protective function, but provide a cushion that often leads to inefficiency on the part of domestic producers. Thus it seems advisable for Colombia to remove the water from the tariff. Moreover, as the real exchange rate is devalued, it would be desirable to reduce the level of import tariffs and simultaneously to make them more uniform. The reduction in tariffs is necessary to offset the effect of the devaluation on domestic price levels; the move to uniformity can be expected to have significant allocation effects.

Once the compensated devaluation has been accomplished, it would be desirable gradually to reduce import protection even further, timing the reductions to lag slightly behind the growth in exports so that firms will be pulled rather than pushed into exporting.

REFORM OF PLAN VALLEJO. The basic import-export contract arrangement and the license-free nature of imports under the plan would need to be maintained. However, Plan Vallejo imports should not be duty free. Such a modification would remove the differences in the effective protection to exports that arise from variations in the import component of these exports. Indeed, the allocation effects of this greater uniformity would be positive.

Taxing the intermediate inputs imported under Plan Vallejo would eliminate in great part the incentive to use imported goods rather than their domestic equivalents—an incentive that had to be continuously counteracted by diligent administration of the Plan Vallejo. A reduction in administrative costs would therefore be another benefit. Exporters would have unlimited access to imported inputs, and the administration would only be required to ensure that the Plan Vallejo imports were reexported.

DUTY FOR CAPITAL GOODS IMPORTS. Exemptions from import duty for capital goods are costly in terms of allocation as well as of factor utilization. The exemption of capital goods imports from duties has two effects on allocation. First, it leads buyers of these goods to favor foreign over domestic products; second, it tends to increase capital intensity. As for utilization, subsidies on imported capital goods tend to keep the number of shifts lower than it would otherwise be. Elimination of exemptions from import duties should thus contribute to better utilization of the existing capital stock.

Higher taxation of capital goods imports may, however, affect the level of private investment through the reduction in the attendant rate of return. Naturally, the rate of return will not be reduced by the full amount of the increase in price of capital goods, since there will be some substitution to the use of labor and some move toward multiple shifting. The increased cost of capital goods will also imply a reduction in liquidity for the investor, since the increase in cost is incurred at the beginning of the benefit stream. One way of offsetting the reduction in profitability and liquidity resulting from the imposition of duties on capital goods is to earmark the duty collected from this source for industrial development lending so that these funds can be channeled back into the private sector for investment.

Domestic Policy Recommendations

Domestic policy measures would need to be redesigned to work in harmony with the trade policy measures. Domestic tax and credit policies should be modified so that they have a more uniform effect across sectors, and so that they reduce the monetary cost of labor and raise the monetary cost of capital. In this respect, it must be recalled that shadow wages in Colombia are below market wages, the shadow cost of capital goods is above the market price, and the social rate of time preference is below the market interest rate. The specific measures described below would move the Colombian economy in the direction indicated.

INSTITUTION OF DEPRECIATION PROPORTIONAL TO USE. The lack of connection between the rate at which assets are utilized and their fiscal depreciation depresses the after-tax cost of capital. Erosion of the depreciation base through inflation has the contrary effect of raising the after-tax cost of capital. At the same time, there is no guarantee that the two effects offset each other. Also, fiscal depreciation unrelated to use encourages the use of a single shift and the expansion of the capital stock. Indexing the rate of depreciation to the rate at which the assets are used can be expected to yield allocation as well as utilization benefits.

REFORM OF INTEREST RATES. Discrimination in the credit market between credit for the purchase of fixed assets and credit for working capital is a distortion that tends to lower the rate of capital utilization. Instituting equal access to credit, regardless of its purpose, can be expected to increase capacity utilization. Furthermore, positive real interest rates would need to be established. They would permit credit rationing to be phased out and would contribute to increased savings.

UNIFICATION OF PROFIT TAXATION ACROSS ECONOMIC ACTIVITIES. The differentiation of tax rates according to the legal form of business enterprises contributes to inefficiency in the allocation of resources. Such a differentiation might justifiably be used to protect small enterprises, but in Colombia it does not appear to be particularly effective in this regard. Thus the equalization of the tax burden would help improve allocation without having significant equity costs. Taxing agricultural land would also promote greater equity and higher efficiency.

REDUCTION IN TAXATION OF LABOR INCOME. When the supply curve of labor is very flat over an important range at a given real wage, any tax on labor income will be shifted forward and will raise the cost of production by its full extent. Such an effect raises the cost of labor even further above its shadow price. It would be desirable, therefore, to fund social benefits from general tax revenue rather than from payroll taxes.

Notes to Chapter 6

1. Based on the 1972 *World Bank Atlas*, excluding countries with populations of less than 1 million. The ranking depends on the relative prices used. See S. N. Braithwaite, "The Measurement of Latin American Real Income in U.S. Dollars," *Economic Bulletin for Latin America*, vol. 12, no. 2 (1967).
2. Malcolm Gillis and Richard Musgrave (eds.), *Fiscal Reform for Colombia* (Cambridge, Mass.: International Tax Program, 1971), p. 145.
3. International Labour Office, *Hacia el Pleno Empleo* (Bogota: Biblioteca Banco Popular, 1970), p. 22.
4. Ibid., pp. 22, 155–72. See also Miguel Urrutia and Clara Villalba, *El Sector Artesanal en el Desarrollo Colombiano* (Bogota, 1969), p. 3. These authors estimated that in 1966 about half the population subsisted on a per capita income of about US$53. This compares with the national average of US$280.
5. Gillis and Musgrave, *Fiscal Reform for Colombia*, pp. 29–34.
6. For an overview of this strategy, see D. M. Schydlowsky, "Trade Policy in the Economic Growth of Latin America," in *Trade and Investment Policies in the Americas*, ed. S. E. Guisinger (Dallas, Tex.: Southern Methodist University Press, 1973); and A. Hirschman, "The Political Economy of Import-Substituting Industrialization in Latin America," *Quarterly Journal of Economics*, vol. 82 (February 1968).
7. Hernan Jaramillo Ocampo, "Conferencia sobre la Politica Arancelaria del Gobierno," *Introduccion al Arancel de Aduanas* (Bogota: Ministerio de Hacienda, 1950), p. 17.
8. Ministerio de Hacienda, "Memorando sobre el Proyecto de Arancel de Aduanas" (Bogota, 1959), p. 13.
9. "Historia de la Industrializacion en Colombia," *Revista Trimestral de la Asociacion Nacional de Industriales* (Medellin, October 1970), p. 77.
10. Ministerio de Hacienda, "Memorando sobre el Proyecto del Arancel de Aduanas," p. 21.
11. Ibid., pp. 12, 21.
12. Richard Nelson, T. Paul Schultz, and Robert Slighton, *Structural Change in a Developing Economy* (Princeton, N. J.: Princeton University Press, 1971), p. 245. The tariff of 1959 had already increased the level and dispersion of rates in relation to those of 1950. The mean rate in 1950 was 10 percent with a standard deviation of 13.6; by 1959 the mean had increased to 38 percent with a standard deviation of 24.5 (from a sample of 1950 and 1959 tariff schedules).
13. International Labour Office, *Hacia el Pleno Empleo*, p. 50.
14. The only remaining special exchange rate was that for petroleum, which was used to subsidize the domestic consumption of petroleum products, particularly gasoline, to the detriment of production incentives.
15. A cartoon, commenting on the amount of foreign exchange that PROEXPO spent on its promotional activities, shows

a chagrined executive of the organization being interviewed by a reporter who asks, "Aside from dollars, what else have you exported?" On the limitations of PROEXPO export financing, see the section "Components of the Incentive System, 1969."

16. Paradoxically, this policy made a speculative capital inflow very attractive since peso interest rates on savings at 18 to 24 percent appeared high in dollar terms, even though they were strongly negative relative to domestic inflation.

17. One index, designed by Musalem, tabulates the ratio of free imports to total imports. This index stood around 55 percent from 1958 to 1962 and fell as low as 3 percent in 1967, only to rise again in 1968 to 12 percent. See Alberto R. Musalem, "Demand for Money and Balance of Payments: The Experience of Colombia, 1950–67," Economic Development Report, no. 117 (Cambridge, Mass.: Harvard University, June 1970), p. 92.

18. For a detailed description of the import licensing system, see Carlos Diaz-Alejandro, *Foreign Trade Regimes and Economic Development: Colombia* (New York: Columbia University Press, 1976).

19. Musalem, "Demand for Money and Balance of Payments," and J. D. Teigeiro and R. A. Elson, "The Export Promotion System and the Growth of Minor Exports in Colombia," *International Monetary Fund Staff Papers*, no. 37 (Washington, D.C., July 1973), evaluate the cost of advance deposits for imports with differing results, which also differ from ours. The main difference in Musalem appears to be the interest rate used in the calculations. The main difference in Teigeiro and Elson is both the interest rate and the basis on which the total cost is allocated. Whereas Teigeiro and Elson are interested in determining the benefits from the Plan Vallejo exemption to the import requirement, and therefore use the average import intensity of production eligible for exemptions under the plan, our interest is to calculate the tariff equivalent on all imports. This difference implies that the results would be identical only if by accident the percentage of imports on which pre-import deposits were required and the import intensity of Plan Vallejo production were identical. Furthermore, Teigeiro and Elson use an annual interest rate of 14 percent, which appears to be related to the pre-export finance rate. Musalem uses a rate reflecting the annual yield of common stocks on the Bogota stock market plus the rate of inflation (a total of 22 to 25 percent), and we use the domestic bank interest rate of 18 percent, which is more appropriate for normal imports.

20. This result differs significantly from that obtained by Teigeiro and Elson in "Export Promotion System and the Growth of Minor Exports in Colombia," app. A. Therein, the distinction is made between the value of the CAT when held until maturity and its value when sold. This distinction seems to us to assume irrationality on the part of CAT receivers. Surely, no one will hold a CAT if it is worth less to him at maturity than the capitalized value of its present sales price. Likewise, if the CATs obtained by some exporters are worth more to them than they can obtain by selling them on the market, they would buy others in the market, and thus would drive up the market price of the CAT until it is equal to their internal evaluation. Thus the existence of a free market in CATs assures that there can be no divergence between the internal and market value of these instruments. Furthermore, the paper cited holds that when a CAT is sold, the tax benefits accrue to the buyer, and not to the seller who is the original exporter. This reflects a misunderstanding of the system. Under the regulations, the amount obtained from the sale of the CAT is not taxable and thus the seller obtains the tax benefit. The buyer merely uses the CAT to pay his taxes, or if selling it at maturity he benefits by earning an unregulated and free-market interest rate on his money. Finally, the paper cited assumes that the tax benefit is levied on the (tax-exclusive) CAT value, whereas in fact the tax rate must be calculated on the basis of the taxable income rather than on the after-tax yield. These various errors lead Teigeiro and Elson to underestimate the value of the CAT by a significant amount.

21. Alternatively, monopolists or monopolistic competitors may have found that to maximize profits required lower prices and larger volumes.

22. Peter Griffith and Miguel Bermudez, "Comparative Tax Revenues and Burden," in Gillis and Musgrave, *Fiscal Reform for Colombia*.

23. R. N. Slitor, "Reform of the Business Tax Structure," in Gillis and Musgrave, *Fiscal Reform for Colombia*, p. 467.

24. It should be noted that the standard regime described above was modified by exemptions designed to benefit particular sectors. For example, *industrias basicas*, such as users of the steel produced by the national steel corporation Paz del Rio, were entitled to partial tax exemptions for ten years, and industries declared to be new also received tax exemptions.

25. The "tax" in the extra-bank market was distributed according to output in industry and mining; that in the commercial bank market was distributed within industry according to the output of traded goods.

26. Note also that the rate of −7 percent for non-import-competing industries is an average of −10 percent or −8 percent for primary industries and +3 percent or zero percent for manufacturing. Since all import-competing industries were in manufacturing, the disaggregation of indicators reduces the differential but it remains substantial.

27. See, for example, J. Vanek, *Estimating Foreign Resource Needs for Economic Development: Theory, Method, and a Case Study of Colombia* (New York: McGraw-Hill, 1967).

28. For a similar argument, see M. Diamand, *Doctrinas Economicas, Desarrollo e Independencia* (Buenos Aires: Paidos, 1973).

29. N. Kaldor, "Dual Exchange Rates and Economic Development," in *Essays on Economic Policy*, vol. 2 (New York: Norton, 1964).

30. The value of the export incentives is not included in the series because it is difficult to compare measures before and after 1967.

31. Teigeiro and Elson, "Export Promotion System and the Growth of Minor Exports in Colombia." Note 20 above indicates some problems with these authors' measurement of incentives.

32. This means that the inclusion of the variable worsens the fit.

33. Diaz-Alejandro, *Foreign Trade Regimes and Economic Development: Colombia*.

34. Diaz-Alejandro (ibid.) claims that adding 1970 worsens the fit owing to the fall in exports of that year.

35. Diaz-Alejandro cites other elements not captured by the regressions: interaction effects between the policies; credibility of the incentives to exporters; and nonlinearity of the effects of incentives.

36. International Labour Office, *Hacia el Pleno Empleo*, p. 50.

37. F. Thoumi, "Fixed Capital Utilization in Colombian Manufacturing" (Washington, D. C.: World Bank Economic Analysis and Projections Department, April 1975; processed).

38. For a discussion of the appropriateness of this measure, see Bela Balassa and D. M. Schydlowsky, "Effective Tariffs,

Domestic Resource Cost of Foreign Exchange and the Equilibrium Exchange Rate," *Journal of Political Economy*, vol. 76 (May-June 1968); Michael Bruno, "Domestic Resource Cost and Effective Protection: Clarification and Synthesis," *Journal of Political Economy*, vol. 81 (January-February 1972); Bela Balassa and D. M. Schydlowsky, "Domestic Resource Cost and Effective Protection Once Again," *Journal of Political Economy*, vol. 81 (January-February 1972).

39. For a more precise analytical treatment and an algebraic formulation of the transformation of market to shadow prices, see D. M. Schydlowsky, "Project Evaluation in Economies in General Disequilibrium," Discussion Paper, no. 1 (Boston: Boston University Center for Latin-American Development Studies, March 1973); and "Methodology for the Empirical Estimation of Shadow Prices," Discussion Paper, no. 2 (Boston: Boston University Center for Latin American Development Studies, April 1973).

40. Thomas L. Hutcheson, "Incentives for Industrialization in Colombia," Ph.D. dissertation, University of Michigan, Ann Arbor, 1973.

41. Laughlin Currie, "Operation Colombia: An Economic and Social Program" (Bogota: Departamento Nacional de Planeacion, 1961; processed); Thoumi, "Fixed Capital Utilization in Colombian Manufacturing"; Fundacion para la Educacion Superior y el Desarrollo, "Encuesta Industrial," as cited in various issues of *Coyuntura Economica*; and Fundacion para el Fomento de la Inversion Cientifica y Technologica, "Algunas Consideraciones sobre el Papel del Empresario Innovador en la Utilizacion de Capacidad Instalada" (Bogota, May 1976; processed).

42. See, for example, R. Betancourt and C. Clague, "An Economic Analysis of Capital Utilization," *Southern Economic Journal*, vol. 42 (July 1975); and P. Millan, "The Intensive Use of Capital in Industrial Plants: Multiple Shifts as an Economic Option," Ph.D. dissertation, Harvard University, Cambridge, Mass., 1975.

43. See Betancourt and Clague, "Economic Analysis of Capital Utilization"; Millan, "Intensive Use of Capital in Industrial Plants"; and Roberto Abusada-Salah, "A Statistical Shift-Choice Model of Capital Utilization," Discussion Paper, no. 15 (Boston: Boston University Center for Latin American Development Studies, November 1975).

44. See D. M. Schydlowsky, "Influencia del Mercado Financiero sobre la Utilizacion de la Capacidad Instalada," *Desarrollo Economico*, vol. 14 (Buenos Aires) July-September 1974.

45. In this connection it is useful to bear in mind that the shadow price of labor is below its market price, and the shadow price of capital is above or below the market price of value added.

46. The role of compensated devaluation as a tool of transition from one alternative to the other is obvious. For a detailed discussion of compensated devaluation, see D. M. Schydlowsky, "From Import Substitution to Export Promotion for Semi-Grown-Up Industries: A Policy Proposal," *Journal of Development Studies*, vol. 3 (July 1967).

7

Israel

ZVI SUSSMAN

When the State of Israel was established in 1948, the Israeli economy was already well on the road to economic development, with an income level of about US$475 per capita (in 1971 prices) and an industrial structure resembling that of a mature economy more than that of a backward one. Although it is very difficult (and beyond the scope of this study) to date with any degree of accuracy the take-off point of the Israeli economy, before World War II growth in real GNP was 10 percent a year, and in real income per capita was 4 to 5 percent a year.

Development Policy after Statehood

The Period of Controls, 1948–51

After the establishment of the State of Israel, the government made four important decisions concerning the economy in general and development strategy in particular. First was the abolition of all the restrictions on Jewish immigration that had been imposed by the British administration, particularly after 1939. Between May 1, 1948, and the end of 1951, net immigration reached 666,000, corresponding to an annual rate of increase in the population of 24 percent. Second, in areas of the new state that previously had been only sparsely populated—for example, the upper northern and southern districts—both the number of settlements and the population density were to be greatly increased. Meanwhile, the percentage of the population living in Tel Aviv, the most densely populated area, was to be gradually reduced. Third, massive capital formation was to be financed by capital imports. As long as the capital stock increased fast enough to match the increase in the labor force, it was possible to absorb new immigrants without lowering the standard of living of the settled population and without reverting to more primitive production. Fourth, Israel was to lessen its dependence on imports of essential foods and to produce domestically at least 50 percent of all food requirements.

Agriculture was to be developed to permit both the settlement of less populated areas (mainly by newcomers) and the saving of essential imports. Sectoral planning for agriculture was well advanced, investment needs were easy to identify, and there seemed to be no lack of investment projects. In fact, agriculture received the lion's share of public funds provided through the development budgets: 37 percent of all disbursements during this period went to agriculture and only 11 percent to industry. The nominal rate of interest on development loans was 4.5 to 5.5 percent; after adjustments for annual price increases of about 30 percent, real interest rates were strongly negative.

Another tool of investment policy was the granting of the status of "approved enterprise" under the Law for Encouragement of Capital Investment. Approved enter-

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prises received tax exemptions (tax holidays and allowances for accelerated depreciation) and preferential treatment with regard to the allocation of foreign currency (import licenses, repatriation of investments). Whereas the development budget favored mainly agriculture, the status of approved enterprise was granted mainly in industry and partly compensated for the preferential treatment of agriculture in the allocation of public funds.

After the State of Israel was established, the economy faced a serious shortage of foreign currency. During World War II the Jewish sector had accumulated considerable sterling reserves from sales to the British War Supply Board, but when links with the sterling area were severed, the British government froze these balances. Notwithstanding the massive inflow of capital, economic expansion was held back by a balance of payments deficit caused by the financial burden of the Arab-Israeli war, the abolition of restrictions on immigration, and heavy investments by both the private and public sectors. To deal with the deficit, quantitative import controls were tightened and food and clothing rationed. The official rate of exchange remained 0.36 Israeli pounds (I£) to the U.S. dollar until February 1952, however, and import duties and export subsidies were given at rates of 5 percent and 15 percent, respectively.

The larger export subsidy raised the average exchange rate for exports above that for imports. Nevertheless, preference was given to import substitution, since the implied protection given by import quotas was generally much higher than that afforded by import duties or export subsidies. The main features of the import control system were to prohibit or severely restrict imports of what were regarded as nonessential or luxury goods; to permit relatively large imports of investment goods, not only because investments were regarded as essential, but because some large capital inflows were earmarked by the lenders for the import of capital goods; and to limit the importation of raw materials that were not locally produced, as well as raw materials competing with domestic production. Foreign currency from the black market could be used to import goods for which demand exceeded official allocations. In the early 1950s such imports represented 20 to 25 percent of the total.

The expected improvement in the balance of payments did not take place. Increases in prices rendered domestic commodities increasingly uncompetitive so that in 1950 and 1951 exports fell to 14 to 16 percent of imports. Unilateral transfers to Israel and long- and medium-term capital imports fell considerably short of covering the import surplus. Israel's trade deficit was US$281 million in 1950 in comparison with capital imports of US$134 million, and it reached US$360 million in 1951 when capital imports amounted to US$224 million. As a result, the black market rate of foreign exchange rose from I£0.43 to the U.S. dollar in 1949 (20 percent above the official exchange rate) to I£1.55 in 1951 (334 percent above the official rate). On the eve of the devaluation of February 1952, the black market rate was I£2.58 to the U.S. dollar.

Import Substitution, 1952–56

By late 1951 both the inflationary pressures generated by the deficits in the government budgets—temporarily checked by price and wage controls and rationing of essentials—and the increasing shortage of foreign currency forced the government to revise its economic policies. On February 14, 1952, the government announced a "New Economic Policy" that involved lessening the scope of price controls and rationing, reducing aggregate demand, curtailing immigration, and devaluing the Israeli pound through a system of multiple exchange rates, from a rate of I£0.36 to approximately I£1.00 to the dollar. Devaluations continued in subsequent years, and a uniform exchange rate of I£1.80 to the dollar was adopted in 1955.

As a result of the application of the deflationary measures, in 1953 the gross national product stagnated and unemployment reached 11.5 percent of the civilian labor force. In turn, the import surplus was considerably reduced by the decline in imports and the increase in exports, in association with reductions in aggregate demand and the effects of the devaluations. This fact, together with the increase in unilateral transfers (reparations from Germany), reduced the balance of payments deficit to US$20.5 million in 1953 and created a US$93.8 million surplus in 1954.

After 1952 tariffs came into increased use. In addition to being used as a temporary substitute for devaluation between the less frequent formal alterations of the exchange rate, tariffs were raised from an average level of 15 percent in 1952 to 25 percent in 1956. Nevertheless, duties remained largely irrelevant as a means of protection by comparison with import quotas. The latter, incidentally, brought large quota profits to holders of import licenses.[1] One study estimates that even in 1955–56 only about one quarter of total imports subject to duties were limited by these duties, whereas for the remaining three quarters importation was effectively limited by quotas. In addition, a large proportion of what were regarded as noncompetitive imports (such as investment goods) were neither subject to duties nor effectively restricted by quotas.[2] Correspondingly, reliable estimates of effective exchange rates for imports cannot be obtained by adjusting the official exchange rate for tariffs on the output.[3]

In turn, exports received direct subsidies as well as

various other incentives, partly in relation to sales or costs and partly on a discretionary basis. These included import licenses to exporters for domestic sales, low-interest credit, reduced port charges, partial coverage of marketing costs, and in some cases, even the purchase of waste products by the government (such as diamond dust from diamond exporters). Nevertheless, export incentives were apparently much less extensive than the protection afforded by quantitative restrictions of imports.

Although there was no official master plan, the main features of the development strategy followed in the early 1950s may be inferred from the implementation of certain policies. First, there was a considerable reliance on *dirigism* to correct the operation of market forces and determine the path of development. Exchange controls, price and wage controls, rationing, incentives accorded under the Law for the Encouragement of Capital Investments, and the granting of cheap loans for preferred investments, all reflected the dirigiste approach to economic matters. Second, the economic development process was oriented inward, partly in pursuit of a higher degree of self-sufficiency, especially in foods, and partly in reflection of the effort to curtail imports of nonesssential goods. Third, priority was given to absorption of immigrants, most noticeably in the acceleration of the process of capital formation. Investments were subsidized so as to increase the capital stock faster than the increase in the supply of labor, and to maintain a rapid rate of growth that would create a demand for labor in all parts of the economy. There were no tariffs on investment goods, import licenses were readily granted, loans from the development budget were extended at negative real interest rates to all industries, and tax concessions were granted to approved investments. Fourth, the settlement of the less densely populated areas of the country was accorded great importance. This was to be achieved by subsidizing movement from the highly populated to the less populated areas of the country and by encouraging investments in development areas where new immigrants settled, by means of financial incentives to private investments and by the direction of public investments (mainly housing, public services, and transport).

The measures applied to pursue these objectives continued to favor agriculture over manufacturing. As a result, between 1947 and 1955 the share of agriculture in total employment increased from 13 to 15 percent, whereas the share of manufacturing declined from 26.5 to 24 percent. During the same period, total investment in agriculture and irrigation was almost six times as high as investment in manufacturing.

The measures applied reduced the growth of imports. The imports of food and other agricultural products increased between 1952 and 1956 by only 11 percent.[4] Import substitution was not confined to agriculture; in manufacturing, the process of import substitution behind quota protection reduced the ratio of imports to total supply in several industries.[5]

Whereas agriculture as a whole was preferred to manufacturing, there is little evidence that government policies during this period favored certain branches within agriculture or within manufacturing. Although annual production targets were set by the (government-controlled) Joint Agricultural Planning Center for a number of agricultural commodities, it seems that these quotas were effectively enforced for only a small number of products, such as citrus. While private investment plans in manufacturing were subject to government approval, depending on their contribution to the balance of payments and their geographical location, approvals as well as development loans were given rather freely and, by and large, the allocation of investment funds among industries was determined by private entrepreneurs.

To absorb mass immigration, the government maintained its policy of favoring both the inflow of capital and domestic capital formation. At the same time, the subsidization of investment through negative real interest rates provided incentives to the establishment of capital-intensive industries and the use of capital-intensive production methods. An offsetting factor was, however, the policy of population dispersal, which tended to favor investment in agriculture and in labor-intensive industries.

The population dispersal policy led to an increase in the population share of the southern district, covering two thirds of the total area of the country, from less than 1 percent in 1948 to 7 percent in 1957. The growth of the population of other sparsely populated regions, such as the Safad subdistrict in the north and the Ramla subdistrict east of Tel Aviv, also exceeded the rise in the total population of the country. All in all, between 1948 and 1957 the rural population increased almost fourfold while total population roughly doubled, and the share of two major cities, Tel Aviv and Haifa, in the total declined from 55 to 48 percent.

Transition toward Liberalization, 1956–62

Toward the end of the 1950s the government's development policies underwent a number of changes. Since the changes were gradual and were sometimes reversed, it is difficult to pinpoint the exact dates when the government began to dismantle controls, to intervene less directly in the economy, and to rely to a greater extent on market forces. It can be safely stated, however, that whereas before 1956 there were few signs of change

in government policy, after 1962 the government was already well embarked upon liberalizing the economy.

At first, there was a decline in the share of the public sector in capital imports, and in the share of investments financed directly from the government budget. Objective economic criteria such as the domestic resource cost of a dollar saved through import substitution or earned by exports were used more frequently, both in determining the amount of government financing to be provided and in granting the status of approved enterprise. Furthermore, the geographical location of investment became a less important factor in public decisionmaking. Finally, the introduction of index-linked bonds raised real interest rates and increased the role of financial markets.[6]

Important changes also occurred in trade policy. Quantitative restrictions were relaxed and their role was increasingly taken by tariffs. Also, export promotion received increased attention, and less reliance was placed on import substitution.

The process of liberalizing the import quota system began in 1956. As a result, imports resumed their growth, which had been temporarily checked during 1952–54 by the decline in aggregate demand and the tight import controls. Between 1956 and 1961 total imports rose by 70 percent, compared with an increase in GNP of 54 percent.

The rise in exports was much more spectacular. Total exports increased by 179 percent between 1956 and 1961, that is, at an average annual rate of 23 percent, and manufactured exports rose at similar rates. Correspondingly, the share of exports in GNP increased from 9 percent in 1956 to 12 percent in 1961, while the share of manufactured exports in gross industrial output rose from 8.5 to 13 percent. Most of the additional manufactured exports were produced by a small number of newly established export-oriented enterprises.[7]

The rapid expansion of exports was a response to the devaluations undertaken in the first half of the 1950s, the increased export subsidies, and the government preference given to export industries in granting development loans.[8] In February 1956 a uniform export subsidy of I£0.5 per dollar of value added was introduced for the exports of all commodities except diamonds and citrus. This new export subsidy did not replace but augmented existing export incentives that lacked uniformity. These included subsidies on various imported inputs used in export industries (including sea and air transport), the use of export receipts for imports of restricted commodities for sale in the domestic market, subsidized credits, and specific subsidies for exports above the levels of a certain base year.

Subsequently, some of the latter measures declined in importance while others were totally abolished. Toward the end of the 1950s a new export incentive was introduced: so-called branch funds, which subsidized exports of certain commodities in selected industries, financed by self-imposed levies on inputs imported by firms of the branch. Although not strictly a governmental subsidy, the establishment of branch funds was actively encouraged, and the funds themselves were administered by the ministries concerned.

The New Economic Policy, 1962–67

By 1961 the effects of the devaluations of the early 1950s and the subsidies provided to exports were spent. Continued rapid economic growth had become increasingly dependent on the expansion of exports and greater integration into the world market, but the constant official exchange rate maintained between 1955 and 1961 had become progressively more unrealistic in the face of Israel's domestic inflation, which was more rapid than inflation elsewhere.

As part of a new economic policy to make Israeli products more competitive in both domestic and foreign markets, the official rate of exchange was raised from I£1.80 per U.S. dollar to I£3.00 in February 1962. The devaluation was accompanied by reductions in import duties while most existing export subsidies were abolished. The resulting discrimination against exports is apparent from the estimates of effective protection and subsidy for 1965 presented in the next section.

As the effects of the 1962 devaluation wore off, export subsidies were reintroduced in 1966. They were, however, subsequently reduced on the occasion of the November 1967 devaluation, from I£3.00 to I£3.50 per U.S. dollar, which followed the Six Day War. Correspondingly, in 1968 there was again a considerable bias against exports and in favor of import substitution (see the section "Nominal and Effective Protection in Israel, 1965 and 1968").

In the remainder of this section, I shall briefly review the measures of import liberalization and export promotion taken before 1967, the year of the Six Day War. Subsequent changes in the system of incentives are discussed in the concluding section of this chapter, after the presentation of estimates of nominal protection and effective protection, credit and tax incentives, and effective subsidy. Estimates have been made for both 1965 and 1968 to test the consistency of the results.

Along with the 1962 devaluation, the government extended its policy of trade liberalization, aiming at the gradual replacement by tariffs of existing quantitative restrictions on the imports of manufactured goods.[9] Agricultural production remained protected by quantitative import restrictions, as before.

In the first stage of this import liberalization program,

every product was considered separately by a public committee (the Committee for the Protection of Local Industry) and an "appropriate" customs duty was fixed on every item for which imports were liberalized. By 1967, after five years of liberalization, about half the value of manufacturing output was covered by the program. Protection remained unliberalized for agricultural inputs such as machinery, fertilizers, pesticides, certain chemicals and synthetic fibers, and food. Industries that provided services, dyeing, cement, and other building materials, and certain food processing industries such as bakeries, soft drinks, and grain mills were defined as producing nontradeables and were excluded from the liberalization program. Other commodities, such as alarm clocks, car radios, razor blades, matches, newsprint, and batteries, were reviewed by the committee but kept under quantitative controls. Several industries that were regarded as eligible for liberalization had not yet been dealt with by the end of 1967.

The average tariff on imports freed of administrative control came to about 80 percent in 1967, while the effective rate of protection averaged 150 percent. At the same time, the range of both the nominal tariffs and the effective protection rates on liberalized imports was wide. Effective protection rates on clothing, textiles, and electrical and electronic equipment approached 200 percent, for example, while they were less than 100 percent on wood and carpentry, paper and paper products, leather and footwear, nonmetallic mineral products, and basic metals.

The choice of rates of protection on different industries reflected two kinds of considerations. First was the presumed essentiality of a given commodity. Many imported investment goods were not subject to tariffs, since they were regarded as essential to the development of the economy. Consumer durables were subject to high tariffs, since they were regarded as luxuries by the authorities. Second was the competitiveness of an industry. The less competitive a given industry, the higher the protection regarded as necessary for it to survive foreign competition.

These conclusions are supported by the results of Tov's study, which attempts to explain intercommodity differences in tariffs by regression analysis.[10] Among the variables found to be significant and positively related to the degree of potential protection accorded by tariffs were: the price differential between the locally produced and the imported commodity before liberalization; and the domestic resource cost (direct and indirect) of the foreign exchange saved. The uses of the commodity—investment goods, intermediate goods, consumer nondurables, and consumer durables—were also found to be significant.

The second stage of the liberalization process, introduced in November 1966, involved across-the-board tariff reduction on all liberalized commodities. The first reduction of 7 percentage points was followed in October 1968 by a second reduction of 7 percentage points. As noted below, further tariff reductions occurred after 1968.

The subsidy to value added in exports had been abolished with the devaluation of February 1962, along with many of the specific incentives. The only exceptions were: the branch fund for the textile industry; small subsidies to agricultural exports other than citrus, and to textiles; limited tax refunds pertaining to certain expenses or charges, insurance and shipping rates, and some research and development expenditures by exporters; and subsidized export credits, which became increasingly important as export subsidies, both because they rapidly increased in number and because the interest differential widened.

As the effects of the 1962 devaluation wore off, direct export incentives were reintroduced in 1966 in the form of tax rebates that were related to value added. The scope of export subsidization was reduced again, however, in November 1967 when the Israeli pound was devalued from I£3.00 to I£3.50 to the dollar.

In examining changes in the Israeli economy, we have not considered the effects of the territorial changes that followed the 1967 Arab-Israeli war. This seems appropriate since the period covered extends little beyond 1967, and the territorial changes did not have immediate effects on the Israeli economy.

Nominal and Effective Protection in Israel, 1965 and 1968

Many efforts have been made to quantify aspects of protection in Israel. Among them are estimates of effective exchange rates during the 1950s and 1960s, which quantify the various explicit import taxation and export subsidization measures that made up the multiple exchange rate system prevailing in those years. The inadequacy of effective exchange rates as indicators of protection is obvious, however: they indicate the extent of import protection only when imports are not restricted by administrative controls or quotas and when tariffs are not redundant. Moreover, since actual imports were used as weights in estimating the effective exchange rates of a given industry, no account was taken of the potential imports that were kept out by quantitative restrictions and prohibitive tariff rates. The domestic resource cost criterion has been used in Israel since the early 1950s, but mainly for ex ante appraisals of investment projects and to guide decisions on direct export subsidization.[11]

Notwithstanding these efforts, up to now no systematic ex post analysis of Israel's protective system has been undertaken, especially in regard to import substitutes.[12] The main obstacle has been the lack of comparative data on domestic and import prices to indicate the extent of realized protection. This gap has been filled by a project undertaken by the Bank of Israel, which aimed at obtaining all the data, including price ratios, necessary for an analysis of Israel's protective system at two points in time: 1965 and 1968.[13]

Making Price Comparisons

The basic data on domestic production, imports, and exports necessary to calculate rates of protection were provided by the input-output tables for 1965–66 and 1968–69. On the basis of the commodity breakdown of the output data,[14] commodities that accounted for about 80 percent of the output of an individual sector were singled out for further analysis.

At the first stage, the following data were tabulated for each of the 360 commodities thus selected: value of total output at producer prices; value of imports at c.i.f. prices; value of exports at f.o.b. prices; data on import taxation (such as customs, purchase tax differentials, levies or subsidies arising from price equalization funds); data on export subsidization (direct subsidies and subsidies arising from price equalization funds); and data on domestic taxes and subsidies.

At the second stage, the nominal protection rate for each of the 360 commodities was estimated. This was done in one of the three ways described below.

IMPORT-COMPETING INDUSTRIES. If there were substantial imports of the domestically produced commodity and there were no quantitative restrictions, the rate of import tariff was deemed to represent the nominal rate of protection on domestic production. As a rule of thumb, imports were deemed to supply a significant portion of total consumption if the former amounted to more than 10 percent of the latter. This method assumes that locally produced and imported products are homogeneous—an assumption that is not always fully justified, especially in the case of manufactured products. Whenever doubts arose concerning the homogeneity of domestic and imported commodities, inquiries were made as to whether import taxation rates could be used as proxies for price differentials. In some cases, an imported good, though classified under the same heading in the Brussels Tariff Nomenclature as a given locally produced good, was a completely different commodity and had to be treated as such.

For a second category of import-competing commodities, it was not possible to rely on import duties. Although imports comprised more than 10 percent of total availabilities, they were subject to quotas. In such cases, import tariff rates might have been lower than nominal price differentials and might have yielded quota profits for holders of import licenses. For import-competing commodities subject to quotas, the nominal rate of protection was thus estimated on the basis of price comparisons between domestic products and imports. For these, information on prices submitted to the Public Committee for the Protection of Local Industry (set up to advise the Ministry of Commerce and Industry on import liberalization) was used whenever available. Otherwise, information on domestic and foreign prices was collected from producers and traders.

EXPORT INDUSTRIES. In export industries, imports supplied less than 10 percent of domestic consumption. For commodities whose exports exceeded I£1 million a year, exporting firms were requested to provide information on domestic and f.o.b. export prices, and nominal protection rates for exports were calculated on the basis of these prices. In several industries, both agricultural and manufacturing, the collection of data was made easier by the existence of trading firms that undertook foreign marketing on behalf of producers.

NON-IMPORT-COMPETING INDUSTRIES. In the case of commodities for which neither imports nor exports were significant, since they represent less than 10 percent of domestic consumption and production, respectively, nominal rates of protection were taken as the ratio of the exfactory price of the domestic product to the c.i.f. price of the equivalent importable product. For agricultural products, data on domestic prices were available from the Central Bureau of Statistics and the various marketing boards dealing with agricultural products. Information on prices of potential imports was obtained from published international statistics and officials of the Ministry of Agriculture.

For manufactured goods, the main sources of information on the prices of both domestic products and potential imports were Ministry of Trade and Industry officials dealing with specific industries or commodities, who had at their disposal price data collected in connection with the import liberalization program. Governmental sources were less well informed on commodities that continued to enjoy administrative protection than they were on liberalized products, and data on domestic and on import prices were collected from producers and traders or from foreign producers. These prices and the resulting price differentials were then checked with the help of Ministry of Trade and Industry officials.

Whenever a single item was thought to represent one

Table 7.1. *Israel: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1965 and 1968*
(percent)

	1965					
	Nominal Protection			Effective Protection (Balassa)		
	E	D	A	E	D	A
Agriculture, Forestry & Fishing (I)	5	21	17	8	41	32
Mining and Energy (IV)	2	5	3	-1	2	0
Primary Activities (I+IV)	4	21	16	6	39	29
Processed Foods (II)	1	38	31	-4	169	120
Beverages and Tobacco (III)	-	36	36	-	137	137
Construction Materials (V)	0	13	12	-8	12	11
Intermediate Products I (VIA)	45	48	48	133	92	96
Intermediate Products II (VIB)	2	37	34	-10	69	63
Nondurable Consumer Goods (VII)	24	68	63	0	112	98
Consumer Durables (VIII)	-	57	57	-	77	77
Machinery (IX)	0	35	34	-12	39	37
Transport Equipment (X)	-	58	58	-	115	115
Diamonds (XI)	1	-	1	4	-	4
Manufacturing (II, III, V-XI)	9	44	36	16	82	71
All Industries (I-XI)	8	39	31	11	67	55

of the 360 commodities covered, the price comparison was made for this single item. For other commodities, a number of price comparisons for different items were made, and an average of price ratios was calculated, using the world market value of output as weights.

Nominal Rates of Protection for Domestic Sales

THE STRUCTURE OF NOMINAL PROTECTION RATES. Nominal protection rates on production for the domestic market, on a three-digit industry basis, are presented in Appendix Table 7.1 for the year 1968; the corresponding data for 1965 are available from the author. Table 7.1 presents these rates aggregated into ten industry groups, and Table 7.2 aggregates the industry groups into four trade categories, for both 1965 and 1968.

The main characteristics of the structure of nominal protection—which escalated from lower to higher degrees of processing—can be inferred from the ten-industry-group classification: relatively low rates of protection applied to primary production and construction materials; rates were higher on intermediate goods, and again higher on nondurable and durable consumer goods. The escalation of nominal protection rates is also apparent if the rates are aggregated according to final and intermediate uses and, within final uses, according to consumption and investment goods (Table 7.3); the relatively low rates on the latter are explained by the use of investment goods as inputs.

As can be seen from Table 7.2, in 1968 the average rates of nominal protection on domestic sales in the four trade categories were rather similar, though highest on the domestic sales of export industries within each trade category. Also, nominal rates of protection were generally higher on manufacturing than on primary activities.

Nominal protection rates changed little between 1965 and 1968, with an increase in the average nominal protection on domestic sales from 39 to 40 percent. Although the process of replacing quantitative restrictions by tariffs continued, progress was relatively slow in 1966 and 1967 owing to the recession and to the disruption caused by the Six Day War. The tariffs actually imposed on the commodities that came up for consideration under the liberalization scheme were, on the average, higher in 1966 and 1967 than in previous years.

COMPETING IMPORTS AND PROTECTED INDUSTRIES. A first impression of the extent to which production for the domestic market was exposed to foreign competition can be gathered by dividing tradeable commodities produced domestically and sold in the domestic market according to whether they competed with imports or not, and by dividing commodity imports according to whether they competed with domestic products or not.[15]

The share of domestic production in total availabilities was larger than that of imports in both 1965 and 1968, as shown in the comparison of domestic sales of

1965			1968								
Effective Subsidy (Balassa)			Nominal Protection			Effective Protection (Balassa)			Effective Subsidy (Balassa)		
E	D	A	E	D	A	E	D	A	E	D	A
15	44	36	13	27	23	26	58	48	22	56	45
-6	-3	-5	12	19	14	16	24	18	25	33	27
10	42	32	13	26	22	24	56	45	22	54	43
-8	169	119	11	39	31	8	267	151	16	258	149
-	133	133	12	33	33	64	92	91	72	101	100
-14	8	7	-	13	13	-	16	16	-	24	24
136	94	98	43	43	43	128	86	92	115	83	87
-12	66	61	11	38	35	21	80	74	11	77	70
-5	108	93	23	73	61	8	128	95	13	133	100
-	72	72	10	57	55	-8	109	104	-2	114	110
-17	33	32	10	18	18	3	16	15	11	25	24
-	110	110	-	57	57	-	188	188	-	181	181
8	-	8	1	-	1	0	-	0	2	-	2
17	79	69	10	44	34	16	90	71	17	91	72
14	67	55	11	40	31	19	79	62	19	79	62

competing and noncompeting tradeable commodities (in Israeli pounds):

	Domestic products		*Imports*		*Total domestic availabilities*	
	1965	*1968*	*1965*	*1968*	*1965*	*1968*
Competing commodities	1,169	1,614	834	1,175	2,003	2,789
Noncompeting commodities	3,222	4,090	2,154	3,428	5,376	7,518
Total	4,391	5,704	2,988	4,603	7,379	10,307

At the same time, there was relatively little competition between domestically produced and imported goods. In 1968, 74 percent of imports were noncompeting imports, and 72 percent of domestic production sold on the local market did not compete with imports. Overall, only 27 percent of the total supply of tradeable goods was made up of commodities in which domestic and foreign supply actually competed with one another.[16] This raises the question of whether the relatively small degree of competition between domestic products and imports was due to natural advantages of domestic production or to the protection of domestic industries, either by prohibitive tariffs or by quantitative restrictions.

To assess the importance of protection in excluding competitive imports, domestic products sold in domestic markets may be classified according to whether they were protected or unprotected. Unprotected domestic products include products that competed with imports but were not protected either by tariffs or by quantitative restrictions, and products that did not compete with imports and were sold at a price equal to or lower than the c.i.f. price of potential imports. In turn, protected domestic products include products that competed with imports but were subject to tariffs or quantitative restrictions, and products that did not compete with imports but were sold at a price higher than the c.i.f. price of potential imports, owing to protection.

According to these definitions, 87 percent of all domestic industries producing for the domestic market in 1968 were protected, while the remaining 13 percent were unprotected (Table 7.4). In 1968 protected industries accounted for 86 percent of the production for domestic sales not competing with imports.

To examine whether the protected industries were able to keep out imports because of their low production costs, and not because protection covered up their inefficiency, some information is needed on the relation between domestic and foreign prices for protected industries. Among the protected industries not competing with imports, it was found that the price differential was less than 30 percent for only ten out of eighty three-digit industries in the classification scheme of the Central Statistical Bureau.[17]

Among the ten industries, six may be classified as protected and efficient: cotton, fruit and vegetable can-

Table 7.2. *Israel: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1965 and 1968*
(percent)

	1965					
	Nominal Protection			Effective Protection (Balassa)		
	E	D	A	E	D	A
Export Industries	5	38	18	5	42	22
Traditional	1	0	1	2	-1	1
Nontraditional	17	43	35	13	51	39
Primary	1	4	2	0	4	2
Traditional	0	0	0	1	-1	0
Nontraditional	2	5	4	-1	6	4
Manufacturing	7	60	26	12	100	51
Traditional	1	-	1	4	-	4
Nontraditional	24	60	49	25	100	76
Export-and-Import-Competing Industries	20	43	40	42	99	91
Primary	29	19	21	54	26	31
Manufacturing	20	45	42	42	111	102
Importing-Competing Industries	-	42	42	-	78	78
Primary	-	24	24	-	34	34
Manufacturing	-	45	45	-	93	93
Non-Import-Competing Industries	36	34	34	112	61	61
Primary	80	30	71	3,139	83	88
Manufacturing	0	36	35	-8	50	49
All Industries	8	39	31	11	67	55
Traditional	1	0	1	2	-1	1
Nontraditional	19	39	37	25	70	65
Primary	4	21	16	6	39	29
Traditional	0	0	0	1	-1	0
Nontraditional	14	23	21	19	44	42
Manufacturing	9	44	36	16	82	71
Traditional	1	-	1	4	-	4
Nontraditional	21	44	42	28	82	77

Note: Apart from the export industries category, where citrus and diamonds have been classified as traditional primary and traditional manu-

1965			1968								
Effective Subsidy (Balassa)			Nominal Protection			Effective Protection (Balassa)			Effective Subsidy (Balassa)		
E	D	A	E	D	A	E	D	A	E	D	A
8	42	24	8	80	20	15	68	35	16	67	35
7	2	6	4	13	4	12	24	13	11	22	13
9	50	39	21	46	39	24	78	58	28	78	59
5	6	5	13	8	11	23	13	19	22	11	17
8	2	4	12	13	12	24	24	24	20	22	21
-4	8	6	14	6	9	22	7	12	27	6	13
13	77	51	7	70	24	8	142	51	11	143	53
8	-	8	0	-	0	0	-	0	2	-	2
20	97	73	23	70	51	25	142	94	29	143	96
107	60	61	22	41	37	41	109	93	37	109	92
-3,133	86	93	13	11	11	45	31	33	42	29	31
-12	47	46	23	44	39	43	122	102	38	122	101
43	98	91	10	38	38	2	81	80	-9	82	81
61	29	36	-	28	28	-	45	45	-	44	44
42	110	110	10	39	39	2	89	88	-9	90	89
-92	76	76	10	36	36	42	70	70	37	70	70
-	37	37	15	38	37	33	103	101	29	100	99
-92	89	89	9	36	35	52	54	54	46	55	55
14	67	55	10	40	31	19	79	62	19	79	62
8	2	6	4	13	4	12	24	13	11	22	13
23	69	65	21	40	37	31	82	74	31	82	74
10	42	32	13	26	22	24	56	45	22	54	43
8	2	4	12	13	12	24	24	24	20	22	21
17	47	45	14	27	25	23	60	55	28	58	54
17	79	69	10	44	34	16	90	71	17	91	72
8	-	8	0	-	0	0	-	0	2	-	2
26	79	74	22	44	40	34	90	82	33	91	82

facturing exports, respectively, all other productive activities have been classified as nontraditional.

Table 7.3. *Israel: Nominal Protection on Domestic Sales—Final Uses and Consumption Goods, 1965*
(percent)

	Intermediate Goods (1)	Investment Goods (2)	Final Uses (1)+(2)	Consumption Goods (4)	Total (5)
Agriculture	26	-	26	13	19
Food, Beverages, Tobacco	44	-	44	24	38
Textiles, Leather	68	-	68	51	58
Light Industries	52	35	48	16	22
Chemicals, Minerals	65	13	63	23	25
Metal Industries	96	27	35	36	31
Total	47	27	41	23	30
Domestic output a/	44	43	44	33	38
Imports b/	70	19	35	14	20

Note: Individual rates weighted according to total availabilities of each type of good, except for last two rows.
a/ Individual rates weighted according to domestic output of each type of good.
b/ Individual rates weighted according to imports of each type of good.

ning, clay and lime, diamonds, tinware and other fabricated metal products (mainly containers, boilers), and structural metal products. Three industries—margarine and oil products, oil distilling, and wine industries—process subsidized raw materials, and therefore were probably less efficient than their low price differentials suggest. This leaves one industry—manufacture of agricultural machinery—with an unexplained low price differential of 2 percent, which becomes even more puzzling in view of the fact that imports of agricultural machinery were subject to quantitative restrictions.

For the other 79 percent of protected commodities not competing with imports, price comparisons show a differential of more than 30 percent. The average price differential for all commodities not competing with imports was 49 percent, compared with an average of 28 percent for protected commodities competing with imports and for unprotected commodities. Thus, the results do not support the hypothesis that the group of protected commodities not facing imports was able to prevent imports because of its low production costs. In addition, the 30 percent price differential is below the 49 percent overvaluation of the exchange rate estimated for 1965, so that the costs of efficient industries in fact exceeded those shown above (see Appendix Table 7.1).

The degree of competition between domestically produced and imported commodities varied greatly among the main industry groups, as seen from Table 7.4. In agriculture, food processing, and metal industries, commodities in which domestic and foreign sources were competing accounted for a large fraction of total supply. In the textiles, leather, mineral, and chemical industries, only a small part of total supply was made up of domestic products competing with imports, and competing imports were of little importance. As for the light industries, only a small part of total availabilities was supplied by competing commodities. In all industries except agriculture, more than 85 percent of domestic output sold domestically was protected. Table 7.4 indicates that changes in the degree of competitiveness from 1965 to 1968 were slight.

Nominal Rates of Protection for Exports

Nominal protection rates on exports are shown in Appendix Table 7.1 and in Tables 7.1 and 7.2, which

Table 7.4. *Israel: Indicators of Competitiveness and Extent of Protection, 1965 and 1968*
(percent)

	Domestic Products Competing with Imports as Share of Total Domestic Availabilities		Competing Imports as Share of Total Imports		Competing Products as Share of Total Domestic Availabilities		Protected Domestic Products as Share of Total Domestic Availabilities		Protected Domestic Products, not Competing with Imports, as Share of Total Domestic Availabilities not Competing with Imports	
	1965	1968	1965	1968	1965	1968	1965	1968	1965	1968
Agriculture	24	33	65	83	36	46	59	61	46	68
Food, Beverages, Tobacco	29	28	52	52	36	36	93	94	90	92
Textiles, Leather	13	16	43	21	17	17	100	100	100	100
Light Industries	34	27	5	3	16	11	98	98	98	97
Minerals, Chemicals	8	9	6	4	7	6	87	90	86	89
Metal Industries	48	47	29	50	38	48	89	88	80	78
Average	27	28	28	26	27	28	86	87	81	86

Table 7.5. *Israel: Nominal and Effective Protection on Exports of Industries Exporting More than 10 Percent of Their Output, 1965 and 1968*
(percent)

	Share in Total Exports 1965	Nominal Protection Rates						Effective Protection Rates					
		Domestic Sales		Exports		Total Sales		Domestic Sales		Exports		Total Sales	
		1965	1968	1965	1968	1965	1968	1965	1968	1965	1968	1965	1968
Exporting at least 50 Percent of Output													
Citrus and Citrus Products	20	0	13	0	13	0	12	-1	24	-2	23	0	24
Diamonds	34	-	-	1	1	1	1	-	-	4	0	4	0
Minerals (Potash, Phosphates)	5	0	12	2	12	2	12	-6	13	-1	16	-3	15
Total	59	0	13	1	5	1	6	-1	22	0	12	0	14
Exporting 10-50 Percent of Output													
Agricultural Products	2	28	23	18	17	25	22	42	58	34	51	40	57
Textiles, Outerwear	13	68	78	40	38	62	65	31	58	85	61	23	28
Plywood	3	45	31	49	41	46	34	47	48	62	89	52	59
Other Industrial Products	8	24	31	1	18	20	26	67	88	-1	10	54	71
Total	26	46	48	26	26	42	42	90	109	43	44	80	91

express export subsidies as a percentage of the value of exports on a three-digit-industry basis, aggregated into industry groups and trade categories. Nominal protection rates on exports were relatively low: an average of 8 percent on all exports of commodities in 1965 compared with 39 percent on domestic sales. The average nominal protection rate is misleading, however, since it combines the very low nominal protection rates on most export commodities with the higher rates of protection on a small number of products.

The nominal rates of protection on citrus and citrus products, diamonds, and minerals, which accounted for about 60 percent of all exports of goods, were very low in 1965 (Table 7.5). It appears to have been assumed that export subsidies would not increase total foreign currency receipts, either because elasticities of domestic supply and foreign demand were low, as they were for citrus and diamonds, or because the government controlled the investment decisions of government-owned corporations, as it did for minerals. The average nominal protection rate for exports other than citrus, diamonds, and minerals was 26 percent in 1965. Among the export industries enjoying relatively high nominal protection in that year were agricultural exports excluding citrus (18 percent), textiles (40 percent), and plywood (49 percent).

Table 7.5 also shows the differences in nominal protection rates on domestic sales among export industries. The main export industries received no protection on their domestic sales, whereas industries exporting less than 50 percent but more than 10 percent of their output had an average protection rate of 46 percent.

From Table 7.2, it is apparent that the nominal protection on exports was relatively low in the export industries (5 percent) and considerably higher in export-and-import-competing industries (20 percent), among which were most of the industries that exported between 10 and 50 percent of their output.

Between 1965 and 1968 two major changes were made in the system of export subsidies. First, export subsidies were increased in 1966 and, despite subsequent reductions in conjunction with the devaluation undertaken in November 1967, they remained above the 1965 level in 1968; average nominal rates of protection on all exports were 8 percent in export industries and 10 percent in all industries taken together. Second, export subsidies became more uniform. The complicated system of indirect subsidies in the form of tax rebates, partial reimbursement of shipping, insurance, and handling costs, grants for the development of export markets, and so forth, declined in importance once direct export subsidies on total export sales, calculated according to value added groups, had been introduced in 1966.

The average rate of nominal protection on the main export industries increased from 1 to 5 percent as citrus and citrus products and minerals became eligible for the value added subsidy (Table 7.5). In turn, the average nominal rate for nontraditional export industries increased from 17 to 21 percent, and that for export-and-import-competing industries from 20 to 22 percent (Table 7.2). The latter change was due to two opposite influences: the rates on export industries enjoying relatively high nominal protection decreased, and the rates on those with relatively low protection increased.

Nominal Rates of Protection for Total Sales

Comparison of the nominal rates of protection for domestic and for export sales reveals a considerable bias in favor of domestic markets and against export markets. The overall averages were 8 and 39 percent, respectively, in 1965 and 11 and 40 percent in 1968 (Table 7.1). It appears, then, that the extent of this bias changed little between the two years. A continuing bias against exports was apparent in primary activities and in manufacturing as well.

Effective Protection Rates

The input-output table of the Bank of Israel for 1965 and that of the Central Bureau of Statistics for 1968 provide data on the value of purchases of domestic and imported inputs by each sector.[18] The input-output tables also give information on the taxes and subsidies on domestic and imported inputs. The tables, in their most detailed form, comprise 169 sectors including services. This necessitated averaging nominal rates of protection for the products and for the inputs of the individual sectors. Input protection rates have been derived for each cell of the input-output matrix.

The estimates of effective protection rates presented here are based on the Balassa method, which assumes that nontraded inputs are in infinitely elastic supply and adjusts for the protection of tradeable inputs. Adjustments were made for cases in which a nontraded input was specific to a particular industry (and therefore its supply elasticity to that industry was probably quite low), and for cases in which such a nontraded input made up a large share of the total inputs to the industry. These adjustments were made for the following industries: sugar beet inputs into sugar; fodder inputs into cattle and sheep farming; milk inputs into the milk products sector (cheese, butter); certain grain and mill products purchased by livestock farmers; inputs purchased by textile branches from the textile-finishing sector (dyeing and bleaching, for example); and metal coating purchased by the domestic and commercial machinery industry. The correction was done by the Corden method. The protection of domestic value added in the

branches listed above was estimated after including the value added in the production of the inputs in question. All other nontraded inputs were considered to have been supplied at constant costs.[19]

The estimates of effective protection rates pertain to industries producing tradeable goods. Excluded are: trade and services, building, water and electricity; sectors in which output was akin to services (such as preparation of meat for sale, publishing, printing—since this is mainly in Hebrew—and textile finishing); and products that are perishable or have relatively high transport costs and thus are not generally traded internationally, such as milk, sugar beets, fodder, bakery products, and quarried stone.

Effective protection rates on production for exports and for the domestic market are presented on a three-digit industry basis in Appendix Table 7.1. Table 7.1 presents the rates aggregated into ten industry groups and Table 7.2 shows the rates aggregated into four trade categories. These rates are summarized here for 1965 and 1968:

	1965			*1968*		
	Nominal protection		*Effective protection (Balassa method)*	*Nominal protection*		*Effective protection (Balassa method)*
	Outputs	*Inputs*		*Outputs*	*Inputs*	
Export sales	8	6	11	11	7	19
Domestic sales	39	22	67	40	19	79
Total sales	31	18	55	31	15	62

Spearman rank correlation coefficients between nominal and effective rates of protection estimated to be 0.80 in 1965 and 0.84 in 1968 indicate a close but far from complete correspondence between the two indicators. This conclusion is confirmed by estimating the statistical relationship between nominal (*NPR*) and effective (*EPR*) protection rates (*t* values in parentheses):

$$EPR = \underset{(-3.401)}{-174.253} + \underset{(7.546)}{2.749}NPR. \qquad R^2 = 0.415$$

In an eighty-industry breakdown, the nominal rates alone explain less than half the total variance of the effective rates.[20]

Given the cascading nature of the Israeli tariff structure, effective rates of protection on domestic sales were generally higher than nominal rates. The same result obtains in a comparison of the nominal and effective rates on export sales.

The bias in the system of protection against exports, already apparent from the nominal rates, is even more pronounced in the effective rates. Thus, average effective rates of protection on exports were 11 percent in 1965 and 19 percent in 1968, in contrast to effective rates on domestic sales of 67 and 79 percent in the two years, respectively (Table 7.1). In the ten-industry breakdown, only the intermediate products I category showed effective rates on exports higher than on domestic sales. This reflects the high subsidies given to exports of cotton, woolen, and synthetic yarns. For cotton yarn, effective protection rates were 340 percent for exports and 206 percent for domestic sales in 1968, while for woolen and synthetic yarns the comparable rates were 233 and 180 percent.[21] Since these commodities are included in the export-and-import-competing category, the latter shows relatively high effective rates of protection on exports. This category also had the highest average rates of effective protection on total sales (93 percent in 1968), followed by import-competing industries (80 percent), non-import-competing industries (70 percent), and export industries (35 percent) (Table 7.2).

On a disaggregated basis, ten industries in 1965 had effective protection rates higher than 300 percent (Appendix Table 7.1). These industries, in decreasing order of the effective protection received, were: sugar (negative value added); milk products (1,470 percent); paints and lacquers (550 percent); wire and wire products (396 percent); cotton yarns (340 percent); office and school supplies (349 percent); cutlery and hand tools (315 percent); products for pest control (314 percent); pharmaceuticals (307 percent); and plastics (304 percent). By 1968, with three exceptions (sugar, milk products, and products for pest control), all these industries had effective rates of protection lower than 300 percent. In contrast, protection increased for three industries that in 1965 had rates of protection lower than 300 percent: meat (750 percent), when domestic prices were maintained during a temporary fall in world market prices; radio and television sets (347 percent), owing to the start of assembly of television sets; and basic steel (301 percent), which changed slightly from 279 percent in 1965.

The average effective protection rate on domestic sales increased from 67 percent in 1965 to 79 percent in 1968, while the average nominal rate on domestic sales increased from 39 to 40 percent (Table 7.1). Decreases in the nominal protection of domestic sales led to lower effective rates for beverages and tobacco, intermediate products I, and machinery in 1968. Average effective rates on exports increased from 11 percent in 1966 to 19 percent in 1968, largely because nominal rates rose from 8 to 11 percent. Apart from intermediate products I and diamonds, where lower nominal rates of protection on the output and on inputs, respectively, lowered the effective protection of exports, increases in export protection were fairly uniform across categories.

Factors Explaining the Differences in Protection Rates among Industries

It may now be asked whether the substantial interindustry differences in effective rates of protection were the result of consistent government policy based on objective criteria, or of a large number of unrelated decisions. Among the factors that might be expected to shape government decisions on protection are: the need to encourage exporters, the infant industry argument, the tradition of a cascading tariff structure, factor protection policies, and the influence of pressure groups.

PROTECTION OF DOMESTIC SALES AS A REWARD FOR EXPORTS. The encouragement of exports by means other than direct export subsidies has been one of the main features of Israeli government policy since 1948. It is plausible to assume that the protection of the domestic market was used for this end. Although raising the level of protection for a given industry in the domestic market makes domestic sales more profitable in relation to exporting, making such protection conditional on export performance would provide incentives to increase exports. At one time it was officially pronounced that large investments were to be encouraged in the protected domestic market in order to create excess capacity, which would in turn be used to produce exports for sale at prices covering only short-run marginal costs.[22]

At first sight, the effective protection rates on the domestic sales of export industries and of export-and-import-competing industries in manufacturing shown in Table 7.2 appear consistent with such a policy. Thus, in 1968 effective protection rates on the domestic sales of these two categories of industries were 142 and 122 percent, respectively, compared with effective protection rates of 89 and 54 percent on the domestic sales of import-competing and non-import-competing industries. Owing to the great dispersion of effective protection rates, however, a comparison of *average* protection rates for broad categories of industries may be misleading. Therefore, the hypothesis that effective protection rates on domestic sales will be high for industries exporting part of their output and low for industries not exporting at all or exporting only small quantities has been tested on a disaggregated basis.

Effective protection rates for domestic sales (EPR_d) have been regressed on the share of production exported (E/O), excluding industries exporting all or almost all their output. Tests of the degree of association (chi square) have been performed for industries having high protection in the domestic market (more than 160 percent) and exporting a large share (from 10 to 50 percent) of production, and also for industries having low protection in the domestic market (less than 160 percent) and exporting less than 10 percent of their production.

The regression results, with t values in parentheses, show that the export share variable is not statistically significant and explains none of the variation of effective protection rates on domestic sales:

$$EPR_d = \underset{(8.64)}{2.37} + \underset{(0.10)}{2.40}E/O. \qquad R^2 = -0.014$$

The chi-square test gave the same results: The effective protection rates on domestic sales did not differ significantly between high export share and low export share industries. Thus, the hypothesis had to be rejected.

Effective protection rates on sales in the domestic market were compared with those on export sales in individual exported industries. From Table 7.5, it is apparent that in industries that exported most of their output (citrus and citrus products, diamonds, and minerals), domestic and export sales were practically unprotected in 1965. Nominal and effective protection rates for this group, which accounted for about 60 percent of exports of goods, were only slightly higher in 1968.

Export protection rates were negligible also in a second group of industries, which accounted for about 6 percent of exports of goods, in which exports were less than 10 percent of total sales. These industries enjoyed varying degrees of protection on their domestic sales.

In a third group of industries for which foreign markets were an important but not the dominant outlet and exports accounted for 10 to 50 percent of output, a small number of export commodities enjoyed relatively high export subsidies. This group of industries contributed 26 percent of Israel's merchandise exports. The average effective protection rate on the exports of this third group of industries reached 43 percent in 1965 (44 percent in 1968); in turn, effective protection on its domestic sales was 90 percent in 1965 and 109 percent in 1968.

For further investigation, industries exporting 10 to 50 percent of their output were divided according to the degree of monopoly in the domestic market. From Table 7.6, it appears that industries that were monopolies in the domestic market were granted relatively high effective protection on domestic sales and low effective protection on exports. This fact did not prevent them from exporting part of their output, since price discrimination between the two markets would maximize their profits, provided that domestic demand was less elastic than foreign demand. For cartelized industries, the price policy with regard to foreign and domestic markets and the division of outputs between the two markets resulted from a joint cartel-government agreement, implemented through government controls. The producer received a uniform pool price for his output, which was correlated

Table 7.6. *Israel: Protection of Industries Exporting 10–50 Percent of Their Output, according to Degree of Competition in the Domestic Market, 1968*
(percent)

Degree of Competition	Nominal Protection		Effective Protection	
	Domestic Sales	Exports	Domestic Sales	Exports
1. Monopolies	47	12	137	19
2. Competitive Industries	62	30	107	34
3. All Cartels	25	31	91	113
3a. Cartels: Centralized	23	17	58	51
3b. Cartels: Individual Exporters	26	36	122	170
Average	48	26	109	44

1. Includes paper and cardboard (251); tires (281); basic chemicals (290); glass and glass products (301); asbestos (309).
2. Includes woolen and synthetic yarns; synthetic fabrics (221, 222); woolen and cotton fabrics (223); knitted fabrics and products (225); outerwear (230); tubes and pipes of iron and steel (323).
3a. Includes cotton fibers, seeds (15); groundnuts (16); bananas (54).
3b. Includes vegetable oil, oil cakes (217); cotton yarns (220); plywood (240).

with the actual allocation of total output between local and foreign markets, and customarily exceeded the export price.

In Table 7.6 the cartelized industries have been subdivided into (1) centralized cartels for agricultural products, where all the output of the individual producers was purchased at a fixed price by a central marketing board that then allocated the output between the domestic and foreign markets; and (2) cartels of individual exporters of industrial commodities, which determined the price (to the buyer) at which the product was sold in each of the two markets. Each producer decided on the allocation of his output between the two markets. A special industry fund reimbursed a producer for the difference between domestic and export prices, out of revenue collected from the members of the cartel according to their purchase of a specific input, or on some other basis.

Centralized cartels were theoretically in the same position as monopolies with regard to the use of price discrimination between domestic and export markets. In fact, however, the domestic prices charged by the centralized cartel were on the average only slightly higher than prices charged in export markets, with nominal protection rates of 17 percent for exports and 23 percent for domestic sales in 1968. Effective protection rates were considerably higher but still very close: 51 and 58 percent, respectively. The average, however, conceals considerable diversity among the three cartels; domestic prices were much higher than export prices for groundnuts and bananas, while the opposite was the case for cotton fibers, the major domestic input of the textile industry, which enjoyed preferential treatment by the government.

Although the cartels of individual exporters enjoyed nominal protection rates in the domestic market that were similar to those of centralized cartels, their effective protection rates, at 122 percent, were substantially higher than those of the latter. In the cartels of individual exporters, nominal protection rates and, even more so, effective rates, were higher on export sales than on domestic sales. It appears, then, that except in the case of monopolies and centralized cartels, for which the allocation of output between domestic and export markets was

centrally decided, there is no evidence that exports were subsidized indirectly through the protection of domestic markets.

In certain industries exporting 10 to 50 percent of their output, a greater degree of competition prevailed in the domestic market (industrial machinery and knitted products), and the decision to export was made mainly on the basis of profitability to the exporter. The exports of these industries received higher effective protection than those of monopolistic industries, but less than those of cartelized industries (Table 7.6). At the same time, these competitive industries enjoyed a much higher rate of protection on local sales than on export sales. The fact that they have exported, nevertheless, is difficult to explain since under competition they would have been assumed to sell at higher prices in the domestic market.

THE INFANT INDUSTRY ARGUMENT. An analysis of the liberalization policy from 1962 to 1967 suggests that as quantitative restrictions were replaced by tariffs, one of the government's important criteria in determining the rate of protection to be granted was the industry's ability to survive.[23] According to Tov's study, the domestic resource cost (direct and indirect) of saving foreign exchange was used as a benchmark in determining the effective protection to be accorded to commodities whose imports were liberalized (that is, by replacing quantitative restrictions with import duties). Correspondingly, domestic resource costs before liberalization were highly correlated with the rate of effective protection granted by the government in determining the new tariffs. At the same time, in 90 percent of all cases, the effective protection rate accorded was higher than the domestic resource cost of foreign exchange.

At first sight, these findings seem to suggest a preference for inefficient industries. Indeed, some in Israel argued that while industries that are inefficient at an early stage of their development might increase their productivity rapidly in the future, it is not possible to foresee which of them will do so and hence they should all receive equal protection. In turn, others claimed that the government was extending protection in line with a valid infant industry argument; protection, rather than being a reward for inefficiency, was alleged to have been granted only after a priori assessment of the relative growth potential of all industries.

The hypothesis that the infant industry argument as described above was used in extending higher than average rates of protection is not easy to test because of the difficulties of measuring potential productivity growth and the lack of estimates of effective protection granted at the time of liberalization. Some insight may be gained, however, by estimating a regression equation, which attempts to explain interindustry differences in effective protection rates in 1965 in terms of differences in rates of growth of labor productivity (O/L) in the preceding period, which is used as a proxy for the expected rate of growth of productivity in the future. The regression further includes the capital-labor ratio of the industry (K/L) to take account of a possible preference for labor-intensive industries (t values in parentheses):

$$EPR_{65} = \underset{(3.382)}{1.443} + \underset{(2.321)}{0.3350}\,\frac{(O/L)_{65}}{(O/L)_{58}} + 9.976(K/L)_{65}.$$

$$R^2 = 0.107$$

The coefficient of determination is quite low, although it has the expected sign and is significant at the 5 percent level. This lends some support to the argument that the growth potential, as well as the degree of inefficiency, of an industry was considered in granting higher than average protection. Nevertheless, the results should be regarded as highly tentative in large part because of the unsatisfactory measurement of expected future productivity growth on the basis of past trends.

The coefficient of the capital-labor ratio is positive, although not significant at the 5 percent level. This result is somewhat unexpected.[24] The mass immigration, mainly of unskilled workers, during the first years of the state (1948–51), led to considerable unemployment as the government and the Histadrut (the General Federation of Israeli Labor) did not permit real wages to decline. Creating employment opportunities was part of the government's announced development strategy, so that one might have expected a higher rate of protection of labor-intensive industries. Even after full employment was achieved in the early 1960s, one might still have expected labor-intensive industries to be favored in 1965, since changes in the protection rates until 1965 were rather small.

THE TRADITION OF THE CASCADING TARIFF STRUCTURE. A tariff structure that provides higher protection to products at higher levels of fabrication is characteristic of many developed and developing countries. This pattern is broadly visible in the nominal rates of protection shown in Table 7.1, except for intermediate products I. The more detailed data presented in Table 7.7 show a somewhat different picture. While effective rates of protection were higher on final goods in agriculture, light industries, chemicals, and metal industries, they were lower on food and tobacco as well as on textiles and leather products.

PRESSURE GROUPS. In industries dominated by a small number of firms, firms may be expected to act jointly to influence the government. Pressure from such firms may be more effective than attempts to influence the govern-

Table 7.7. *Israel: Effective Protection on Domestic Sales, 1965*
(percent)

	Intermediate Goods	Consumption Goods	Investment Goods
Agriculture	24	51	-
Food, Beverages, Tobacco	278	145	-
Textiles, Leather	168	100	-
Light Industries	14	66	58
Chemicals	72	226	-
Metal Industries	53	121	65
Average	58	82	65

ment by a large number of small firms. To test this hypothesis, all industries were classified into "high" protection and "low" protection groups, depending on whether their protection rates were below or above average. Industries were classified as "highly" concentrated in cases where the share of the three largest firms in total output exceeded 70 percent, or a cartel arrangement was filed according to the law. All other industries were classified as having "low" concentration. The chi-square test revealed no significant association between the degree of concentration and the level of protection.

Hypothetical Free-Trade Exchange Rates, 1965 and 1968

To estimate the net incentives granted through the protective measures, nominal and effective protection rates estimated at the existing exchange rate had to be corrected for the overvaluation of the exchange rate compared with the hypothetical free-trade exchange rate. The extent of overvaluation of the exchange rate has been estimated on the assumption that the actual deficit in the current account of the balance of payments, both in 1965 and 1968, was the one government policy planned to achieve. Existing evidence does not point to excessive borrowing of foreign capital. Moreover, between 1958 and 1968 Israel accumulated foreign currency reserves in amounts that may be regarded as by and large adequate. The equilibrium exchange rates for 1965 and 1968 have been calculated from the available information on export supply elasticities, export demand elasticities, and import demand elasticities. Import supply elasticities from the rest of the world have been assumed to be infinite. The overvaluation of the exchange rate has been calculated as follows. First, all import duties and export subsidies were replaced by a single uniform exchange rate for current account transactions of the balance of payments. Second, the single rate was determined by the import and export elasticities, so as to keep the size of the deficit in the current account of the balance of payments constant.[25]

For lack of time series of import prices to purchasers in the domestic market, for total imports as well as for main commodity groups, I have relied on available estimates of demand elasticities for imports estimated from time-series data on import unit prices in U.S. dollars, exchange rates, and import duties and tariffs. The following import demand elasticities, which take account of estimates available for other countries, have been used in the calculations:

- *Commodities:* consumer goods, −2.0; intermediate goods, 0.0; investment goods, −1.0; average for all commodities, 0.4.
- *Services:* services other than defense and interest, −1.0; defense and interest payments, 0.0.

The following export supply elasticities have been used:

- *Commodities:* citrus, 0.0; other agriculture, 1.0; diamonds, 1.0; other manufactured exports, 2.0.
- *Services:* transport, 0.0; tourism, 1.0.

The elasticities assumed for manufactured goods are higher than those estimated by Halevy in a time-series context that did not allow for long-term adjustments.[26] In turn, the average export demand elasticity of −5.0 that has been assumed reflects the high demand elasticities for manufactured exports and lower elasticities for citrus and diamonds.

The above elasticities yielded a hypothetical free-trade exchange rate of I£4.47 per U.S. dollar in 1965—49 percent above the official exchange rate of I£3.00. For 1968 the hypothetical free-trade exchange rate was estimated at I£5.29 per dollar, or 51 percent above the official exchange rate of I£3.50. Net nominal and effective protection rates, adjusted for the extent of overvaluation compared with the free-trade situation, are presented in the section "Effects of the Incentives on Growth and the Allocation of Resources."

Conclusion

The preferential nature of the system of nominal protection can be summed up as follows: there is higher nominal protection on domestic sales than on exports; lower nominal protection on agricultural products and mining and energy than on industrial commodities; and relatively high rates on processed foods (sugar, chocolate, and sweets), nondurable consumer goods (knitted fabrics, outerwear), and consumer durables (radio and television sets). Nominal protection escalated from relatively low rates on raw materials to high rates on consumer goods.

Although nominal and effective protection rates corresponded quite closely, effective rates showed a less marked pattern of escalation than nominal rates; the preference for production for the local market, instead of for export, was much more noticeable in the structure of effective protection; and effective rates were much more widely dispersed than nominal rates. Effective rates differed more widely among export, export-and-import-competing, import-competing, and non-import-competing industries than did nominal rates, and effective protection was especially high on export-and-import-competing industries. Only in relatively few categories of products did domestic products and imports compete with one another. (Although such specialization could be explained, in theory, by natural advantages, there is reason to believe that it was largely due to the system of protection applied.) Effective protection rates varied to a considerable extent, and presumably reflected the government's decision to minimize the impact of foreign competition on domestic production.

Credit and Tax Incentives

Before 1948 the provision of cheap credit—directed by the government and lent at rates of interest below the market level—was of only slight importance. The role of the public sector, both in the medium- and long-term capital markets and in the allocation of short-term credit, was limited by the small volume of funds passing through its hands and by reliance on the discretion of commercial banks in the allocation of credit.[27]

Only in the early 1950s did the government begin to exert more influence on the allocation of short-term credit according to its list of priorities. Rapid price increases since the end of World War II had reduced the real interest charged on ordinary bank credit (under the interest ceiling) to very low and negative rates. Thus, there was a large surplus demand for bank credit at the legal rate, and this demand naturally gave rise to a "grey" or free-credit market, where the interest ceiling was evaded.

In April 1953 a new order of priorities for the allocation of commercial bank credit was established: agriculture, industries producing for export, and essential imports. Credit to agriculture had to make up at least 20 (later 22) percent of total commercial lending. Subsequently, government-directed special funds for extending short-term credit to enterprises, mainly for export financing, were established.

Since at the legal maximum rate of interest the excess demand for bank credit was very large, government intervention secured preferential treatment for certain lenders, whereas others had to look for short-term credits in the unofficial and uncontrolled credit market. Directed credits were granted at the regular rates of interest charged on bank credit, which had to be kept below the ceiling of 9 percent fixed by the interest law. When the legal ceiling was raised to 11 percent in 1957, directed credits continued to be extended at 9 percent, and thus an interest differential between regular and directed bank credits was created. This differential was widened by the expansion of the export credit funds, which granted credit at 6 percent.

Preferential credit assumes more significance from the end of the 1950s, when the role of the "grey" or free-credit market greatly increased. The main form of free-credit market that developed during the 1960s was bill brokerage, whereby banking institutions channeled funds directly from lenders to borrowers by transferring the borrower's promissory note to the lender at freely

Table 7.8. *Israel: Ordinary and Government-directed Short-term Credit Granted to Major Industries through the Banking System, September 1969*
(thousand Israeli pounds)

	Export Funds	Other Directed Credit	Total Directed Credit	Ordinary Credit and Bill Brokerage Credit	Total Short-term Credit	Directed as Percentage of Total a/
Agriculture b/	34,707	205,158 c/	239,865	164,334 d/	404,199	58.7
Manufacturing	545,329	133,322	678,651	750,949	1,429,600	47.5
Construction and Public Works	775	242	1,017	451,183	452,200	0.2
Trade and Services	2,526	973	3,499	783,301	786,800	0.4
Public Services	335	308	643	548,457	549,100	0.1
Others	2	353	355	342,945	343,300	1.0
Total (Average)	583,674	340,356	924,030	3,041,169	3,965,199	23.3

a/ These percentages should be treated with caution, since total short-term credit refers to balances outstanding on September 30, 1969, while directed credit refers to monthly averages.
b/ For agriculture, the monthly average over the year has been used, because of wide seasonal fluctuations in the monthly figures.
c/ Includes I£40,470 thousand of citrus financing, the bulk of which was used to finance exports.
d/ Obtained as a residual.

determined rates of interest. The interest ceiling on ordinary banking credit was abolished in 1970, but interest on directed credit remained under control.

Short-term Credit

Short-term credit at subsidized rates of interest in this study includes all types of credit that meet the following two criteria. First, the credit is granted at a rate of interest below that which will be defined as the equilibrium rate of interest in the credit market. Second, the extension of credit is directed by the Bank of Israel or government ministries, either according to general criteria established by these institutions (such as credit to exporters) or, ad hoc, to specific firms.[28]

Two borderline cases have not been included within the scope of directed credit as just defined. First is the case of ordinary bank credit, subject to the legal interest ceiling of 11 percent until 1970. Although the banks succeeded to some extent in evading the legal limit on interest, for example, by charging various fees and by moving forward the dates of accounts due, ordinary bank credit continued to be in considerable excess demand. But since the government did not directly intervene in the allocation of this credit, it has not been included here among the directed credits. The second case involves suppliers' credits, granted by suppliers abroad to Israeli firms, and other kinds of import financing. The use of credit from suppliers abroad was severely restricted by foreign exchange controls, and the licenses allocated by the treasury for the use of such credits satisfied only part of the demand at the existing interest differentials. Although the interest on suppliers' credits was not subsidized in any formal sense, the fact that their use was subject to strict government controls and that the licenses allocated satisfied only a small part of total demand would have warranted their inclusion in this study, had detailed information been available.

Directed credit is taken to include the resources of the commercial banks invested within the framework of government-directed credit funds. Formally, commercial banks regarded these resources as an extension of ordinary bank credit on which they earned a rate of return similar to that on nondirected bank credit, and on which they bore the ordinary commercial risks. Since the government directed the allocation of funds and bore the cost of lending the total amount at concessionary terms, however, ordinary bank resources within the directed funds have been included in the estimates of subsidized credits.

The directed short-term credit included in this study can be divided into three separate categories: export-financing funds (for manufacturing, agriculture, and tourism); government-directed funds financing working capital (for industry, agriculture, commerce, and export companies); and low-cost credit extended through exemptions from liquidity regulations (there were full exemptions and a wide variety of partial exemptions). The criteria for extending directed credits as well as the terms on which these credits were granted differed from category to category. While credits from export financing funds were allocated according to well-defined criteria, credits from the latter two categories were extended on the basis of individual approvals to each enterprise, according to a host of considerations. Therefore, credits from export financing funds have been considered individually, whereas credits from all other sources have been treated together, without distinction.

Export financing was a far more important source of directed credit than funds for working capital or exemptions from liquidity regulations; it accounted for three fifths of the total. Table 7.8 gives the distribution among major industries, in 1969, of directed short-term credit at subsidized rates of interest as defined here, and, for the sake of comparison, nondirected short-term credit, which is not covered in the study. It shows that most of the directed short-term credit was granted to agriculture and manufacturing, and that only negligible amounts were granted to construction and public works and the service industries. Out of I£921 million of directed short-term credit at the end of September 1969, I£916 million was allocated to agriculture and manufacturing. In these two sectors, directed credit accounted for 59 and 48 percent, respectively, of total short-term credit, whereas in all other sectors it accounted for less than 1 percent.

The major source of low-cost short-term credit to agriculture was the liquidity exemptions (both full and partial) given by the Bank of Israel to the banking institutions that carried out the financing. These special credit funds, drawing on the free resources of commercial banks and on deposits of various public bodies, were established to finance agricultural exports and citriculture. There were also some small funds for allocating credit to service sectors.

Within manufacturing, there were considerable interindustry differences in the allocation of directed credit. The following variables were introduced to explain these differences:

1. Preference to development areas. Variables related to the location of the firms of a given industry in the preferred development areas (*A* and *B*) as against highly developed areas (*C*), defined in terms of value added in the firms of the industry (V_{A+B}) as against (V_C).

2. Preference to exporting firms. The size of exports is a major factor in explaining variations in the allocation of credits from the export fund among industries. It also seems likely, however, that firms exporting part of their

output or value added were granted preferential access to credit for domestic production, from the working capital funds and within the framework of liquidity exemptions. Value added in exports (V_x) is used to indicate the relative importance of exports.

3. Preference to labor-intensive production processes. During the 1950s, firms with labor-intensive production processes, or those employing a labor force of relatively unskilled or semiskilled workers, were said to be entitled to preferential treatment by various government agencies. The hypothesis that this continued to be the case during the 1960s has been tested by including the capital-labor ratio of the industry (K/L) as well as its ratio of unskilled labor to total labor (L_u/L) among the explanatory variables.

4. Preference to government- or Histadrut-owned firms. The share of firms owned by the government or Histadrut within a given industry (V_p) has also been tried as an independent variable in explaining the allocation of preferential credits among manufacturing industries.

Data for the years 1965, 1967, and 1969 have been pooled to increase the number of observations. The diamond industry, which was subject to special arrangements, is excluded as is the residual "other industry" group. The data on output and value added used in the regressions are in current prices. The data on credit balances refer to balances at the end of the year for 1965 and 1967 and for the end of September for 1969. After some trial and error, it was found that the following equations provide the best explanation of the variations in directed short-term credit (t values in parentheses):[29]

Allocations from the industrial export funds:

$$EC = \underset{}{12992} + \underset{(1.86)}{0.65V_x} + \underset{(5.00)}{0.24V_{A+B}} \quad R^2 = 0.67$$
$$- \underset{(2.67)}{0.10V_C}.$$
$$(2.50)$$

Allocations from working capital funds and liquidity exemptions:

$$STC = \underset{}{3039} + \underset{(1.08)}{0.14V_{A+B}} - \underset{(2.80)}{0.03V_C} + \underset{(1.50)}{0.17V_x}$$
$$+ \underset{(2.43)}{53.4V_p} - \underset{(0.57)}{29.1K/L} + \underset{(1.51)}{15020L_u/L}. \quad \underset{(1.23)}{R^2 = 0.60}$$

In the first regression, value added in exports explains 42 percent of the interindustry variation of credit allocation from industrial export funds. The geographical variables are also significant and add 0.25 to the coefficient of determination, with V_{A+B} having a positive effect and V_C a negative effect, as expected.

In the second equation, the coefficients of V_{A+B} and V_x are positive, statistically significant, and of similar size; they jointly explain about 47 percent of the interindustry variation of working capital funds. The coefficients of the other variables (K/L, L_u/L, and V_p) are not significant, and their inclusion raises the R^2 only slightly.

Thus, locational considerations and the share of exports played the principal role in the allocation of credits from the working capital funds and under exemptions from liquidity regulations. Whatever role government preferences for the employment of unskilled labor might have played during the 1950s, this consideration seems to have been of little importance in later periods. The same conclusion applies to the ownership variable.

Medium- and Long-term Credit

Low-cost medium-term and long-term credit was granted to encourage investments in certain industries, with emphasis on the need to increase export potential and to stimulate the undeveloped areas of the economy. As with short-term credit, the medium- and long-term loans have had to satisfy certain criteria to be included in this study: they must be extended under government direction and at a rate of interest lower than that defined as the equilibrium rate of interest.

The emphasis, as in the case of short-term credit, is on whether the government directs the *allocation* of credit. For the loan to be regarded as a directed loan, however, the government does not have to be the source of the funds lent by a financial intermediary. All the medium- and long-term loans to be included in the study must meet the following conditions. First, the government determines the maximum amount to be lent to different categories of lenders, the rate of interest to be charged, the redemption period, and whether the loan should be linked to the cost-of-living index. Second, the government compensates the financial institutions for any differential that may arise between the cost of the capital they mobilize (including linkage to the cost-of-living index) and the terms of the directed loans granted, so as to leave them a profit of 1 to 2 percent. Third, the raising of capital in the local or foreign capital markets is subject to government approval, which is granted only after the uses of such funds by the financial intermediary have been determined.

Table 7.9 gives the distribution of directed medium- and long-term credit as defined here among major industries in 1965 and 1969. Since no statistics on the total medium- and long-term credit are available, total fixed investments have been used as a proxy for calculating the share of directed credit in the total.

Medium- and long-term loans to manufacturing industries at subsidized rates of interest were extended from two different sources: as direct loans from the government's development budget and from financial intermediaries specializing in the medium- and long-

Table 7.9. *Israel: Government-directed Medium- and Long-term Credit Granted to Major Industries through the Banking System, 1965 and 1969*
(million Israeli pounds)

	1965			1969		
	Directed Credit	Total Fixed Investments a/	Directed Credit as Percentage of Total Fixed Investments	Directed Credit	Total Fixed Investments	Directed Credit as Percentage of Total Fixed Investments
Agriculture	86.6	218.5	39.6	150.2	236.9	63.4
Manufacturing	154.7	383.0	40.4	235.1	673.0	34.9
Housing and Construction	148.1	1,036.8	14.3	261.8	1,007.1	26.0
Transport and Communications	69.4	584.8	11.9	111.3	896.7	12.4
Electricity	42.8	111.8	38.3	34.0	118.9	28.6
Other Services (including Water Supply)	156.8	583.1	26.9	294.6	777.2	37.9
Total (Average)	658.4	2,918.0	22.6	1,087.0	3,709.8	29.3

Note: Directed credit is not synonymous with government finance, because the latter includes finance through the acquisition of share capital.

a/ Buildings and equipment. Does not include credit to households other than for housing (I£ 23.5 million in 1965 and I£ 45.2 million in 1969).

term financing of industrial investment. The terms and conditions of the loans depended on whether the investment had approved status under the Law for Encouragement of Capital Investment and on the basis of geographical location. In 1965 the country was divided into five development areas, and the interest rate increased from 6.5 percent for firms in the least developed areas to 11 percent in the most developed areas. In turn, the provision of loans as a proportion of total investment declined from 80 percent in the least developed to 40 percent in the most developed areas. In 1966 the country was divided into three instead of five areas, and interest rates were raised to range from 7.3 to 12 percent, while loans as a proportion of total investment were reduced slightly. Subsequent changes reduced the preference given to development areas.

Directed medium- and long-term loans to agriculture were granted within one of the following three financing frameworks (generally depending on the stage of development of the agricultural settlement). Loans from the Settlement Department of the Jewish Agency were made to new settlements, which were entitled to intensive financial aid until they became economically self-supporting and solvent. The loans were granted at an interest rate of 2 percent for a period of fifty years. "Centralized credit" was granted by a single financial institution to settlements that had become self-sufficient and solvent, and also to settlements in financial difficulties that needed long-term loans to finance current investment and consolidate short-term credits into long-term loans. Settlements eligible for centralized credit were entitled to consolidation loans at an interest rate of 8 percent for twenty-five years. Ordinary directed long-term loans, to finance investments in established settle-

ments, were made either from the development budget or from funds run jointly by the treasury and the financial institutions, providing loans for 70 to 90 percent of the investment, generally at an interest rate of 9 percent.

Directed medium- and long-term loans were also granted to the tourist industry and to land, sea, and air transport. In the tourist industry the terms of the loans depended on the type of investment (such as hotel buildings or restaurants), the status of the company (approved or nonapproved), and its geographical location. The loans generally were given at a 9 percent rate of interest. Interest rates on land transport loans were between 6 and 12 percent, whereas companies dealing in air and sea transport received directed loans denominated in foreign currency at a 6 percent rate of interest.

As in the case of directed short-term credit, there were considerable differences in the allocation of directed medium- and long-term credit among manufacturing industries. These differences may be explained by reference to the location of the investment, its contribution to exports, and its effect on employment. The relevant variables are defined below.

1. Preference to development areas. Two variables related to the distribution of the investment in an industry between development areas (*A* and *B*) and the highly developed areas (*C*) were defined earlier.

2. Preference to exporting firms. In the absence of information on the export orientation of particular investments, preference to exporting firms has been measured in terms of the past increase in the exports of the industry, the increase in the exports of the industry after the loan was granted, or an average of the increase in exports before and after the loan was granted.

3. Preference to labor-intensive production processes. As for the short-run regressions, this has been measured in terms of either the capital-labor ratio or the unskilled labor–total labor ratio.

4. Investment in new firms or expansion of existing firms. The total investment in an industry was divided into two parts—investments in new enterprises (*IN*) and investments in enterprises undergoing expansion (*IE*)—so as to test the hypothesis that the government would put less emphasis on financing investments in well-established firms, which had accumulated depreciation funds and undistributed profits.

Data on directed medium- and long-term loans granted to eighteen manufacturing industries in 1965 and 1969 have been used in the calculations. Three industries—mining and quarrying, diamonds, and the residual group of other industries—have been excluded from the regression analysis because of their special character.

The following equation gave the best explanation of the allocation of subsidized medium- and long-term loans (*t* values in parentheses):

$$LTL = \underset{(0.06)}{-\ 152} + \underset{(5.00)}{0.05EM} + \underset{(5.33)}{0.64IN} + \underset{(3.75)}{0.15IE} + \underset{(1.48)}{31K/L} + \underset{(0.12)}{1291Lu/L}. \qquad R^2 = 0.78$$

where *EM* refers to the cumulative increase in exports of an industry over the period 1964–66 for the 1965 observations, and the increase over the period 1968–70 for the 1969 observations.

As expected, the coefficients of the two investment variables are significant statistically, the coefficient of new investments being considerably higher than that of expansions. Additional results from slightly different regression equations suggest, however, that the higher coefficient of new investment in part reflects the fact that a higher proportion of new investment was located in development areas.[30] At the same time, unlike the case of directed short-term credit, introducing locational variables did not improve the fit of the regression equation, nor was value added in exports or past exports statistically significant. The coefficient of the capital-labor ratio had a low level of significance, and the unskilled labor–total labor ratio was not significant at all.

The Equilibrium Rate of Interest

The subsidies embodied in the preferential credit granted to different industries reflect differences between the terms of the loan granted and the equilibrium rate of interest, that is, the rate of interest that the borrower would have paid on an unsubsidized loan. Since different factors influence the equilibrium rate of interest in the short-term and the medium- and long-term capital markets, and different institutional arrangements regulate and control lending and borrowing in these markets, they will be treated separately.

If low-cost short-term credit constitutes only a small part of the total short-term credit granted, and the credit market is mainly competitive, the actual interest rate on ordinary credit from commercial banks will give a more or less reliable estimate of the equilibrium interest rate that would be established in a hypothetical free competitive market. For the Israeli economy in the period studied, the problem is complicated, since directed short-term credit was of more than marginal importance and since the rate of interest on loans from commercial banks was also regulated.

The only type of credit for which a short-term rate of interest was determined by forces of demand and supply was bill brokerage transactions. During the years examined here, credit transactions of this type amounted

to about 40 percent of total short-term credit and constituted a large free market in which the effective rate of interest was determined by market conditions and credit was freely allocated. The rate of interest determined in this market may be regarded as an equilibrium rate in the sense that it not only balanced demand and supply in this particular market, but also represented the effective marginal cost of capital for a large number of firms. This was because, for various needs such as suppliers' credit or the building up of stocks, most firms had to turn to uncontrolled credit to supplement their credit allocations.

Developments in the credit market after the legal interest ceiling was abolished in the spring of 1970 lend further support to the use of the interest on bill brokerage transactions as the equilibrium rate of interest. The rate of interest on short-term ordinary bank credit rose gradually, and within a few months came within 1 percent of the level previously established in the bill brokerage market.

To measure the subsidies granted in the form of low-cost short-term credit, the interest rate to borrowers in the bill brokerage market in each of the years was taken as an indication of the equilibrium short-term interest rate. Since the interest rate differed between the large banks and the small banks and among various borrowers, according to the degree of risk in the transactions, a weighted average of interest rates was taken. In each of the years considered—1965, 1967, and 1969—this weighted average was 15 percent in nominal terms. While in these years credit transactions were made outside the banking system at interest rates of 20 and 30 percent, the risk involved in these transactions was quite high, so that part of the interest was, in fact, a premium for greater than normal risk.

The medium- and long-term capital market was to a considerable extent controlled by the government, which determined in large measure the percentage of the total funds to be invested by institutional investors in government-approved bonds, the interest to be paid, the allocation of the funds, and the rate of interest on loans. Moreover, since most government loans were extended as a predetermined percentage of the total investment requirements of a firm, the cost of complementary financing from other sources cannot be regarded as independent of the terms of the government loans. Therefore, the equilibrium rate of interest, which would have prevailed in a free market without government intervention, cannot be directly observed and has to be estimated by a more indirect method.

If all investments were riskless and there were no government intervention, the rate of interest paid by a single enterprise or an industry would equal the cost of capital to the economy. The latter, in turn, would be at the point where the supply schedule of capital to the economy (domestic and foreign) intersects the schedule of the marginal productivity of capital. Thus the cost of capital could be estimated either from the demand side, by estimating the marginal productivity of capital, or from the supply side, by estimating the marginal cost of raising capital.

Government intervention in the capital market complicates the relation between the marginal cost of capital to the economy and the supply price of capital. First, in the simplest case of government intervention, the government acts as a large financial investment company borrowing funds and relending them to investors, thereby reducing the risk facing potential lenders, whether domestic or foreign. Second, in addition to its risk-reducing function, the government may lend at a lower rate than it borrows, thereby subsidizing capital formation. Third, discrimination among the different lenders, either with regard to the proportion of the investment financed by the government, the rate of interest on government loans, or the period of the loan, establishes different costs of capital for different lenders. As a result, the actual amount of capital of each enterprise deviates from the equilibrium capital stock.

Several studies have estimated production functions for the Israeli economy as a whole, for agriculture and for manufacturing, and for various industries within these sectors. Although estimates of the marginal productivity of capital derived from these studies differ to some extent, depending on methods of estimation and the definitions used, the results cluster around 15 to 16 percent in real terms for the private economy.[31]

The supply schedule of capital funds to the economy can be separated into schedules of domestic and foreign savings. The cost of raising funds from domestic sources is the marginal rate of return received by savers. This, in turn, depends largely on the rate of interest received on government bonds and, to a lesser extent, on rates of return in the secondary bond market and the stock exchange. The latter two were of relatively little importance in Israel during the period considered. The rate of interest on government bonds fluctuated between 6.0 and 6.5 percent in real terms and was free of risk. Interest rates were somewhat higher (7 to 8 percent in real terms) in the secondary bond market, where the extent of risk was small. According to one estimate, the average annual yield of the stock market in real terms during the whole of the long cycle from 1951 to 1962 averaged about 14 percent, inclusive of risk.[32]

The rate of interest paid on foreign capital varied greatly, from the low rates on capital received from various public sources to the going rate of interest

Table 7.10. *Israel: Subsidies Originating from Government-directed Short-, Medium-, and Long-term Credit, 1965 and 1969*
(thousand Israeli pounds)

	1965				1969			
	Subsidies in Short-term Credit	Subsidies in Medium- and Long-term Credit	Total Subsidies	Total Subsidies as Percentage of Value Added a/	Subsidies in Short-term Credit	Subsidies in Medium- and Long-term Credit	Total Subsidies	Total Subsidies as Percentage of Value Added a/
Agriculture	9,220	47,910	57,130	7.7	16,270	77,600	93,870	9.3
Manufacturing	24,100	22,310	46,410	2.0	57,320	60,540	117,860	4.1
Housing and Construction b/	322	79,882	80,204	4.8	1,017	118,292	119,309	5.3
Transport and Communications	114	23,621	23,735	3.2	188	43,276	43,464	3.7
Other Services	2,646	40,092	42,738	1.7	4,309	96,153	100,462	2.7
Total	36,402	213,815	250,217		79,104	395,861	474,965	

a/ At domestic prices.
b/ This item includes electricity and water supply which for technical reasons cannot be subtracted from the value added in construction.

abroad, which was paid on commercial loans. The most important source of capital at commercial rates of interest was the Independence and Development Bonds, sold in various capital markets, but mainly in the United States. Although the nominal rate of interest on these bonds was 4 percent, the effective rate of interest (inclusive of selling costs) has been estimated at 8 percent. It cannot be assumed, however, that Israel could borrow unlimited amounts at a given interest rate.

To take account of the estimates of the marginal productivity of capital and of the cost of raising funds from domestic and foreign sources, a 12 percent real rate of interest is used here. It corresponds to 18 percent in nominal terms, if a long-term annual average increase of 6 percent is assumed in the domestic price level. This rate makes a reasonable allowance for the provision of long-term capital. It compares with the equilibrium short-term rate of 15 percent.

The Subsidy on Government-directed Loans

Table 7.10 shows the distribution of subsidies among broad sectors, while Table 7.11 shows the subsidies according to the ten-industry classification used in this study. The subsidy embodied in directed short-term loans has been calculated as the difference between actual annual payments of interest on short-term loans and the hypothetical payments at the estimated 15 percent equilibrium rate of interest.

There are two ways of calculating the subsidies granted through medium- and long-term loans on an annual basis: calculating the present value of the subsidy embodied in all loans granted during the year considered, and calculating credit subsidies as the increment in profits in a given year through loans granted in the past and still outstanding. In this study, the first has been used. It can be shown that this procedure yields lower estimates than the second as long as the rate of growth of loans is less than the nominal interest rate. In fact, the rate of growth of the loans granted from 1965 to 1969 was about 11 percent.

With regard to subsidies through medium- and long-term loans, the preference for agriculture over manufacturing is pronounced, mainly because of the better terms (lower rates of interest, and loans for longer periods) granted to agriculture, and only to a small extent because of differences in the percentage of long-term capital requirements financed by directed loans.

The Law for Encouragement of Capital Investment

The Law for Encouragement of Capital Investment was passed by the Israeli Parliament in 1950. The law aimed to encourage foreign and domestic investment "for the development of the productive capacity, the improvement of the balance of payments, the absorption of immigrants and the planned dispersion of the population over the whole area of the State." Investments that conformed with these objectives had to be approved by the Investment Center to be eligible for benefits under the law.

Although both foreign and domestic investors were eligible for the benefits, the former were accorded preference in being granted approved status under the investment law. Foreign investments, since they provided scarce foreign currency, were regarded as desirable almost regardless of their distribution among industries. In addition, foreign investors benefited from a more lenient application of the foreign currency regulations with regard to the allocation of import licenses. During the period 1955–62, approved domestic and foreign investments were about equal in volume, but the share of foreign investment declined to a considerable extent during 1965–68. At the same time, there were marked differences in the distribution of domestic and foreign investments among different industries. Whereas two thirds of domestic investments were in manufacturing industries, foreign investments were equally divided among manufacturing, finance, and real estate.

Since the objectives of the law were phrased in general terms, the Investment Center was vested with the authority to interpret the law and grant approvals at its own discretion. Although it was formally subordinate to both the minister of finance and the minister of commerce and industry, the center became associated mainly with the ministry of the latter, and in its daily work relied on the services of this ministry's staff.

A detailed analysis of the center's policy is beyond the scope of this study, but the criteria it used in approving or rejecting investment projects are of interest. The discretion of the Investment Center in approving an investment was very wide and was applied liberally. Although officially the effect of an investment on the balance of payments and the encouragement of investments in development areas and in new processes were important criteria of approval, it seems that few investment projects were ever rejected. In fact, during the 1960s more than 50 percent of all investments in manufacturing were approved by the center. The distribution of approved investments among industries was broadly similar to that of nonapproved investments. Exceptions were food processing, in which the share of approved investments (7 percent) was much lower than that of all investments (17 percent) and chemicals, for which the opposite was the case (29 and 23 percent).

Many investments were approved even though they would have been carried out anyway, and until the end of the 1950s many enterprises were granted retroactive

Table 7.11. *Israel: Credit Subsidies, by Industry Group, 1965 and 1968*
(million Israeli pounds)

	Subsidies in Long- and Medium-term Credit		Subsidies in Short-term Credit		Total Subsidies	
	1965	1968	1965	1968	1965	1968
Agriculture, Forestry, and Fishing (I)	45.0	72.0	8.8	15.6	53.8	87.6
Mining and Energy (IV)	0.6	1.1	0.3	0.5	0.9	1.6
Primary Activities (I&IV)	45.6	73.1	9.1	16.1	54.7	89.2
Processed Foods (II)	2.5	4.8	1.3	3.3	3.8	8.1
Beverages and Tobacco (III)	-	0.5	0.2	0.2	0.2	0.7
Construction Materials (V)	0.9	1.1	0.7	0.3	1.1	1.4
Intermediate Products I (VI A)	9.0	9.5	4.9	10.6	13.9	20.1
Intermediate Products II (VI B)	3.5	22.9	3.8	14.5	7.3	37.4
Nondurable Consumer Goods (VII)	0.6	2.2	0.8	3.0	1.4	5.2
Consumer Durables (VIII)	0.7	2.8	0.4	0.7	1.1	3.5
Machinery (IX)	0.3	0.8	0.3	0.9	0.6	1.7
Transport Equipment (X)	-	1.0	0.1	-	0.1	1.0
Miscellaneous (Diamonds) (XI)	-	-	7.9	15.6	7.9	15.6
Manufacturing (II, III, V-XI)	17.5	45.6	19.9	49.1	37.4	94.7
All Industries (I-XI)	63.1	118.7	29.0	65.2	92.1	183.9

approvals for investments already made. It would also appear that investments were attracted to and approved in lines of production that were traditional in the Israeli economy and had well-established markets. Many approvals were granted to existing firms to expand production of their existing lines. According to one inquiry, rejection of an application by a new enterprise may have caused a cancellation or at least an indefinite postponement of the investment, but rejection of an application for the approval of an investment in an existing firm did not prevent the firm, in most cases, from undertaking the investment.[33]

It has been suggested that a commitment to export part of the output was always a condition for approval. In 1961, however, out of the 414 approved firms, 54 percent did not export at all; the remaining 46 percent exported 14 percent of their output. In fact, only from 1963 onward was approval made conditional on an undertaking by the investor to export a certain share of his output. This provision applied only to enterprises outside the development areas. During the period 1965–68, one third of all approvals was granted on the condition that the enterprise would export at least 50 percent of its output; another third of all approvals called for at least some exports, without specifying the exact share. However, the export pledges were not enforced.

The Law for Encouragement of Capital Investment aimed to attract investors to development areas in two ways. First, an approved investment in a development area had to meet less exacting requirements than an approved investment in a developed area: less equity capital was required from the investor, and a lower percentage of output had to be committed for exports. Second, higher incentives were granted to an approved investment in a development area than to one in a developed area. Apart from directed loans having lower interest rates and covering a higher share of the investment cost, investors in development areas also received higher cash grants for building and site development and for the purchase of machinery and equipment.

Incentives Granted to Approved Investments

Four kinds of incentives were granted under the Law for Encouragement of Capital Investment in force in the second half of the 1960s.

1. Tax exemptions. The tax concessions granted under the law were exemptions from income tax, allowances for accelerated depreciation, and exemptions from various indirect taxes such as import duties, purchase taxes on machinery and equipment, estate duties, and property taxes, for a period of five years.

2. The repatriation of capital and profits. Foreign investors were allowed to repatriate profits from investments in approved enterprises, at an annual rate of up to 10 percent of the original investment. After five years the foreign investor could repatriate his original investment with accumulated investment in a single sum; before the five years had elapsed, the amount could be withdrawn in equal annual installments within the period remaining.

3. Directed medium- and long-term loans. Approved enterprises were not the only ones eligible for government-directed loans, nor did the law stipulate that they should receive such loans, but in practice they received preferential access to loans from the development budget.

4. Cash grants. Cash grants were made for approved enterprises, in amounts that depended on whether the investment was in building or in equipment, and in development or in already developed areas. These grants were introduced in 1967 for approved investments carried out after June 1966 but before July 1972. In addition, from 1969 onward, approved enterprises were offered special cash grants to encourage the purchase of equipment manufactured in Israel.

No comprehensive data are available on the value, in proportion to approved investments, of the various incentives in force in 1965 or in later years. For this study, the subsidy equivalent of tax exemptions was estimated as well as the amount of cash grants for approved industrial enterprises actually paid out for the year 1968. The subsidy equivalent of the provisions for the repatriation of profit could not be estimated, while that of directed medium- and long-term loans was shown earlier.

Income Tax Exemptions

In 1965 a nonapproved enterprise was liable to a 28 percent corporate profits tax and to a 25 percent income tax on profits after the corporate profits tax had been deducted, which amounted to an effective rate of 18 percent income tax on pretax profits.[34] In addition, dividends were taxed at the individual tax rates that applied to the recipients, after the latter had been credited with income tax paid by the corporation. Approved enterprises paid only the corporate profits tax, and were exempt from income tax, during a five-year period commencing with the first year in which there was any taxable income. Dividends paid out of profits earned during this period were valid for a period not exceeding twelve years from the approval and ten years from the start of production.[35] If the approved investor was an individual and not a corporation, his personal income derived from an approved investment was liable to income tax at a rate not exceeding 25 percent.

For this study, a survey was made of the profit and loss statements and the tax liabilities of approved and

Table 7.12. *Israel: Tax Exemptions and Investment Grants, by Industry Group, 1968*
(thousand Israeli pounds)

	Tax Exemptions	Investment Grants	Total	Total as Percentage of Value Added in World Market Prices
Agriculture, Forestry, and Fishing (I)	-	-	-	-
Mining and Energy (IV)	-	-	-	-
Primary Activities (I&IV)	-	-	-	-
Processed Foods (II)	2,336	980	3,316	4.0
Beverages and Tobacco (III)	-	-	-	-
Construction Materials (V)	50	1,100	1,150	1.7
Intermediate Products I (VI A)	5,640	10,250	15,890	7.4
Intermediate Products II (VI B)	6,570	6,030	12,600	4.0
Nondurable Consumer Goods (VII)	2,310	4,700	7,010	4.0
Consumer Goods (VIII)	930	960	1,890	2.1
Machinery (IX)	1,230	110	1,340	1.1
Transport Equipment (X)	2,642	420	3,062	13.9
Miscellaneous (Diamonds) (XI)	-	-	-	-
Manufacturing (II, III, V-XI)	21,708	24,550	46,258	3.6
All Industries	21,708	24,550	46,258	2.4

nonapproved corporations in industry for fiscal year 1968. According to this survey, 43 percent of all approved enterprises in 1968 reported losses and therefore were not liable to taxes; 28 percent of nonapproved enterprises reported losses. It is quite possible that the high percentage of approved corporations recording losses reflects the accelerated depreciation of their assets for tax-saving purposes. For those approved corporations that reported profits, the theoretical liability for corporate income tax has been estimated at I£12.5 million. Dividends from approved enterprises were not liable to personal income tax; the value of these exemptions was estimated at I£9 million.[36]

Table 7.12 shows the distribution of tax exemptions in fiscal year 1968 among the ten industry categories. Two points about this distribution should be borne in mind. First, in a sense, it is the outcome of government preferences in granting the status of approved enterprise, combined with the ability of individual enterprises to exploit those exemptions by showing a high level of profits for the period of tax exemptions. Second, lower liability for taxes of the approved enterprises may have given them an incentive to overreport their earned profits and distributed profits. Other enterprises tended to report relatively high nonoperating expenses to evade taxation. Also, income may have been shifted from

nonapproved to approved corporations under the same ownership. In 1968 almost all approved profit-earning enterprises distributed their profits (95 percent), whereas only 8 percent of the nonapproved profit-earning enterprises did so.

Investment Grants

The cash grants introduced in 1967 were intended to stimulate investments, which had fallen sharply during the recession of 1966–67, and therefore applied to a limited period (July 1966 to June 1972). The grants were fixed as percentages of the total investment in fixed assets. In the two development areas, they were 20 and 33 percent, and 15 and 25 percent, and in the highly developed areas 10 and 20 percent, for building and site development and for machinery and equipment, respectively.

Table 7.12 presents the distribution of the cash grants in 1968 according to the ten industry categories. The influences on this distribution were examined by means of regression analysis. Among the various alternatives tried, the following formulation has given the best fit (t values in parentheses):

$$GR = \underset{}{287} + \underset{(0.73)}{0.08EM} + \underset{(0.89)}{0.06IN} + \underset{(3.00)}{0.11IE(A+B)} \qquad \underset{(2.75)}{}$$

$$R^2 = 0.72$$

where GR denotes the amount of cash granted, EM stands for the increase in exports over the period 1968–70, IN denotes investments in new enterprise, and $IE(A + B)$ represents investments in existing enterprises in development areas A and B.

Table 7.12 also presents the combined effects of tax exemptions and investment grants as percentages of value added at world market prices in the ten-industry-group breakdown for 1968. In the economy as a whole the subsidy equivalents of tax exemptions and investment grants were approximately equal, but their importance varied considerably among the industry groups. Taken together, the subsidy equivalent of the two measures, as a percentage of world market value added, was largest for transport equipment (13.9 percent), followed by intermediate products I (7.4 percent). In turn, the subsidy equivalents for agriculture, forestry and fishing, mining and energy, and diamonds were so small that they could be safely neglected.

The Combined System of Incentives

The two previous sections have described the effects of the system of incentives on value added in 1965 and 1968, distinguishing three types of policy instruments: protection of domestic production, either for the domestic market or for exports, by means of quantitative import restrictions, import duties, export subsidies, or taxes and subsidies on domestic inputs; directed short-, medium-, and long-term loans at concessionary rates of interest; and incentives granted under the Law for Encouragement of Capital Investment in the form of tax rebates and, after 1967, investment grants.

The list of incentives covered in this study is far from exhaustive. Various forms of government intervention had to be ignored because of the difficulties of identifying and quantifying them. Perhaps the most important omission is government expenditures on education. These expenditures, which can be regarded as a subsidy to investment in education,[37] reduce the private cost of acquiring education and hence the supply price of educated labor. Thus they can be seen as subsidizing industries that relied heavily on highly educated labor, such as machinery and equipment, in relation to industries relying mainly on unskilled labor, such as agriculture, food processing, and leather. Furthermore, Israel's exports were slightly more intensive in unskilled labor than its production for domestic markets, so that the net incentives received by export industries reported in this study may be biased upward somewhat.[38]

A second shortcoming of the estimates stems from the possibilities for error in quantifying the protection, credit, and tax measures applied. Correspondingly, the estimates should be regarded only as orders of magnitude, and the results should be interpreted with great caution.

One way to estimate the relative importance of the different protective measures in force is to compare the sum of the positive and negative subsidies provided by each. In 1965 the weight of effective protection in the total was 78 percent, that of credit subsidies 18 percent, and that of tax exemptions and investment grants 4 percent. These proportions had changed little by 1968.

Another way of indicating the relative importance of different protective measures is to compare effective protection and effective subsidy rates; the latter express the combined incidence of protective measures, credit subsidies, tax exemptions, and investment grants on value added. In deriving the estimates of effective subsidy rates shown in Table 7.1, credit subsidies, tax exemptions, and investment grants have been expressed in terms of deviations from the average, so that the overall averages of effective protection and subsidy rates are equal.

The Spearman rank correlation coefficient between effective rates of protection and subsidy in 1968 is 0.946. This high correlation appears to reflect the importance of protective measures in the system of incentives. As Table 7.13 shows, the other incentive measures were not closely related to effective protection. Also, there is little

Table 7.13. *Israel: Rank Correlation Coefficients among Indicators of Incentives, 1968*

	Effective Rate of Protection	Rate of Credit Subsidies	Rate of Tax Exemptions and Investment Grants	Effective Rate of Subsidy
Effective Rate of Protection	1.000	.435	.436	.946
Rate of Credit Subsidies	.435	1.000	.111	.519
Rate of Tax Exemptions and Investment Grants	.436	.111	1.000	.462
Effective Rate of Subsidy	.946	.519	.462	1.000

correlation between rates of credit subsidies, on the one hand, and tax exemptions and investment grants, on the other.

The Structure of Incentives among Industry Groups

Table 7.1 shows the structure of incentives for the ten categories of industry. The table includes information on effective protection and effective subsidy rates for 1965 and 1968. The estimates have been made at the actual exchange rate; it should be borne in mind that the percentage excess of the hypothetical free-trade exchange rate over the actual rate was 49 percent in 1965 and 51 percent in 1968.

The estimated effective rates of protection and subsidy in 1968 were similar to those in 1965. The Spearman rank correlation coefficient between the estimates for the two years, calculated in a 128-sector breakdown, is 0.877 for effective protection rates and 0.742 for effective subsidy rates.

The stability of the overall incentive system between 1965 and 1968 conceals changes that reduced its bias against agriculture as well as against exports. These changes were due largely to changes in the subsidies provided to exports of citrus fruits. With subsidies of 13 percent on f.o.b. export value, the effective protection of citrus exports rose from 1 percent in 1965 to 24 percent in 1968. Poultry and cattle raising also received greater protection in 1968 than in 1965. Within the manufacturing sector, the principal changes were an increase in the effective subsidy rate on transport equipment and food products and a decrease in that on beverages and tobacco.

In the following, we concentrate on estimates for 1968. We first consider the results obtained in the ten-industry breakdown, and then the estimates derived for individual trade categories. Finally, use will be made of a two-digit industrial classification scheme, with further attention given to three-digit sectoral results.

The continuing bias of the system of protection against primary activities in 1968 is indicated by the average effective rate of protection of 45 percent in this sector compared with 71 percent for manufactured products. Within primary activities, the relevant estimates are 48 percent for agriculture and 18 percent for mining. These results are little affected if account is taken of credit and tax incentives.

Introducing credit and tax incentives has a greater effect on individual industry categories within the manufacturing sector. The virtual lack of such incentives to construction materials and machinery kept their effective rate of subsidy well below their effective rate of protection. Intermediate products and transport equipment benefited from credit and tax incentives.

All in all, effective subsidy rates were the highest for transport equipment (181 percent) and processed foods (149 percent), followed by consumer durables (110 percent), beverages and tobacco (100 percent), nondurable consumer goods (100 percent), and intermediate goods (87 and 70 percent for intermediate goods at lower and at higher levels of fabrication, respectively). At the other extreme, effective rates of subsidy were 2 percent for diamonds, 24 percent for construction materials, and 24 percent for machinery (Table 7.1).

Incentives to Exports and to Import Substitution

Incentives to exports and to import substitution may be considered in two ways: by examining relative incentives to exports and to domestic sales in particular product categories, and by analyzing incentives provided to export, export-and-import-competing, import-competing, and non-import-competing industries. Table 7.2 uses a system of classification that permits both questions to be examined simultaneously. The table also separates the traditional export industries (including citrus fruit and diamonds) from the nontraditional.

Estimates of effective protection show a bias against exports and in favor of production for domestic markets. The introduction of credit and tax incentives affects the overall results very little since the credit incentives to exports were largely offset by the investment grants and tax exemptions, which favored production for domestic markets. The principal exports—citrus fruit and diamonds—did not receive preferential tax treatment and investment grants.

Incentives were biased against exports and in favor of import substitution in all trade categories. Nevertheless, in a few sectors, including wine, cotton yarn, woolen yarn, and plywood, effective rates of subsidy were higher for export than for domestic sales; this pattern reflects the subsidies granted to exports that were examined earlier.

Although the bias against exports and in favor of import substitution was less pronounced for traditional than for nontraditional exports, the system of incentives discriminated against traditional exports and favored the other trade categories. Among the latter, export-and-import-competing industries received the highest effective subsidies, followed by import-competing industries, non-import-competing industries, and nontraditional export industries. The bias against exports was the most pronounced in import-competing industries and relatively small in non-import-competing industries.

Protection at the Industry Level

This section reviews protection rates at the two-digit industry level, using the detailed estimates in Appendix Table 7.1 that are summarized in Table 7.14.

AGRICULTURE. On the average, agricultural commodities had lower effective subsidy rates than industrial products, but there were considerable differences within agriculture. Fresh vegetables, citrus, grapes, melons, and several other fruits for which climate gives Israel a competitive advantage, accounted for 45 percent of total value added generated by tradeable agricultural products, expressed in domestic prices.

Highly protected industries, notably cattle and poultry, accounted for 23 percent of value added in agriculture. Their output was subject to quotas assigned to the various agricultural units by the authorities, while prices to producers and consumers were set through a system of price controls and production subsidies.[39] The cattle and poultry industries were insulated from foreign competition by administrative import controls. Imports of frozen meat, the nearest substitute to local fresh meat, were regulated by the government and were practically never admitted. Imports and exports of eggs were also administratively controlled and were influenced by the shortages and surpluses experienced under the production quota system. All in all, the differentials between the domestic and world prices of the tradeable products of the cattle and poultry industries reflect the levels of inefficiency allowed by the government's agricultural policies.

The government also controlled the prices of cotton fibers, which accounted for 7 percent of agricultural value added. In the period under review, the prices received by cotton growers from domestic yarn manufacturers were set above those in the world market, as measured by the prices Israel received for raw cotton exports. This price discrimination was made possible by concentrating all sales—domestic and export—in the hands of a marketing board and by prohibiting imports of cotton fibers of the length grown in Israel.

The cotton fibers sector is a good illustration of the fact that protection in agriculture is much more liable to fluctuations than protection in manufacturing since primary commodity prices vary so much more than industrial prices. The gap that existed in 1965–68 between the domestic and world prices of cotton fibers disappeared in the early 1970s after the rise in world prices for raw cotton. It reappeared, however, once world market prices fell again.

Two of Israel's nontraded agricultural commodities, sugar beets and milk, are considered here since they were used as inputs into industrial sectors producing tradeables (sugar, cheese, and butter) on which value added in world market prices was negative under protection. The share of domestically produced sugar in Israel's total sugar consumption was a function of the prices the government set to farmers for their sugar beet crop. The government monopolized sugar imports and could have discouraged sugar beet production and local sugar refining at times when world sugar prices were relatively low. The high level of protection provided to sugar production in 1968, however, shows that such a policy was not pursued.

The dairy products sector comprises the processing

Table 7.14. *Israel: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Two-digit Industry Group, 1968*
(percent)

		Nominal Protection			Effective Protection		
		E	D	A	E	D	A
01-09	Agriculture, Forestry, and Fishing	13	27	23	26	58	48
10-19	Mining and Quarrying	12	20	14	16	24	18
20	Processed Foods a/	13	29	22	16	142	79
21	Processed Foods b/	5	43	39	29	266	-8
22	Textiles	41	63	55	79	145	124
23	Clothing	29	98	82	14	183	138
24	Wood Products, Furniture	41	29	30	89	14	18
25	Paper, Paperboard	11	36	35	5	89	83
26	Printing, Publishing	-	-	-	-	-	-
27	Leather	13	45	43	33	60	59
28	Rubber and Plastic Products	11	62	49	22	165	138
29	Chemical Products	12	54	42	26	271	167
30	Nonmetallic Minerals	9	23	23	-8	35	34
31	Diamonds	-1	-	-1	-0	-	-0
32	Basic Metals	6	31	30	16	114	112
33	Metal Products	10	31	30	-10	40	38
34	Machinery	10	30	29	6	30	28
35	Electrical, Electronic Equipment	10	43	41	-8	96	89
36	Transport Equipment	-	57	57	-	188	188
39	Miscellaneous	-	82	82	-	278	278
20-39	Total Manufacturing	10	44	34	16	90	71
01-39	Average	11	40	31	19	79	62

a/ Livestock products, vegetables, oil products, processing of grains.
b/ Sugar, chocolate, wine and spirits, beverages, tobacco.

industry and the agricultural production of a nontraded input, milk. It is difficult to ascribe the contribution made by each of these subsectors to the inefficiency of the sector as a whole, but it is apparent that the latter owed much to the high cost of domestic milk production. A possible way to reduce inefficiency would be to reduce the output of this highly subsidized branch to a level that would meet the demand for those milk products that cannot be imported (notably milk for drinking) and to allow tradeable milk products to be imported. The required reduction in milk output could be achieved either by scaling down the production quotas of agricultural units or by allowing economic forces to decide the share of each unit in total milk supply.

MINING AND MANUFACTURING. The food processing industry received higher rates of effective protection and subsidy than the average for mining and manufacturing industries. Part of the reason was the negative value added in sugar refining and dairy products, but effective rates were also relatively high on products such as chocolate, instant coffee, wine, cigarettes, and vegetable oil. Most of the producers of these commodities had monopolistic control over their domestic markets, either directly (instant coffee) or through cartel arrangements (vegetable oil and cigarettes). In these cases, competition from imports was avoided through the imposition of prohibitive tariffs.

One subsector of the food processing industry that operated at low protection levels was citrus canning. This subsector exported a large part of its output and received subsidies much lower than the difference between the actual and the free-trade exchange rate. Canned vegetables and other fruits destined mainly for the domestic market, however, enjoyed high protection.

The textile industry received above average effective

Credit Subsidies			Investment Grants and Tax Exemptions			Effective Subsidies		
E	D	A	E	D	A	E	D	A
5	4	5	-2	-2	-2	29	60	50
-6	-6	-6	-2	-2	-2	7	16	10
-6	5	-0	-1	-0	-1	9	147	78
-1	-2	-1	-1	3	3	-37	269	223
-0	3	2	9	10	10	87	158	135
-7	-6	-6	-1	-0	-1	6	178	132
-0	-6	-6	-1	-2	-2	88	6	10
-4	0	0	1	13	12	2	102	95
-	-	-	-	-	-	-	-	-
-8	-7	-7	-2	-2	-2	23	51	50
4	6	5	8	4	5	33	175	148
9	38	26	-0	3	2	35	313	195
-4	-6	-6	-1	-1	-0	-12	28	28
-0	-	-0	-2	-0	-2	-3	-	-3
-6	-3	-3	1	7	7	10	118	116
-6	-6	-6	-2	-2	-2	-18	33	30
-7	-7	-7	-1	-2	-2	-3	21	20
-8	-6	-6	1	0	0	-14	91	84
9	-4	-4	-2	11	11	-	195	195
-9	-5	-5	-2	-2	-2	-	271	271
-1	-2	-2	-0	-2	1	15	89	70
1	0	0	-1	0	0	19	79	62

protection irrespective of the destination of its output. Textile exports received direct subsidies supplemented by payments from special industry funds: the Cotton Fund and the Synthetic Textiles Fund. These funds were financed from taxes on imported raw materials used to produce textiles for the domestic market. The high nominal protection of textile output more than offset the taxes and tariffs levied on inputs used in textile production destined for domestic markets. Effective subsidies on both exports and domestic sales of textiles were further raised by preferential credits, investment grants, and tax concessions received by the industry.

Part of the reason for the high protection accorded to the textile industry was the fact that its relatively low capital-labor ratio, large share of unskilled labor, and low transport costs made it a major instrument for the absorption of immigrants in development areas. After 1968, however, the high level of protection provided to textile industries (yarns and fabrics) that relied heavily on unskilled labor was gradually scaled down, so as to facilitate a switch to production of textile products (fashion goods) with a higher skill content.

The clothing industry, too, received above average effective protection. Here, however, export subsidies did not suffice to offset the high cost of domestic inputs so that, on balance, exports suffered discrimination compared with sales in domestic markets. At the same time, effective subsidy rates were lower than effective protection rates, which indicates that this industry received lower than average credit and tax benefits. Similar features characterized the leather industry.

Export subsidies were also provided to plywood, which is part of the wood products and furniture industry. Firms producing plywood were allowed to cartelize on condition that they exported a substantial part of their output. The cartel did not practice a two-price

policy because the nominal protection of exports and of sales in domestic markets was equally high. Given the high rate of subsidy to export value and the small share of value added, plywood manufacturing received very high effective protection. Protection rates were lower on other wood products and furniture sold domestically. Thus, in the industry as a whole, the average effective protection of exports was higher than that on domestic sales; it was even higher than the average effective protection rate on all manufacturing industries. These conclusions are not affected if consideration is given to credit and tax preferences.

In the other manufacturing industries, apart from diamonds, domestic sales received substantially higher effective protection and subsidy than export sales. In the paper and paperboard industry, protection was especially high for basic paper products, which were subject to prohibitive tariffs. The protection of inputs, in turn, prevented exports of final paper products. Domestic sales of final paper products were protected by high tariffs, in part to offset the high protection of their inputs.

Several mining products received export subsidies, but this was not the case for nonmetallic minerals, among which cement was the main product. The effective protection of both mining and nonmetallic mineral products sold in domestic markets was much below the overall average. These industries also suffered discrimination as far as credit and tax preferences were concerned.

The effective protection of the chemical industries, including rubber products, plastic products, pharmaceuticals, paints, glass, fertilizers, and various chemicals, was among the highest in Israel. The substantial discrimination against exports of these products may explain the declining share of automobile tires exported. Several new exports developed, however, including glass products and some chemicals, notably polyethylene and carbon black. Since the producers of these commodities had monopolistic control of their highly protected domestic markets, they could practice price discrimination between markets, selling exports at marginal costs.

Metal industries are a heterogeneous group that includes intermediate products, consumer durables, and investment goods. Among intermediate products, basic metals were highly protected, which raised the input costs for metal products. High input costs in turn reduced the effective rate of protection for metal products, so that the industry received less than the average overall protection. The only metal product exported in appreciable quantities was iron and steel tubes. The available data suggest that the few producers sold at different prices in domestic and export markets.

Consumer durables were highly protected to encourage the substitution of domestic products for imports. Products in this group (cars, washing machines, refrigerators, and television sets) were assembled in Israel mainly from imported components, so that net savings in foreign exchange were small.

Most of the investment goods produced by the electronic equipment industry, including electric motors, batteries, and accumulators, enjoyed higher than average effective protection and subsidies. By contrast, protection levels for industrial and agricultural machinery were kept low as part of an effort to encourage a high rate of investment in the economy and to provide protection to user industries. The tariff discrimination against domestically produced machinery in turn reduced the possibilities for import substitution and prevented the emergence of machinery exports. Yet Israel has a comparative advantage in exporting machinery by virtue of its skilled labor force.

In the group of miscellaneous products, data are available only for school and office supplies. The latter cannot be regarded as representative of a group that also includes scientific instruments, photographic and optical goods, watches, and jewelry.

Diamonds are a special case, since almost all production was exported. Diamond producers received a subsidy of 0.5 percent on export value in 1968 while their effective protection and subsidy rates were nil and −3 percent, respectively. Nevertheless, the rapid expansion of diamond exports was made possible by the immigration of entrepreneurs and skilled workers from the Benelux countries, who brought with them know-how and technical expertise as well as commercial connections.

Factors Explaining the Distribution of Incentives among Industries

The analysis of the factors determining effective subsidy rates has been restricted to manufacturing industries for two reasons. First, in agriculture directed credits were usually granted in accordance with the merits of agricultural units (communal farms or cooperative settlements, for example) that produced a fairly large number of products, rather than to firms producing a single product or a small range of closely related products, as was the case in the manufacturing sector. Second, to achieve its objectives with regard to the allocation of agricultural investments and output, the government relied less on financial incentives and more on administrative controls.

The preceding analysis of the factors determining the incentives to industry permits the following regression from pooled observations of data at the two-digit industry level for 1965 and 1968 (t values in parentheses):

Table 7.15. *Israel: Gross Domestic Product, Factors of Production, and Total Factor Productivity, 1951–70*
(average annual growth rates at 1955 prices)

	Gross Domestic Product	Factors of Production		Total Factor Productivity
		Labor	Capital	
1951 - 55	11.9	4.6	16.1	4.6
1956 - 60	10.6	4.1	11.0	4.3
1961 - 65	10.7	4.5	10.6	3.9
1966 - 70	8.6	1.8	7.0	4.8
1951 - 70	10.4	3.7	11.1	4.4

Note: Table excludes government services and housing.

Sources: 1951-65: A. L. Gaaton, Economic Productivity in Israel (Jerusalem, 1971), Table A-13, p. 205.

1966-70: Bank of Israel, Annual Reports.

$$ESR = \underset{(0.195)}{2645.5} + \underset{(4.936)}{0.44X} + \underset{(2.096)}{0.72\,O/L} - \underset{(-2.347)}{3174.6\,(O/L)} - \underset{(-1.562)}{0.08VAc} \qquad R^2 = 0.62$$

where *ESR* stands for effective subsidy rates, *X* for exports, *O/L* for output per worker in 1965, (*O/L*) for change in output per worker at an average annual rate between 1965 and 1969 in constant prices, and *VAc* for value added of firms in industries located in development areas.

The results of the regression analysis indicate that the independent variables listed explain a fairly large percentage of the variance of total incentives, and all the coefficients have the expected signs. The regression coefficients of two variables—exports (*X*) and the change in output per employee (*O/L*)—are significant at the 5 percent level, and the coefficients of *O/L* and *VAc* are significant at the 10 percent level. The first two variables contribute four fifths of the explained variance.[40]

The latter result contrasts with that obtained earlier, which showed effective protection rates for 1958–65 to be positively correlated with the rates of growth of labor productivity. It may be that while the government had taken account of past rates of productivity growth in granting incentives, in 1965–68 expectations were disappointed—productivity growth was slower in sectors that received high incentives. This result, in turn, is hardly surprising since high protection is not conducive to improvements in productivity.

It further appears that the system of incentives favored sectors in which labor productivity was low as well as those located in development areas. In the latter case, however, the high correlation obtained in regard to credit subsidies is weakened by the fact that effective protection rates and location were by and large unrelated.

Effects of the Incentives on Growth and the Allocation of Resources

With few interruptions, the Israeli economy maintained a rapid rate of economic growth during the post–World War II period. Table 7.15 shows that during the 1950s and 1960s real gross domestic product increased at an average annual rate of 10.4 percent. This rapid rate of growth was mainly, though not fully, attributable to the government's policies of encouraging immigration and of maintaining a high rate of domestic investment, largely financed by capital imports. Gaaton's analysis of factor productivity in the economy as a whole, and in

Table 7.16. *Israel: Actual and Expected Structure of Gross Domestic Product, 1955–70*
(percentage of GDP)

	Year	Actual	Norm	Difference
Primary Industries	1955	11.8	20.9	-9.1
	1960	12.2	18.0	-5.8
	1965	9.0	14.3	-5.3
	1970	7.2	11.4	-4.2
Manufacturing	1955	30.4	25.5	5.0
	1960	31.3	27.9	3.4
	1965	32.9	30.3	2.6
	1970	33.2	31.4	1.8
Service Industries	1955	51.2	43.2	8.1
	1960	46.9	43.3	3.6
	1965	48.2	43.9	4.3
	1970	49.1	45.0	4.2
Public Utilities	1955	9.0	10.4	-1.4
	1960	9.7	10.9	-1.2
	1965	9.1	11.6	-1.7
	1970	10.5	12.3	-1.8

agriculture and manufacturing, shows that the rise in output was not fully explained by increases in the inputs of capital and labor.[41] Attempts to explain the growth of total factor productivity, which contributed an average of 4.4 percent of the growth of GNP, by variables such as the increase in the skill level of the labor force and the rate of utilization of capital and labor, were not successful.[42]

Israel's Pattern of Growth

Both the overall rate of growth and the pattern of growth—the structure of the economy and its foreign trade orientation—are of interest. Several studies have attempted to establish a universal pattern of growth, which can be explained by relating certain independent variables, including the level of income per capita, the size of the economy, and the import surplus, to the structural characteristics of different economies at a given point of time.[43] For an economy such as Israel's, one may use the coefficients of the independent variables estimated by cross-country regression analysis to calculate the expected values of certain structural characteristics. If these expected values are considered normal by international standards, they can be compared with the actual values for the Israeli economy. Large deviations from the norm could be related either to the importance of natural resources in the economy or to government intervention in the process of economic development.

THE INDUSTRIAL STRUCTURE. When Israel's industrial structure is compared with the normal structure by international standards in Table 7.16, the small share of primary industries (mainly agriculture) in GDP stands out. Israeli agriculture was accorded high priority until the mid-1950s, but despite its rapid growth during the period of mass immigration and import substitution,[44] the share of primary production in GDP in 1955 at 11.8 percent was little more than half the norm of 20.9 percent predicted by the Chenery-Taylor study. After rising to a peak of 12.2 percent in 1960, this share again declined, reaching 7.2 percent in 1970. This decline was

due in part to the deteriorating terms of trade of agriculture in relation to the other industries, but it was also affected by a fall in agriculture's share of the fixed capital stock and of employment.

The small and declining share of agriculture reflects basic economic forces operating in Israel, including the limited supply of arable land and water for irrigation. Other contributing factors have been the low income elasticity of demand for agricultural products and the declining importance of agricultural development as a government policy objective. By 1965, the first year for which estimates of incentives have been made in this study, the total incentives granted to agriculture were lower than those granted to industry.

The share of manufacturing in GDP in 1955 (30.4 percent) was higher than its predicted share (25.5 percent). The actual share continued to increase afterward, but at a rate slower than predicted by the intercountry regression, so that by 1970 the gap between the actual share (33.2 percent) and the predicted one (31.4) had almost disappeared.

A study by Mandelbaum has shown that the industrial composition of the manufacturing sector in 1965 broadly corresponded to what may be regarded as a normal structure on the basis of Israel's per capita income, population, and the share of manufacturing in GDP at that time.[45] Also, an examination of the results does not reveal a relation between incentives and the deviations from normal patterns that are found by the study.

The relatively large share of the service industries reflects both the high public expenditures on health and education[46] and the relative importance of trading activities in Israel. Finally, the share of public utilities was somewhat smaller than predicted.

FOREIGN TRADE ORIENTATION. The protection of domestic industries tends to reduce the importance of foreign trade and to encourage an inward-oriented development pattern. This was the case in the early 1950s, when Israel accorded import substitution high priority. The rate of growth of imports from 1951 to 1955 was only a little more than half that of GNP (5.5 percent and 10.5 percent, respectively, in 1955 prices). The outward orientation beginning in the second half of the 1950s increased the dependence of the Israeli economy on foreign trade, but even so, between 1955 and 1970 imports grew slightly faster than GNP (9.8 and 8.9 percent, respectively). The share of imports used as inputs increased from 59 percent in 1951 to 63 percent in 1958, and remained at the same level in 1965.

In the 1950–70 period as a whole, exports grew considerably faster than GNP or imports. Compared with an annual real rate of growth of GNP of 9.1 percent, exports increased by 18.9 percent a year. The growth of exports was especially rapid during the 1950s, at 26.7 percent a year from 1951 to 1955 and 20.3 percent from 1956 to 1960; it averaged 12 to 13 percent a year during the 1960s.

The increased outward orientation of the Israeli economy, after a short initial period of import substitution at almost any cost, can be seen by comparing its actual dependence on foreign trade with what may be regarded as normal in terms of international averages (Table 7.17). Whereas in 1955 the share of Israel's exports in GDP was only half the predicted share, this lag almost disappeared by 1970 owing to rapid increases in exports. Over the same period, the share of industrial exports exceeded, and that of primary exports fell short of, their respective norms, although the differences narrowed.

Different conclusions apply to imports, which were financed to a considerable extent by foreign capital. In 1955 the share of actual imports in GDP fell slightly below the expected share, while from 1960 onward actual import shares exceeded normal shares and the gap widened over time. The particularly high level of total imports in 1970 reflected a sharp increase after 1967 for defense.

Changes in the foreign trade orientation of the economy are also indicated by an analysis of the determinants of the growth of output in the various sectors. The following causes of output growth from 1958 to 1965 have been distinguished: the growth of exports, import substitution, and the increase in domestic demand.[47] The results of this analysis are presented in Table 7.18.

For all industries together, the growth of exports explained about 22 percent of the total growth of output between 1958 and 1965, whereas import substitution explained only 8 percent. The total trade effects—the growth of exports together with import substitution—thus explain 30 percent of the growth of output from 1958 to 1965; domestic demand expansion accounts for the remainder.

The relative contributions of foreign trade and domestic demand to the growth of output varied considerably among industries. The trade effects were particularly strong in primary production. In agriculture both exports and import substitution contributed considerably to the expansion of output, whereas in mining there were no import substitution effects.

In manufacturing the influence of trade on output growth was similar to the average for the national economy. The contribution of import substitution to manufacturing output averaged 8 percent; the effects of exports on output growth (21 percent) can be attributed in large part to the diamond industry, which exported all its output; the effect of exports on growth in manufacturing industries other than diamonds was considerably smaller (14 percent). The growth of construction materials, consumer durables, beverages and tobacco, and

Table 7.17. *Israel: Actual and Expected Export and Import Shares*
(percentage of GDP)

	Year	Israel	Norm	Difference
Exports				
Total	1955	11.5	22.7	-11.2
	1960	18.9	25.5	-6.6
	1965	21.2	26.6	-5.4
	1970	26.6	27.0	-0.3
Primary	1955	4.4	13.5	-0.0
	1960	7.2	13.8	-6.5
	1965	6.7	12.3	-5.6
	1970	6.6	10.5	-3.9
Industrial	1955	7.0	9.2	-2.2
	1960	11.7	11.7	
	1965	14.5	14.3	0.2
	1970	20.0	16.5	3.5
Imports				
Total	1955	35.7	36.4	-0.7
	1960	37.4	35.9	1.5
	1965	40.5	37.0	3.5
	1970	52.9	39.4	13.5
Primary	1955	12.1	11.1	1.0
	1960	13.5	10.6	2.9
	1965	12.9	11.1	1.8
	1970	14.8	12.1	2.7
Industrial	1955	23.6	25.2	-1.6
	1960	23.9	25.3	-1.4
	1965	27.7	25.9	1.7
	1970	38.1	27.3	10.8

manufacturing of transport equipment was determined mainly by the growth of domestic demand. The trade effect was particularly pronounced in intermediate products I (mainly exports of textiles and crude oil refining) and processed food and machinery (mainly import substitution), aside from diamonds.

Import Substitution and Protection

Estimates for 1950–58 show that imports declined relative to total available supply. Import substitution was most pronounced in consumer goods, particularly those regarded as nonessential, the imports of which were therefore not eligible for foreign currency allocation. As a result, the share of consumer goods in total imports declined from 25 percent in 1950 to 12 percent in 1958.[48] Substantial import substitution also occurred in chemicals, textiles, and food processing, which were protected by severe import restrictions and high tariffs. Although there was import substitution in other more efficient branches (notably machinery), a disproportionate amount of capital was allocated to relatively inefficient branches of manufacturing.[49]

As stated earlier, there is no simple explanation of the

Table 7.18. *Israel: Contributions to the Growth of Output, by Industry Group, 1958–65*

	If Million (1965 prices)			Percentage of Output Expansion Owing to:				
	Domestic Demand Expansion	Export Expansion	Import Substitution	Domestic Demand	Export Expansion	Import Substitution	Trade Effect a/	Output Quantity Index, 1965:58
Agriculture, Forestry and Fishing (I)	265	113	54	61.4	26.1	12.5	38.6	141.3
Mining and Energy (IV)	58	50	-	53.7	46.3	-	46.3	353.9
Primary Activities (I&IV)	323	163	54	59.9	30.2	10.0	40.2	149.6
Processed Foods (II)	490	46	157	70.7	6.6	22.7	29.3	229.1
Beverages and Tobacco (III)	67	1	-11	117.8	1.7	-19.5	-17.8	194.0
Construction Materials (V)	133	2	2	96.9	1.5	1.6	3.1	210.7
Intermediate products I (VI A)	463	227	69	61.0	30.0	9.0	39.0	253.4
Intermediate products II (VI B)	557	74	30	84.3	11.1	4.6	15.7	263.9
Nondurable Consumer Goods (VII)	338	80	1	80.2	19.6	0.1	19.6	181.4
Consumer Durables (VIII)	187	2	-20	110.9	1.0	-12.0	-11.0	251.5
Machinery (IX)	96	7	40	67.2	4.6	28.2	32.8	290.4
Transport Equipment (X)	215	1	12	94.2	0.4	5.4	5.8	272.9
Diamonds	-7	302	1	-2.4	102.2	0.2	102.4	326.1
Manufacturing (II, III, V,-XI)	2,539	742	281	71.3	20.8	7.9	28.7	237.4
Manufacturing Less Diamonds (II, III, V-X)	2,546	440	280	71.9	13.5	8.6	22.1	232.8
All Industries (I-XI)	2,862	905	335	69.8	22.1	8.1	30.2	211.6

a/ Export growth plus import substitution.

basis on which the government set levels of protection for particular industries. Once an industry was established, however, the tendency was to maintain a rate of protection just high enough to cover its domestic production costs, so as to ensure that it survived the competition of imports. It will be recalled that the effective rates of protection granted to industries when quantitative restrictions were eliminated were positively correlated with their domestic resource costs; this correlation appeared to be a reflection of the government's policy to protect the status quo.

The granting of protection "to each according to his needs" was one reason a relatively small part of domestic output was exposed to competing imports and a variety of industrial products came to be produced domestically. A study of the structure of manufacturing industries in Israel from 1952 to 1962 points to the appearance of many new industrial activities in the process of industrial diversification during the 1950s.[50] According to the 1962 *Annual Report* of the Bank of Israel, the degree of diversification was in fact excessive.

The input-output tables for 1958 and 1965 allow import substitution in different industries to be analyzed in more detail on the basis of a distinction between (1) expected imports, defined on the assumption that imports supplied an unchanging percentage of total domestic demand for the given commodity between 1958 and 1965; and (2) import substitution, defined as the difference between expected and actual imports in 1965.

Table 7.18 shows import substitution between 1958 and 1965 for industry groups aggregated from more detailed calculations for 130 sectors. Import substitution contributing more than 5 percent of the increase in output occurred in 5 of the 10 industry groups and in 42 of the 130 sectors. In none of the 10 industry groups and in only 20 of the 130 sectors, however, did import substitution account for more than 30 percent of the increase in output. Quite substantial import substitution took place in the manufacture of foodstuffs and of intermediate products, such as spinning, weaving and knitting, basic chemicals, basic metals, and industrial and agricultural machinery. Industries where little import substitution or even negative import substitution took place after 1958 produced mainly semidurable and durable consumer goods: clothing, footwear, furniture, and household equipment. As noted above, in several of these industries, import substitution occurred in the early 1950s because of the severe quantitative restrictions on most consumer goods.

It has not been possible to investigate systematically the relationship between import substitution and changes in the level of protection of a given industry, since data on changes in import duties over time do not necessarily reflect changes in the levels of protection, both because of the administrative control of imports and tariff redundancy. It has, however, been possible to analyze the relationship at one point of time, for various sectors, between the share of imports in total availabilities and the effective rate of protection. The hypothesis tested was that the higher the level of protection of a given industry, the smaller would be the share of imports in domestic demand. This relationship can be expected to hold if the initial differences in efficiency between local producers and their foreign competitors are smaller than the difference in effective protection. When 1965 data were used, no such relation between levels of protection and import shares was found.

The relationship between changes in import shares from 1958 to 1965 and levels of effective protection in 1965 was also investigated. On the assumption that protection levels had remained unchanged throughout the period, it was hypothesized that import substitution between 1958 and 1965 was positively correlated with protection levels in 1965. Again, no significant association between the two variables was found.

Exports and Export Incentives

The growth of exports contributed 22 percent of Israel's total growth of output between 1958 and 1965 (Table 7.18). The average conceals large differences among industries. Thus, 74 percent of the increase in exports originated in industries in which export growth explained more than 40 percent of the increase in output. These were industries that contributed only 23 percent of the increase of output in the national economy.[51] At the other end of the scale, industries contributing 52 percent of the increase in output between 1958 and 1965 contributed only 7 percent of the increase in exports.

The relationship between export shares and rates of protection of export sales in 1965 has been investigated among sectors that exported less than 50 percent of their output. The hypothesis tested was that the higher the effective protection of export sales, the higher would be the share of exports in the sector's total output. This relationship can be expected to hold if initial differences in the relative efficiency of different industries are small, and therefore the main cause of differences in export shares is differences in protection. The regression results did not show a significant relationship between these variables, however.

The relationship between changes in export shares between 1958 and 1965 and effective protection rates in 1965 was examined under the assumption that rates of protection remained constant over time. The results for sixteen sectors that both exported and sold in the domes-

tic market show that the change in export shares is positively related to the effective protection rates of exports. The higher the protection of exports in 1965, the greater was the increase in the share of exports from 1958 to 1965.[52]

Similar results were obtained when effective rates of subsidy were used as independent variables. No significant relationship was found between effective rates of subsidy and export shares in 1965. Nevertheless, the change in export shares from 1958 to 1965 is positively related to effective rates of subsidy in 1965. For the sixteen sectors that both exported and sold in the domestic market, it was found that the higher the rate of total incentives to export sales in 1965, the greater was the increase in the share of exports in output from 1958 to 1965.[53]

Notwithstanding these results, exports remained less diversified in Israel than in most other countries at a similar stage of development. Thus, the share of citrus and diamonds, the two major Israeli export commodities, decreased during 1954–60 from 60 to only 50 percent and remained stable thereafter. The combined share of the eight main product groups other than citrus and diamonds remained at about 25 percent between 1954 and 1969.[54] These findings may be explained by the relatively small differences in export protection rates among industries and, in particular, by the lack of substantial discrimination against the traditional exports of citrus and diamonds.

A recent study investigated the effects of changes in the relative prices of exports on the growth rate of industrial exports, using the fixed capital stock in the manufacturing sector as an additional explanatory variable.[55] The estimated price elasticity of exports was between 0.68 and 0.88 if the price of exports relative to industrial prices was used in the regression equations, and between 1.13 and 1.19 if the price of exports relative to the implicit GNP deflator was used instead. The results thus emphasize the important effects of export incentives on exports, through changes in export prices.

During 1958–68 the exports of most sectors increased as a share of output (Table 7.19). The increase was most pronounced in mining and quarrying, where two thirds of output were exported by 1965, compared with less than half in 1958. Increases in export shares were smallest in agriculture, and manufacturing occupied the middle ground. Within manufacturing the largest increases were in textiles, clothing, and chemicals, which had export shares of 32, 16, and 22 percent, respectively, in 1968. By contrast, exports declined as a share of output in the rubber and plastics industry, including automobile tires, which had originally been produced for export and were increasingly oriented toward the protected domestic market. Declines occurred also in wood products and furniture and in nonmetallic minerals, where the rapid development of housing required an increasing share of output, as well as in paper and paperboard and in transport equipment.

The Factor Intensity of Exports and Import-substituting Industries

Estimates of the factor intensity of Israel's foreign trade in goods and services, reported in Table 7.20, indicate that exports remained more capital intensive than imports, although both became more capital intensive, over the 1958–65 period. Calculating the capital intensity of *competing* imports, as opposed to all imports, does not change the results significantly, as can be seen from a comparison of capital per man-day of competing imports (I£116.8) and all imports (I£117.5) in 1965.[56]

The higher capital intensity of exports as a whole was due mainly to the high capital intensity of shipping and aviation services, which used I£464 of capital per man-day of labor in 1965. The exclusion of shipping and aviation reduces the relative capital intensity of exports from 121.2 to 106.9 in 1958, and from 110.6 to 93.6 in 1965. Of the three major export industries—citrus, mining products, and diamonds—mining and citrus were highly capital intensive (I£305 and I£116 of capital per man-day of labor in 1965) whereas diamond production used only I£34 of capital per man-day of labor in 1965. Except for shipping, aviation services, citrus, mining, and diamonds, the remaining exports had a capital intensity similar to that of imports. While citrus and mining should properly be excluded from the calculations because of their natural-resource intensity, however, diamonds should be considered with other merchandise exports. Thus, given the high share of diamonds in the total, it would appear that Israel's merchandise exports other than citrus and mining products were relatively labor intensive.

Further interest attaches to considering unskilled and skilled labor separately. Mass immigration from Asian and African countries in the early 1950s increased the supply of unskilled labor with little education, but the percentage of the labor force with an academic education remained among the highest internationally. Hershkovitz's study shows that the percentage of unskilled labor in the total labor force was somewhat higher in export production (53 percent) than in the production of import substitutes (49 percent).[57] Professionals accounted for a slightly smaller share of the labor force in exports (9.1 percent) than in imports (10.2 percent). Apart from citrus and mining products, merchandise exports appear to have been intensive in both unskilled and professional labor.

Table 7.19. *Israel: Export Shares of Major Industries, 1958, 1965, and 1968*

		Percentage of Output Exported		
		1958	1965	1968
01-09	Agriculture, Forestry, Fishing	19.2	21.6	23.4
10-19	Mining and Quarrying	46.6	64.8	68.5
20	Processed Foods a/	21.4	25.7	36.3
21	Processed Foods b/	2.2	5.4	9.5
22	Textiles	9.9	22.2	32.0
23	Clothing	9.5	11.8	16.1
24	Wood, Furniture	11.3	8.0	8.6
25	Paper, Cardboard	6.8	5.0	3.8
26	Printing, Publishing	-	-	-
27	Leather	1.4	-	4.2
28	Rubber, Plastics	46.2	13.5	18.4
29	Chemicals	7.4	6.5	22.1
30	Nonmetallic Minerals	8.5	4.6	2.2
31	Diamonds	100.0	100.0	100.0
32	Basic Metal	1.0	3.7	3.0
33	Metal Products	0.2	-	4.6
34	Machinery	1.5	1.8	4.1
35	Electrical, Electronic Equipment	0.7	-	5.1
36	Transport Equipment	3.1	-	-
39	Miscellaneous c/	0.4	-	-
20-39	Total Manufacturing	14.4	18.1	25.1
20-39	Total Manufacturing excl. Diamonds (31)	9.4	10.2	15.1
01-39	Grand Total	15.8	19.6	24.6

a/ Livestock products, vegetables, oil products, processing of grains
b/ Sugar, chocolate, wine and spirits, beverages, tobacco.
c/ Scientific instruments and photographic equipment, watches, jewelry, religious goods.

Source: Input-output tables, Bank of Israel.

The Effects of Subsidized Loans on Investment

Two hypotheses of the effects of preferential medium- and long-term loans on investments may be considered. First, the subsidized loans reduce the *average* cost of capital to the firm, but because the loans finance only part of the firm's investments, the marginal cost of capital that the firm faces is equal to the equilibrium rate of interest. In this case, subsidized loans increase the firm's profits and thus the funds available for investment, but do not affect the marginal cost of capital. Alternatively, the subsidized loans are a predetermined part of the total medium- and long-term financial requirements of the firm and are granted under the condition that the firm supplements preferential financing from regular sources. In this case, the average cost of all funds (subsidized and regular) is also the marginal cost of capital to the firm, which is lower than the equilibrium rate of interest.

Available information suggests that the latter case was more typical during the period under consideration. A recent study of the determinants of manufacturing investment in 1955–68 provides some evidence on the effects of subsidized loans on investment activity.[58] The study traces the influence on gross investment (I) of changes in output, lagged by one year (ΔY_{t-2}), and the

Table 7.20. *Israel: Factor Intensity of Imports and Exports of Goods and Services, 1958 and 1965*

	1958		1965	
	Imports	Exports	Imports	Exports
All Industries				
Input of Capital (I£ million)	1,730	817	7,071	3,730
Input of Labor (thousand man-days)	39,364	15,331	60,155	28,716
Capital per Man-day of Labor (I£)	43.9	53.3	117.5	129.9
Relative Capital Intensity (Imports = 100)	100.0	121.4	100.0	110.6
Agriculture and Manufacturing (excl. Citrus, Mining, Diamonds)				
Input of capital (I£ million)	908	208	3,078	972
Input of Labor (thousand man-days)	26,273	5,898	35,512	11,514
Capital per Man-day of Labor (I£)	34.6	35.3	86.7	84.5
Relative Capital Intensity (Imports = 100)	100.0	102.0	100.0	97.5

size of government-directed and subsidized medium- and long-term loans, lagged by six (L_{t-1}) and eighteen (L_{t-3}) months, respectively, under the assumption that subsidized financing determines investment, and not vice versa. As indicated by the t values (in parentheses) the coefficients of both L_{t-1} and L_{t-3} are positive and significant. Their sum is 1.452, which means that for each Israeli pound extended in preferential loans, investment appears to have increased by more than one pound.

$$I_t = \underset{(4.80)}{133.8} + \underset{(0.82)}{0.102}\,\Delta Y_{t-2} + \underset{(2.36)}{0.659}\,L_{t-1} + \underset{(2.18)}{0.793}\,L_{t-3}. \qquad R^2 = 0.752$$

The same author obtained similar results from a cross-sectional analysis of the effects of directed medium- and long-term loans on investment. The following equation was estimated for a cross-section of nine industries, using the same notation as that in the equation above:

$$I_t = \underset{(0.78)}{4.92} + \underset{(2.39)}{0.74}\,L_{t-1} + \underset{(2.44)}{0.83}\,L_{t-3} + \underset{(1.66)}{0.68}\,L_{t-4}. \qquad R^2 = 0.71$$

In a time-series analysis of individual industries, the regression coefficients of at least one of the preferential loan variables are positive and significant for textiles, clothing, and leather; paper and paper products; printing and publishing; rubber and plastics; nonferrous metals and minerals; basic metals; machinery; and electrical equipment. Statistically significant results have not been obtained for food, wood products, and diamonds.

An alternative calculation has been made by regressing gross investment (I_t) on the subsidy equivalent of preferential loans lagged by one year (S_{t-2}). The effects of these subsidies on investment have been found to be *four* times their absolute value:

$$I_t = \underset{(9.72)}{187.7} + \underset{(6.83)}{4.1}\,S_{t-2}. \qquad R^2 = 0.726$$

It appears, then, that the positive effect of preferential financing on investment was several times greater than the contribution that it made to total profits and thus to the cash flow available for investment. The stimulus was greater in industries where subsidized loans were an important source of finance, and less noticeable when they were of minor importance.

Similar conclusions on the effects of investment incentives, and particularly on investments in new establishments, can be drawn from an inquiry among firms whose applications for the status of "approved investment" (under the Law for Encouragement of Capital Investment) were rejected. This enquiry showed that of the investors whose applications to establish a new firm were rejected, 73 percent did not go ahead with the investment. The availability of incentives had much less

effect on the expansion of existing firms. Among the investors applying for assistance in expanding their facilities, 71 percent of those rejected did proceed with the investment.[59]

It seems plausible to argue that, on the whole, development policy that subsidized capital formation increased the capital stock faster than would otherwise have been the case, by drawing on domestic and foreign savings. Subsidizing capital, relative to labor, had a twofold effect. First, it speeded up the increase in the total capital stock—a scale effect that enabled immigrants to be absorbed without a fall in real wages. Second, it secured a substitution effect in favoring more capital-intensive over less capital-intensive industries and production processes.

Earlier it was shown that the capital-labor ratio was positively related to the interindustry allocation of medium- and long-term loans, although the level of statistical significance of the relationship was low. There is also evidence that capital-intensive methods were favored in agriculture, in particular in the dairy and poultry industries, as well as in manufacturing.[60] It is also likely that the subsidy to capital investment led to excess capacity.[61]

Since the amount of subsidized loans relative to total investment varied greatly from industry to industry, it may be assumed that these loans reduced the cost of capital to each industry to a differing extent. Accordingly, one would expect relatively large differences in the marginal productivity of capital among industries; relatively high rates of marginal productivity of capital in industries where the cost of capital was higher, because these industries had to rely more on nongovernment sources in financing their investments; and a concentration of capital-intensive industries and, within industries, of capital-intensive enterprises producing for export in development areas, which benefited more from subsidized loans.

Production functions from which the marginal productivity of capital can be calculated were estimated for a number of industries. For others, the marginal productivity of capital can be deduced from the returns to capital under the assumption of constant returns to scale and competitive equilibrium. This procedure has been followed in the present investigation.

A study of rates of return in Israeli industries from 1965 to 1968 shows that rates of return on capital varied more widely in Israel than those similarly calculated in the United States. Correcting for differences in risk produces even larger differences: the coefficient of variation of rates of return in manufacturing industries was 0.69 in Israel, compared with 0.26 in the United States.[62]

As to the hypothesis that industries having greater access to preferential medium- and long-term loans will realize lower returns on the total capital invested, a statistical relationship between the two variables (after correction for differences in risk) could not be established. Textiles and basic metals stand out as industries that had low rates of return and benefited from the allocation of medium- and long-term credit. The chemical industry, which until 1964 did not depend heavily on public financing, by contrast enjoyed a relatively high rate of return on capital.

Government policy for the settlement of development areas was to establish public housing projects and to provide inducements for investments in these areas through preferential medium- and long-term loans and, after 1968, through investment grants and tax concessions. In 1963–67 directed loans extended by the three major industrial development banks financed about 55 percent of all investments in development areas, compared with 25 percent in developed areas.[63]

Although the population grew much faster in development areas than in developed ones, the bias in the incentive system ensured that productive investments in the development areas kept pace with the increase in the population. Furthermore, from 1963 to 1967 the share of the private sector in industrial investments in development areas increased from 31 to 44 percent.

The fact that the incentives in development areas were tied to the size of the investment in fixed assets meant that investments in these areas had higher capital-labor ratios than those elsewhere. First, there was a tendency to invest in relatively capital-intensive industries rather than in services and labor-intensive industries.[64] Second, within individual industries, investments in the development areas were concentrated in relatively capital-intensive enterprises. Thus, an analysis of investments in food and textiles, which accounted for about half of manufacturing investment, shows that the ratio of capital equipment to employee was higher in development areas than in developed areas.

In development areas the higher capital intensity of investments kept the creation of employment in new investments below the rate of increase of the population. While the share of development areas in the increment of productive investments and in the increase of the population was about the same (45 percent), their share in the growth of permanent employment attributable to new investments was considerably smaller (33 percent).[65] Unemployment existed in the development areas, despite the massive investments undertaken.

Evaluation and Policy Recommendations

In this chapter it was shown that the period up to the mid-1950s was characterized by import substitution be-

hind very high protection in Israel. Protection levels were reduced in the process of trade liberalization in subsequent years and export subsidies were also provided.

Export subsidies were reduced again in February 1962, however, in conjunction with the 67 percent devaluation of the Israeli pound, and they were not subsequently raised to earlier levels. Tariffs were lowered to a lesser extent, and thus the discrimination against exports increased in the incentive system as a whole.[66] Quantitative import restrictions were also reduced, but probably not enough to offset the decrease in export subsidies.

The latter conclusion is supported by the substantial anti-export bias shown in both 1965 and 1968. The data for these years tend to overstate the disincentives to exports during the late 1960s, for the reductions in export subsidies that accompanied the devaluations of 1964 and 1967 were temporary. It nonetheless appears that Israel's increased outward orientation was partly reversed during the 1960s. The bias against exports was moderated only in 1973 and 1974.[67]

The apparent reversal in the policy of outward orientation adopted in the 1950s may explain the lack of diversification of exports as well as the slowdown in the growth of exports during the 1960s. In its export growth rates, Israel fell behind the Far Eastern economies and, between 1966 and 1973, behind several Latin American countries as well (see Chapter 3).

Incentives in 1968 and Recommendations for Policy Changes

Earlier it was shown that the system of incentives changed little between 1965 and 1968, although the bias against agriculture and against exports was somewhat reduced. The following discussion concentrates on the incentives existing in 1968, with adjustment for the difference between the hypothetical free-trade exchange rate and the actual exchange rate (Tables 7.21 and 7.22). These estimates indicate whether a particular sector or industry received incentives or disincentives compared with the free-trade situation.

The results reported in Table 7.21 show the existence of discrimination against agriculture and, in particular, agricultural exports, although some branches of agriculture, including cattle, poultry, and cotton, received considerable net incentives, as already noted. Some have justified the discrimination against agriculture on the grounds that activities in which Israel has a natural comparative advantage can prosper even if subject to disincentives, and that such disincentives are necessary to avoid the excess profits that would otherwise be obtained, given Israel's limited agricultural land area. Such arguments fail to consider, however, either the possibilities of reallocating resources within agriculture or the superiority of a land tax over implicit taxation through the terms of trade between agricultural products and the rest of the economy.

A desirable reform of agricultural incentives would have involved reducing the incentives, chiefly protection, to those branches of agriculture in which Israel has a comparative disadvantage, and increasing the incentives to branches in which Israel has natural advantages. These changes in incentives would require increased reliance on the land tax as a source of revenue.

Mining products suffered even more discrimination than did agricultural exports. The need to capture rent in this industry may not have provided an adequate justification for these disincentives. In turn, effective subsidies were high on processed food, largely because protection escalated from inputs to outputs. As a result, the domestic processing of food received undue advantages; to achieve efficiency in resource allocation it would have been necessary to reduce the protection accorded to this sector.

Among other manufacturing industries, transport equipment, intermediate products at lower levels of fabrication, and consumer goods enjoyed the highest effective rates of subsidy. Inefficient firms were permitted to survive, and sectors receiving high incentives tended to show the least improvement in productivity. We thus find that, rather than helping new industries to catch up with established ones, high protection retarded their development.

Disincentives in manufacturing were largest for construction materials and machinery. While incentives may be of little importance for materials having high transport costs, they apparently had adverse effects on exports of cement. For machinery, the disincentives prevented the emergence of exports in an industry in which Israel has a comparative advantage because of the availability of skilled labor. There also appears to have been excessive discrimination against diamond production and exports, which similarly rely on skilled labor.

Under such conditions, it would be desirable to make incentive rates in the manufacturing sector more uniform. In addition, it would be necessary to reduce the bias against exports. Such a bias existed against both traditional and nontraditional exports and, among nontraditional industries, in agriculture as well as in manufacturing. The suggested changes would thus permit an acceleration of export growth and higher rates of increase of GNP.

Table 7.21. *Israel: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1968*
(percent)

	Net Nominal Protection			Net Effective Protection (Balassa)			Net Effective Subsidy (Balassa)		
	E	D	A	E	D	A	E	D	A
Agriculture, Forestry, and Fishing (I)	-25	-16	-18	-18	-1	-6	-21	-2	-8
Mining and Energy (IV)	-26	-21	-24	-30	-30	-30	-25	-24	-25
Primary Activities (I&IV)	-25	-17	-19	-21	-3	-9	-22	-4	-10
Processed Foods (II)	-27	-8	-13	-32	85	39	-27	80	38
Beverages and Tobacco (III)	-26	-12	-12	-11	2	2	-7	7	6
Construction Materials (V)	-	-25	-25	-	-29	-29	-	-24	-24
Intermediate Products I (VI A)	-5	-6	-5	36	13	16	28	11	14
Intermediate Products (VI B)	-26	-8	-11	-26	10	6	-33	8	3
Nondurable Consumer Goods (VII)	-18	15	6	-32	38	20	-29	41	23
Consumer Durables (VIII)	-27	4	3	-54	22	19	-51	25	22
Machinery (IX)	-27	-22	-22	-36	-28	-28	-31	-22	-22
Transport Equipment (X)	-	4	4	-	76	76	-	72	72
Diamonds (XI)	-33	-	-33	-34	-	-35	-33	-	-33
Manufacturing (II, III, V-XI)	-27	-5	-12	-26	14	4	-26	14	4
All Industries (I-XI)	-27	-8	-13	-24	9	0	-24	9	0

Table 7.22. *Israel: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1968*
(percent)

	Nominal Protection			Effective Protection (Balassa)			Effective Subsidy (Balassa)		
	E	D	A	E	D	A	E	D	A
Export Industries	-28	-3	-20	-26	5	-14	-25	5	-14
Traditional	-31	-25	-31	-27	-19	-26	-27	-20	-26
Nontraditional	-20	0	-8	-23	10	-2	-20	10	-1
Primary	-25	-28	-27	-21	-28	-24	-22	-29	-25
Traditional	-26	-25	-26	-19	-19	-19	-21	-20	-20
Nontraditional	-25	-30	-28	-27	-33	-31	-23	-34	-30
Manufacturing	-29	12	-18	-30	49	-4	-28	50	-3
Traditional	-33	-	-33	-35	-	-35	-33	-	-33
Nontraditional	-19	12	0	-21	49	21	-19	50	22
Export-and-Import-Competing Industries	-19	-6	-9	-16	24	14	-18	24	14
Primary	-25	-27	-26	-8	-19	-18	-11	-20	-19
Manufacturing	-18	-5	-8	-15	30	19	-18	31	19
Import-Competing Industries	-27	-8	-9	-36	6	5	-43	6	5
Primary	-	-15	-15	-	-17	-17	-	-18	-18
Manufacturing	-27	-8	-8	-36	11	11	-43	12	11
Non-Import-Competing Industries	-27	-10	-10	-13	5	5	-16	5	5
Primary	-24	-9	-9	-13	28	27	-16	26	26
Manufacturing	-28	-10	-11	-13	-6	-6	-17	-6	-6
All Industries	-27	-8	-13	-24	9	0	-24	9	0
Traditional	-31	-25	-31	-27	-19	-26	-27	-20	-26
Nontraditional	-20	-7	-9	-20	10	6	-20	10	6
Primary	-25	-17	-19	-21	-3	-9	-22	-4	-10
Traditional	-26	-25	-26	-19	-19	-19	-21	-20	-21
Nontraditional	-25	-16	-17	-26	-1	-5	-23	-2	-5
Manufacturing	-27	-5	-12	-26	14	4	-26	14	4
Traditional	-33	-	-33	-35	-	-35	-33	-	-33
Nontraditional	-19	-5	-7	-18	14	9	-18	14	10

Note: Apart from the export industries category, where citrus and diamonds have been classified as traditional primary and traditional manufactured exports, respectively, all other productive activities have been classified as nontraditional.

Notes to Chapter 7

1. Importers did not realize these quota profits in all cases, partly because of price controls and partly because some imports were by nonprofit institutions (such as government departments and medical institutions).

2. A. Gafni, N. Halevy, and C. Hanoch, *Israel's Tariff Structure and Functions*, Falk Project Research Paper, no. 3 (Jerusalem: Maurice Falk Institute for Economic Research in Israel, 1958; in Hebrew), p. 17.

3. Such calculations have been made by Michael Michaely in *Foreign Trade Regimes and Economic Development: Israel* (New York: National Bureau of Economic Research, 1975). Michaely also reports effective exchange rates for exports. While the effective exchange rate for imports relates to import *value*, however, that for exports relates to *value added*. Given the resulting bias in the comparisons, the omission of quota premiums for imports, and the lack of inclusion of export incentives other than direct subsidies, estimates of effective exchange rates are not presented in the present study.

4. Howard Pack, *Structural Change and Economic Policy in Israel* (New Haven, Conn.: Yale University Press, 1971), p. 118.

5. Ibid., pp. 73–83.

6. Marshall Sarnat, *The Development of the Securities Market in Israel* (Basel: Kyklos Verlag, 1966), pp. 39–48.

7. For a detailed discussion of these changes, see Bank of Israel, *Annual Report, 1962* (Jerusalem, 1963), pp. 224–34.

8. The following discussion is based on V. D. Amiel, "Effective Rates of Exchange in Israel's Foreign Trade, 1962–1970," *Bank of Israel Economic Review*, no. 39 (August 1972), pp. 28–53.

9. The following discussion is based on I. Tov, "Import Liberalization Policy in Israel, 1962–67," *Bank of Israel Economic Review*, no. 37 (March 1971).

10. Ibid.

11. N. Halevy, "Economic Policy Discussion and Research in Israel," *American Economic Review*, suppl. (September 1969), pp. 92–95.

12. Michael Bruno analyzed the export promotion system of Israel in 1958 on the basis of the domestic resource cost criterion but made no price comparisons for imports (*Interdependence, Resource Use, and Structural Change in Israel* [Jerusalem: Bank of Israel, 1963]).

13. Detailed results of this study have been published separately in Joseph Baruh, *Structure of Protection in Israel, 1965 and 1968* (Jerusalem: Bank of Israel, 1976). The discussion in this section of protection in 1965 is based on this work of Baruh.

14. The available breakdown of the output data was based on a four-digit Brussels Tariff Nomenclature and five-digit Standard International Trade Classification.

15. Local tradeable outputs and imports were matched for 1965 and 1968 on the basis of a four-digit BTN classification, and competing imports were identified by means of the 10 percent rule.

16. It is obvious that had domestic products and imports been compared at a still greater level of disaggregation, the results would have been even more striking. However, too great a level of disaggregation into commodities having a high elasticity of substitution among them would make the categorization less meaningful.

17. In 1965 these industries were cotton (015), 18 percent; fruit and vegetable canning (203), 26 percent; margarine and oil products (204), 6 percent; wine industries, distilling, and blending of spirits (222), 12 percent; oil distilling (217), 0 percent; clay and lime (300), 10 percent; diamonds (310), 0 percent; tinware and other fabricated metal products, excluding cooking equipment (331), 18 percent; structural metal products (335), 29 percent; and agricultural machinery (341), 2 percent.

18. The tables are for fiscal years, starting in April and ending in March. Thus the 1965 table is actually for April 1, 1965, to March 31, 1966, and the 1968 table for April 1, 1968 to March 31, 1969.

19. The changes in effective protection rates caused by the adjustments were particularly large in the following cases: cattle meat (from 789 to 233 percent), milk products (from negative value added to 1,190 percent), and cotton and woolen fabrics (from 630 to 220 percent).

20. The relation between the two rates is closer for industries having an effective rate of protection below 100 percent, which are less sensitive to variations in measured value added. Thus, a regression for fifty industries having effective rates below 100 percent gave the following result (t values in parentheses):

$$EPR = \underset{(-3.353)}{-48.991} + \underset{(12.782)}{1.466\,NPR}. \quad R^2 = 0.768$$

21. Export subsidies, however, did not always compensate for the protection of inputs. Under the drawback system, customs and other import taxes were refunded on direct tradeable inputs used in export production. No refunds were available for tariffs on imports used in the domestic production of inputs for exports.

22. Israeli Ministry of Commerce and Industry, *A Forecast of Developments of Israel's Manufacturing, 1960–1965* (Jerusalem, 1966; in Hebrew), pp. 25–26.

23. Tov, "Import Liberalization Policy in Israel, 1962–1967," p. 53.

24. Other definitions of labor intensity were tried (such as the share of wages in value added and the share of wages in output per salaried worker), but they did not modify the results.

25. Applying the equilibrium exchange rate instead of the official one to the capital account has two effects: it increases capital imports, and therefore the equilibrium deficit, and increases the demand pressure from capital account transfers and foreign currency deposits held by the public. Whereas the first effect reduces the overvaluation below the one presented here, the second leads to a higher level of overvaluation. Both effects have been ignored here.

26. Nadim Halevy, "Effective Devaluation and Exports: Some Issues in Empirical Analysis, with Illustrations from Israel," *Economica* (August 1972), pp. 252–56.

27. This section is to a large extent a summary of V. Medina, "The Cheap Credit Granted at the Direction of the Public Sector and Its Impact on the Israeli Economy."

28. No distinction between direction by the Bank of Israel or by ministries will be made in this study, and credit allocation by both will be referred to as government directed.

29. Regressions with output and value added of the industry showed that neither of these variables, which indicate the level of total activity of the industry, was significantly related to the dependent variable.

30. A somewhat indirect way of quantifying the effect of the location of the investment on the amount of directed loans granted is to compare the size of the coefficients of investments in existing enterprises in development areas with that of the coefficient of such investments in all areas. Such a comparison shows that an investment in an existing enterprise in development areas would be granted more directed credit (0.52 ± 0.17) than an average investment in existing enterprises in all areas (0.15 ± 0.006).

31. Z. Auerbach, "Factor Use in the Metal and Textile Industries," *Bank of Israel Economic Review*, no. 39 (August 1972); M. Bruno, "Estimation of Factor Contribution to Growth under Structure Disequilibrium," *International Economic Review*, vol. 9 (February 1968).

32. H. Ben Shahar, *Interest Rates and the Cost of Capital in Israel 1950–1962* (Basel: Kyklos, 1965).

33. E. Gabai and M. Tamari, "Some Effects of Differential Income Tax on the Behavior of the Israeli Manufacturing Companies," *Bank of Israel Economic Review*, no. 42 (January 1974).

34. The corporate profits tax for nonapproved enterprises was raised to 30 percent in 1966. In 1970 the corporate profits tax for both approved and nonapproved enterprises was raised to 33 percent.

35. An approved enterprise received an allowance for accelerated depreciation at double the rate for a nonapproved enterprise. However, since this concession was limited to the first five years of use of the machinery and in at least part of this period the enterprise would probably not show any profits, not

all approved enterprises derived actual benefits from this concession.

36. Since in most cases there was no separation between ownership and management, the highest marginal income tax rates were used in the calculation. The estimate is biased downward because the tax liabilities were calculated only for approved corporations, which were exempted from the corporate income tax on dividends, although some other corporations were also exempted. Another source of downward bias is the fact that the survey did not cover all small corporations, although here the margin of error is likely to be small.

37. Part of these expenditures are more in the nature of a subsidy to education as a final consumption good.

38. M. Hershkovitz, "The Heckscher-Ohlin Theorem and Factor Intensity in Israel's Foreign Trade 1958, 1965," M.A. thesis, Hebrew University, Jerusalem, 1974, chap. 4.

39. Cattle farming also produces a nontradeable commodity, milk, which will be considered in conjunction with tradeable milk products.

40. A regression with only X and $(\dot{O}/L)$ as independent variables has almost the same explanatory power as the fully specified equation, although $(\dot{O}/L)$ is less significant (t values in parentheses):

$$ESR = \underset{}{14373.9} + \underset{(1.361)}{0.42X} - \underset{(5.758)}{2588.7}\,\underset{(-1.844)}{(\dot{O}/L)}. \qquad R^2 = 0.57$$

41. A. L. Gaaton, *Economic Productivity in Israel* (Jerusalem, 1971).

42. Y. Menzly, "Measurement of Productivity and Sources of Private Product Growth, 1950–1967," *Bank of Israel Economic Review*, no. 35 (November 1970), pp. 46–48.

43. See, for example, H. B. Chenery and L. Taylor, "Development Patterns among Countries and Over Time," *Review of Economics and Statistics*, vol. 50 (November 1968).

44. The severance of trade with the Arab countries in 1948 increased the "natural" protection of a number of agricultural products, such as fresh fruits, vegetables, and dairy products, which before 1948 had had to compete with imports from Israel's neighbors.

45. M. Mandelbaum, "The Structure of Israeli Industry and Expected Changes in Exports," *Economic Quarterly*, no. 57–58 (September-December 1975), pp. 146–156. See also United Nations' Department of Economic and Social Affairs, *A Study of Industrial Growth* (New York, 1965).

46. G. Ofer, *The Service Industries in a Developing Economy: Israel as a Case Study* (New York: Praeger, 1967), pp. 60–69.

47. In decomposing output growth into the effects of exports, import substitution, and domestic demand, the following equation was used:

$$X_{65} - X_{58} = E_{65} - E_{58} + (\mu_{58} - \mu_{65})D_{65}$$

Growth of Output = Increase in exports + Import substitution + $(1 - \mu_{58})\cdot(D_{65} - D_{58})$, Increase in domestic demand

where μ refers to the share of imports in domestic demand.

48. N. Halevy and M. Michaely (eds.), *Studies in Israel's Foreign Trade* (Jerusalem, 1972), p. 104.

49. Pack, *Structural Change and Economic Policy in Israel.*

50. E. Kleiman, "The Structure of Israeli Manufacturing, 1952–1962" (processed), pp. 38–41.

51. On the importance of diamond exports, see above.

52. The regression equation estimated was (t values in parentheses):

$$A = \underset{(-3.376)}{-19.557} + \underset{(6.671)}{19.829\,EPR} \qquad R^2 \text{ adj.} = 0.744$$

where $A = \dfrac{\text{Exports 1965}}{\text{Output 1965}} \Big/ \dfrac{\text{Exports 1958}}{\text{Output 1958}}$

EPR = effective protection rate on export sales in 1965.

53. The regression equation estimated was (t values in parentheses):

$$A = \underset{(3.580)}{-19.997} + \underset{(7.012)}{19.323\,ESR} \qquad R^2 \text{ adj.} = 0.763$$

ESR = effective subsidy rate on export sales in 1965.

54. D. Amiely, "Concentration of Israel's Commodity Exports, 1954/69," *Bank of Israel Economic Review*, no. 40 (September 1973).

55. Halevy, "Effective Devaluation and Exports."

56. Hershkovitz, "Heckscher-Ohlin Theorem and Factor Intensity in Israel's Foreign Trade 1958, 1965."

57. Ibid.

58. A. Ben-Bassat, "Industrial Investment Behavior in Israel, 1955–1968," *Bank of Israel Economic Review*, no. 42 (January 1974).

59. M. Tamari, "Some Effects of Differential Income Tax Rates on Corporate Financial Behavior," *Bank of Israel Economic Review*, no. 42 (January 1974).

60. Pack, *Structural Change and Economic Policy in Israel.*

61. Bank of Israel, *Annual Report 1962* (Jerusalem, 1963), pp. 24–256. A recent study by David Morawetz, *Capital Utilization in Israeli Industry*, Discussion Paper, no. 753 (Jerusalem: Maurice Falk Institute for Economic Research in Israel, June 1975), concludes that capital utilization rates were significantly lower in Israel than in the other three countries in which an identical study was carried out—Colombia, Malaysia, and the Philippines. The study concludes that the provision of cheap capital to industry has caused overexpansion of capacity together with low utilization (pp. 121–25).

62. A. Bregman, "Rates of Return in Manufacturing Industries in Israel During the Business Cycle (1965 to 1968)," *Bank of Israel Economic Review*, no. 41 (April 1974), pp. 52–67. For the United States, see G. R. Conrad and I. H. Plotkin, "Risk Return: US Industry Pattern," *Harvard Business Review* (March-April 1968), pp. 90–99.

63. J. Berkovitch and others, "Investment and Induced Employment in the Development and Coastal Districts," *Bank of Israel Economic Review*, no. 36, pp. 3–27.

64. Ibid., p. 22.

65. That is, not taking into account the short-term employment created during the construction period.

66. Michaely, *Foreign Trade Regimes and Economic Development: Israel*, table 5-1.

67. Joseph Baruh, "Protection Levels in Israel, 1968 and 1972–74," *Bank of Israel Economic Review*, no. 45-46 (February 1979), pp. 1–22.

8

Korea

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The Republic of Korea, often referred to as South Korea and here simply as Korea, was created at the end of World War II by the partition of the Korean peninsula, which had been occupied by Japan since the early 1900s. Under Japan's colonial administration, agriculture had been intensively developed in the southern half of the peninsula to promote exports of food to Japan. There was little industrial development beyond traditional activities until 1920, when a law requiring administrative approval for the establishment of new firms was abolished. The growth of manufacturing accelerated further after 1930, owing to a change in Japanese policy that greatly favored imports from within the Yen Bloc. Thus by 1940 the South had a modest but significant modern manufacturing sector, concentrated in light industries and machinery production. Most of the heavy industry and more than 90 percent of the electricity generating capacity were in the North.

Partition in 1945 left South Korea with a majority of the peninsula's population, its most productive agricultural land, and the bulk of its light industry. Japanese colonial occupation had almost destroyed the landed aristocracy that had previously ruled Korea, and a far-reaching land reform initiated by the U. S. occupation government after Word War II was completed by the Korean government in 1952. This reform, along with the economic dislocation caused by the wars and the departure of the Japanese, produced a relatively egalitarian distribution of assets throughout the society. In addition, Korea inherited from its Confucian past a culture in which a very high value is placed on education.

Adjustments first to partition and then to dislocations caused by the Korean War meant that the structure of the South Korean economy in 1955 was much the same as it had been at the end of the Japanese occupation. As may be seen in Table 8.1, manufacturing activity accounted for only 8 percent of GNP in 1955, while nearly half of GNP originated in the primary sectors. Because of the disruptive effects of the Korean War, exports accounted for only 1.4 percent of GNP, and manufactured exports were almost nonexistent.

Korea's industrial expansion from 1955 through the early 1960s was oriented largely toward the domestic market. Import substitution in light manufactured and nondurable consumer goods played a major role. Exports in 1956 amounted to less than half their real value in 1950, the year in which the Korean War began. In the late 1950s the growth of exports began to accelerate gradually so that by 1960 their real value surpassed that in 1950 by nearly 16 percent. In absolute terms as well as in relation to GNP, however, exports in 1960 remained small. In current U.S. dollars, total exports (of goods and nonfactor services) amounted to about US$100 million, of which only 6 percent consisted of manufactured

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Table 8.1. *Korea: Major Economic Indicators, 1955–75*

Indicator	1955	1960	1965	1970	1975
Computation of GNP per Capita					
GNP (thousand million won; 1970 prices)	938.2	1,129.7	1,529.7	2,589.3	4,107.7
Population (million persons)	21.5	24.9	28.3	31.4	34.7
GNP per Capita (thousand won; 1970 prices)	43.6	45.3	54.0	82.4	118.4
Percentage Shares of GNP (1970 prices)					
Value Added in:					
Primary Production	47.5	42.6	41.0	29.2	23.0
Manufacturing	7.9	10.8	13.9	21.6	31.9
Social Overhead a/	4.2	6.0	8.5	13.3	13.7
Services	40.4	40.6	36.6	35.9	31.4
Gross Investment	10.0	8.6	12.9	27.2	26.3
Exports of Goods and Nonfactor Services	1.4	2.4	5.2	14.7	28.3
Imports of Goods and Nonfactor Services	11.2	10.4	9.8	24.8	27.2
Percentage Shares of GNP (current prices)					
Government Revenue	10.5	19.8	16.1	20.1	19.7
Government Savings	0.6	4.1	5.7	7.5	3.6
Total Domestic Savings	3.7	1.6	7.7	17.1	17.7
Gross Investment	11.9	10.9	15.1	27.2	27.1
Exports of Goods and Nonfactor Services	1.6	3.3	8.5	14.7	30.2
Imports of Goods and Nonfactor Services	9.8	12.6	15.9	24.8	39.6

Compound Annual Growth Rates (percent)	1955-60	1960-65	1965-70	1970-75
GNP (1970 prices)	3.8	6.2	11.1	9.7
GNP per Capita (1970 prices)	0.7	3.6	8.8	7.5
Manufacturing Value Added (1970 prices)	10.3	11.8	21.3	18.5
Index of Manufacturing Output	12.0	9.5	24.2	23.2
Total Exports (1970 prices)	16.3	24.0	36.5	25.0
Population 14 Years and Older	n.a.	2.5 c/	2.8	3.6
Economically Active Population	n.a.	2.7 c/	2.9	3.9
Employment				
Total	n.a.	2.4 c/	3.5	3.9
Manufacturing	n.a.	12.2 c/	10.7	11.4
Real Wages				
Average in Mining and Manufacturing	5.1 b/	1.1	7.1	8.4
Agricultural Labor	n.a.	-0.1	8.2	1.5
Prices				
GNP Deflator	12.0	19.3	13.7	15.3
Wholesale Price Index	10.2	17.2	7.9	18.9

n.a. Not available.

Note: Figures may not reconcile because of rounding.

a/ Includes construction; electricity, gas, water, and sanitary services; transport, storage, and communication.
b/ For 1957–60.
c/ For 1960–66.

Sources: Bank of Korea, Economic Statistics Yearbook, 1967, 1969, 1976; Bank of Korea, National Income in Korea, 1975; Economic Planning Board, Korea Statistical Yearbook, 1975; and Wontack Hong, Factor Supply and Factor Intensity of Trade in Korea (Seoul: Korea Development Institute, 1976).

products;[1] the share of total exports in GNP at current prices was only 3.3 percent.

Manufactured exports rose rapidly in the early 1960s, albeit from a small base, but the real turning point in both export and industrial growth occurred around 1965, at the end of a period of trade liberalization and other major policy reforms. In the following decade, manufactured export growth coupled with rising domestic demand fueled industrialization much faster than before. The compound annual rate of growth in the index of manufacturing output was 11 percent from 1955 to 1965; it increased to 24 percent from 1965 to 1975. Underlying this acceleration, the share of exports in manufacturing (gross) output, which was nil in 1955, rose from about 6 percent in 1965 to almost 25 percent in 1975.[2] Within the decade 1965–75, the ratio of total exports to GNP more than trebled and the share of GNP originating in the manufacturing sector more than doubled. Manufactured products constituted 42 percent of total exports in 1965 and 74 percent in 1975.

Almost every indicator of development performance improved dramatically after the mid-1960s (see Table 8.1). The annual growth rate of real per capita income increased from 2.1 percent in the decade before 1965 to 8.1 percent in the decade that followed. By 1975 Korea's population of more than 34 million enjoyed a per capita income in excess of US$500 (in current U.S. dollars). The economy also performed well with respect to employment and income distribution. Between 1965 and 1975 total employment is estimated to have increased by 3.7 percent a year, while the population aged fourteen years and older was growing at 3.2 percent annually. Real wages in mining and manufacturing rose at an average annual rate of 7.8 percent during this period.[3]

Industrial incentive policies, particularly those affecting import substitution and export expansion, played a major role in Korea's economic transformation. This study seeks to quantify that role. To trace the full impact of government incentive policies through the economy, nominal and effective incentive rates are given for 150 sectors in a single year, 1968. The more general discussion of industrial policy and development covers the period from 1955 through 1975.

This chapter opens with a brief history of changes in incentive policy, with emphasis on the reforms undertaken between 1959 and 1967. It also presents estimates of the real effective exchange rates for exports and imports that extend through 1975. After a detailed discussion of the estimates of nominal and effective incentive rates in 1968, the changes that have taken place in the structure of Korea's trade and production are analyzed. Changes in factor allocation and use and the relation between incentives and structural change are considered next. The final section summarizes some of the major findings of the chapter and attempts to evaluate Korea's industrialization strategy.

Incentive Policies for Exports and Import Substitution

The history of Korean incentive policy changes is one of continual, if sometimes halting, movement toward an increasingly open economy, marked by major liberalization in the mid-1960s.[4] During the late 1950s a multiple exchange rate system and import controls had heavily protected the domestic market. The resulting discrimination against exports was partly offset, though to what degree is unknown, by permitting exporters to convert their foreign exchange earnings in a free market.

The policy change most important for opening the economy was the adoption of a uniform exchange rate at a level near the free-trade exchange rate. This took place in two stages between 1961 and 1964. The adoption of new export incentives had started somewhat earlier, in 1959, and continued through 1967. In turn, as the balance of payments situation improved after 1964, import controls were progressively relaxed—a process that still continues.

The principal instruments of industrial incentive policy remained unchanged from 1967 to 1973, when several export incentive mechanisms were abolished after an exchange rate adjustment. The changes introduced in 1973 are summarized in the discussion of trends in effective exchange rates at the end of this section.

The Evolution of Incentive Policies through 1967

Industrial incentive policies during the late 1950s were those typically associated with an import-substitution strategy. Large-scale purchases of Korean won (W) at the official exchange rate by the resident U.N. military establishment provided the main motivation to maintain an overvalued exchange rate, from which a complex structure of multiple exchange rates evolved to deal with recurrent balance of payments problems. Foreign exchange rates varied depending upon the type of import and the source of the foreign exchange, and advance deposits were required in some cases. Foreign exchange was allocated by various auction and bidding procedures, by lottery, and by an exchange tax system.

High tariffs were imposed on imports—mainly finished consumer goods—for which close substitutes were domestically produced; tariffs were lower on products without Korean substitutes. Low tariffs were levied on unfinished goods and high tariffs on finished goods and luxury items. Food grains and noncompetitive imports of equipment and raw materials entered free of duty. In addition, several major import-substituting industries were exempted from tariffs on imports of machinery and intermediate goods. The government relied more and more upon quantitative import restrictions as an additional measure to offset the progressively greater overvaluation of the won. Quotas were the principal means of controlling imports. The import licensing program was revised semi-annually and changed in fundamental respects several times to reduce pressure on the balance of payments.

As for the various incentives that were nonetheless given to exports, by far the most important was the provision for converting export earnings into foreign exchange certificates that were traded at a premium in a free market. Through the export-import-link system, holders of foreign exchange certificates were entitled to import certain popular items not otherwise approved for import. Exporters also received direct subsidies in won, at rates that depended upon the type of export, and a

small subsidy in the form of loans at preferential interest rates. Since 1959, imports of intermediate goods used in the production of exports have been exempt from tariffs.

In the three years after the student revolution that overthrew Syngman Rhee in April 1960, social, political, and economic instability led to several attempts at policy reform and economic liberalization. The most notable of these was the initial reform of the exchange rate in 1961. Although double the former official rate, the new uniform fixed rate of W130 to the dollar did not appreciably increase export proceeds, since it was somewhat lower than the free-market rate on export earnings had been. The unit cost of imports was raised by more than 40 percent.

Import controls were relaxed somewhat after the devaluation in 1961, but were then tightened in response to continued domestic inflation through the use of import licensing under the semi-annual trade programs, which included selective import quotas and prohibitions. Variable tariffs had been used as an additional means of controlling imports before the devaluation, but were not as important afterward. Export incentives were increased. The preferential interest rate on export credit was gradually reduced, and the amount that could be borrowed for a given volume of exports was increased. Several new measures were also added, the most important of them in 1962 when the business income tax rate on foreign exchange earnings was set at half the otherwise applicable rate, and exporters formally received full exemption from indirect taxes both on inputs and export sales.

Until a balance of payments crisis developed in 1963, exporters were obliged to sell their foreign exchange receipts to the central bank at the legal exchange rate. But, when a multiple exchange rate system was reintroduced in 1963—it continued into 1964—exporters were again permitted to sell all their foreign exchange earnings on the free market. Under an export-import-link system in force during this period, imports of a large number of otherwise prohibited items could be financed only by export earnings. (Other imports were financed by official transfers.)

The liberalization philosophy that had emerged but remained largely ineffectual during the early 1960s took firm hold after the election of a civilian government under Chung Hee Park in early 1964. (Park was president until his assassination in 1979.) The ensuing two years brought significant and successful policy changes. In addition to changes more directly related to trade policy, several key reforms aimed at increasing public and private savings. The administration of government revenue collection was reorganized to ensure a high ratio of revenue to GNP, and steps were taken to hold down current government expenditures. An increase in commercial bank deposit and lending rates, together with a price stabilization program, raised the real interest rate to approximately 10 percent a year. By substantially increasing the domestic savings rate (see Table 8.1), these reforms were instrumental in financing the higher investment rates required to accelerate GNP growth.[5]

Simultaneously, policymakers came to accept firmly the view that rapid economic development depended upon export-oriented industrialization. They argued that Korea's natural resource base was very poor, and that further opportunities for import substitution were to be found only in intermediate and durable goods, for which the limited domestic market could not justify establishing plants large enough to realize technological economies of scale.

An important policy change was the establishment of a uniform exchange rate in 1964, when the won was devalued to 255 to the U.S. dollar. Like its predecessor of 1961, the devaluation of 1964 was designed primarily to simplify the exchange regime and to offset domestic inflation, rather than to increase export incentives. Since 1964, the exchange rate has been devalued at discrete intervals, and there has been continued intervention by the Bank of Korea to maintain a relatively stable nominal rate between devaluation episodes.

Simultaneously, the preferential treatment of exports was extended further. Starting in 1965, the full set of export incentives was extended to producers of indirect exports, that is, intermediate goods used in the production of exports. The purpose of this extension was to offset the bias in favor of imported raw materials that had arisen because these materials were duty free to exporters. In the following year, tariff exemptions were granted on imports of machinery and equipment used to produce both direct and indirect exports, and allowances for accelerated depreciation were granted in the calculation of business expenses for income tax purposes. In addition, existing incentive schemes were strengthened, and a variety of new incentives introduced. Preferential rates to exporters remained unchanged when the nonpreferential commercial bank lending rate was raised in 1965 from 16 to 26 percent. The preferential rate on working capital loans to exporters fell gradually, from 14 percent a year in 1960 to 6 percent in 1967, and the amount that exporters could borrow—proportional to the gross foreign exchange they earned—was progressively increased as the exchange rate became increasingly overvalued in the late 1960s. A series of arrangements gave exporters preferential access to foreign exchange loans.

Exporters received generous wastage allowances on imported inputs for export production, as discussed in the next section. And, starting in 1967, they paid reduced prices for overhead inputs, including electricity

and rail transport. Of lesser importance was the establishment in 1966 of a limited export-import-link system, designed to increase exports with low profit margins and to develop new export markets. The system gave the exporter the temporary right to import certain restricted popular items duty free. Also of negligible overall importance was the granting of monopoly rights to certain exporters in new export markets or in the export of new commodities.

Various nonprice institutional incentives were also introduced during the 1960s. Export performance was established in 1962 as the criterion for granting import licenses; these were given only to traders and firms that had exported beyond a stated limit in the previous year. This limit was increased annually, and by 1970 had reached US$300,000 (in current U.S. dollars). The government-subsidized Korea Trade Promotion Corporation (KOTRA) was founded in 1964 to promote Korea's exports and do market research. The government also sent special trade missions to other countries and authorized the Korean Traders' Association to collect 1 percent of the value of total c.i.f. imports for use as an export promotion fund. A system of export targets for individual firms in particular markets (broken down by product and destination) was introduced in 1962 and quickly became an important means of publicizing the government's export promotion efforts and monitoring progress, the latter as a basis for adjusting export incentives to changing circumstances.

As for incentives to production for domestic sale since the mid-1960s, a few import-substituting industries have benefited from promotional activities such as project identification and feasibility studies under the aegis of successive five-year plans.[6] Some of these industries have been granted price incentives, including tariff exemptions on imported raw materials and capital goods, access to preferential credit, and reduced direct tax rates plus allowances for accelerated depreciation. But in most sectors the only price incentive to domestic sales has been the protection potentially afforded by tariffs and controls on imports.[7]

Trade controls were gradually relaxed after the 1964 devaluation as the number of items eligible for unrestricted import increased. The system was further liberalized in 1967 when the so-called positive list system, under which only those commodities listed in the trade program could be imported, was replaced by the negative list system, under which all commodities not listed were automatically approved for import.[8]

The tariff structure that had been created in 1949 remained essentially unchanged until 1967, except for a minor revision in 1957 to protect domestic industries that had recently emerged. The tariff reform undertaken late in 1967 ultimately led to very few changes. Tariffs were in general raised somewhat, although the highest rate was reduced to 150 percent. The new law also allowed for much greater administrative flexibility, permitting the original legislated rates to be changed by as much as 50 percent by simple administrative decree. The rapid growth of imports that were exempt from customs duties left the average tariff on total imports practically unchanged.

The net result of the policy changes described above was the establishment of an incentive system that generally favored exports over import substitution. Before tracing the impact of these changes by examining time-series estimates of real effective exchange rates, it is well to review the principal export incentives existing in 1967–68 and to clarify which of them may be considered true subsidies.

Export Incentives in 1967–68

By 1967 exporters were exempt from import quotas, tariffs, and indirect taxes on intermediate and capital goods, whether imported or purchased domestically, and they paid no indirect taxes on their export sales. Together these measures provided almost a free-trade regime for exports. In addition, exporters received generous wastage allowances for duty-free and indirect tax-free imports of raw materials, which pemitted some of these imports to be used in production for the domestic market. Certain exporters paid reduced prices for several overhead inputs including electricity and railroad transport, as partial compensation for the payment of indirect taxes included in the normal charges for these inputs. Exporters were the prime beneficiaries of direct tax preferences and subsidized credit. They received a 50 percent reduction in direct taxes on income earned in exporting, along with allowances for accelerated depreciation, and immediate access to subsidized short- and medium-term credit to finance working capital and fixed investment respectively. The export-import-link system entitled selected exporters to import certain popular items that were not otherwise approved for import. As already noted, this system was used to subsidize exports during the late 1950s and much of the 1960s. It has since been used only intermittently on a more or less ad hoc basis to offset exporters' temporary losses related to market fluctuations or entry into new markets.

While exemptions from indirect taxes and tariffs do not add to exporters' revenues, they reduce the production costs of exports below those of products for the domestic market. Thus, an increase in the indirect tax or tariff rates paid to produce a given product for domestic sale makes it more attractive to use existing capacity to produce for export, even though the profit rate earned on export sales has not increased. In this sense, combining

Table 8.2. *Korea: Composition of Export Incentives, 1968*

Form of Incentive a/	Value of Incentive as Percentage of Total Merchandise Exports
Tariff Exemptions	14.4
Indirect Tax Exemptions	7.0
Wastage Allowance b/	2.4
Overhead Rate Reductions	0.4
Direct Tax Reductions	1.1
Interest Subsidies	4.5
Total	29.8

Note: Korea derived a substantial amount of foreign exchange by "exporting" nontradeables through U.S. military procurement. In addition, there were some service exports. With the single exception of tourism (a very small sector in 1968), no preferences were given to producers of nontradeables for "export."

a/ Because information concerning the export-import-link subsidy was closely held, we were unable to obtain estimates of it, though it is known to have been small in 1968.

b/ The wastage allowance subsidy on each imported intermediate input has been estimated by taking the "excess" wastage rate times the difference between the domestic price of the import (inclusive of nominal protection) and the domestic currency equivalent at the market exchange rate of its c.i.f. import price (exclusive of tariff). "Excess" wastage rates were estimated on the basis of an informal survey by the authors and then checked against other estimates.

Source: Larry E. Westphal and Kwang Suk Kim, "Industrial Policy and Development in Korea," World Bank Staff Working Paper, no. 263 (Washington, D.C., 1977), p. 3-39.

indirect tax and tariff exemptions with genuine export subsidies yields an index of the incentive to exporting as against selling domestically, though not of export incentives compared with the free-trade situation. Two effective exchange rates for exports should thus be distinguished: a "gross" rate, which includes indirect tax and tariff exemptions per dollar of exports; and a "net" rate, which does not include them. In turn, since the profits from exporting will be affected if such exemptions are granted or withdrawn over time, the gross rate is the only meaningful measure of incentives when there are changes in the scope of exemptions.

For lack of consistent time-series data, our estimates of effective exchange rates do not incorporate the subsidies under the export-import-link system in operation after 1964, as distinct from premiums earned on export receipts under the multiple exchange system; nor do they include the excess of wastage allowances over actual wastage in production for export, or price reductions on overhead inputs. Very little is known about the precise magnitude over time of the subsidies under the export-import-link system.

More is known about the subsidy related to wastage allowances. This is estimated to have equaled 2.4 percent of the total value of merchandise exports in 1968, as Table 8.2 shows, and to have fluctuated over time, generally rising and falling in relative value with the degree of the overvaluation of the won. Under the wastage allowance system, exporters were granted the automatic right to duty-free imports of intermediate products up to stated limits.[9] The limits administratively established for each input were based on technical input-

Table 8.3 *Korea: Effective Exchange Rate for Exports and Imports, 1958–75*
(annual average; won per U.S. dollar)

Year	Official Exchange Rate (nominal)	Component of the Effective Exchange Rate as Percentage of the Official Exchange Rate: For Exports: Exchange Premiums plus Direct Cash Subsidies	For Exports: Direct Tax plus Interest Subsidies	For Exports: Indirect Tax and Tariff Exemptions	For Imports: Actual Tariffs and Tariff Equivalents	Real Effective Exchange Rates a/: For Exports: Including Only Revenue Incentives	For Exports: Excluding Indirect Tax and Tariff Exemptions (net)	For Exports: Including Indirect Tax and Tariff Exemptions (gross)	For Imports
1958	50.0	128.0	2.4	0.0	28.8	276.7	279.6	279.6	156.5
1959	50.0	169.4	2.6	n.a.	65.6	321.8	324.9	n.a.	197.9
1960	62.5	134.2	2.0	n.a.	60.3	317.5	320.1	n.a.	217.4
1961	127.5	17.3	0.8	n.a.	15.3	287.4	289.3	n.a.	282.2
1962	130.0	7.9	1.1	7.6	12.6	244.7	247.1	264.2	255.5
1963	130.0	33.8	2.8	9.1	13.9	253.5	258.8	276.1	215.9
1964	214.3	19.9	3.2	8.2	15.3	278.7	286.1	305.3	268.0
1965	265.4	0.0	3.7	11.1	10.4	265.4	275.3	304.6	293.1
1966	271.3	0.0	4.6	14.4	9.3	256.4	268.2	305.1	280.4
1967	270.7	0.0	7.4	15.7	9.4	242.8	260.7	298.8	265.4
1968	276.6	0.0	6.6	21.5	9.4	233.2	248.5	298.7	255.0
1969	288.2	0.0	5.1	22.7	8.5	234.3	249.3	299.4	254.5
1970	310.7	0.0	6.7	21.7	8.3	239.9	255.9	307.9	260.0
1971	347.7	0.0	6.5	23.1	6.3	253.5	270.1	328.6	269.7
1972	391.8	0.0	3.2	23.7	6.0	275.0	283.8	348.9	290.2
1973	398.3	0.0	2.2	21.5	4.9	320.6	327.6	396.5	332.5
1974	407.0	0.0	2.1	19.1	4.5	279.2	285.1	338.4	288.1
1975	485.0	0.0	2.7	14.0	5.1	275.0	282.3	320.9	286.6

n.a. Not available.
a/ 1965 prices, adjusted for differences in purchasing power as explained in the text.
Source: Westphal and Kim, "Industrial Policy and Development in Korea," Tables B.1 and B.2.

output relationships and included an allowance for wastage of the input. This wastage allowance exceeded normal wastage through loss, damage, and other causes; that portion of the allowance not used up in export production could legally be used domestically, often at a high profit since these imports were of commodities subject to quantitative controls or high duties. We estimate, for example, that the implicit subsidy on a dollar's worth of imported woolen and worsted yarn was US$0.12; for imported roundwood used to produce plywood, it was US$0.17.

The value of overhead price reductions has always been quite small in relative terms; it equaled only 0.4 percent of exports in 1968. Although relatively unimportant overall, these reductions were of some consequence to the benefiting industries. For example, exported minerals received a 30 percent discount on railway freight charges, and an equal discount on electricity charges was granted to exporters for whom power costs were a large share of total manufacturing costs.

Effective Exchange Rates for Exports and Imports

Table 8.3 shows the total value per dollar of exports of those incentives for which consistent time-series information is available. For convenience, the value of incentives is shown as a percentage of the official exchange rate. The total subsidy provided by the 50 percent reduction in direct taxes has been calculated as the difference between tax liabilities in the absence of any such preference and actual direct tax payments. Because its size depends on the profit rate per dollar of exports, it may fluctuate with profits even if the tax rate does not change.

In turn, the total interest subsidy has been computed as the difference between the interest that would have been paid on outstanding credit of various types, including both short- and medium-term loans, at the nonpreferential commercial bank lending rate and the interest actually paid. The resulting estimate understates credit subsidies because it does not reflect the fact that exporters benefited from immediate access to credit within very generous limits, while for all other borrowers credit from financial institutions in the formal sector has been rationed, more or less stringently, depending on the period. Moreover, the nonpreferential commercial bank lending rate is not an equilibrium rate. Nor is it a robust proxy for the average rate on the outstanding debt of all producers, because those frustrated by credit rationing have generally had recourse to an active informal money market in which real interest rates have been as high as 40 to 50 percent a year.

Because of the way in which the interest subsidy is measured, a change in its value per dollar of exports does not necessarily imply a change in the cost of borrowed capital to exporters. It may reflect simply a change in the nonpreferential commercial bank lending rate. At the same time, as noted above, the direct tax subsidy per dollar of exports may vary even if the preferential tax rate on exports remains constant. Thus the net effective exchange rate, which takes account of exchange premiums and direct cash subsidies as well as direct tax plus interest subsidies, is an imperfect index of the effect of export incentives on the profitability of exporting, because the latter component of the subsidy rate may fluctuate even though there has been no change in either the interest rates paid by exporters or the direct tax rate on income earned from exporting.

Only real effective exchange rates are shown in Table 8.3. These have been obtained from the corresponding nominal rates in the following manner: On the assumption that the prices of a country's exports run parallel with foreign prices, multiplying a nominal effective exchange rate by an index of prices in overseas markets yields the number of won in current prices received per dollar of exports, the latter in constant prices. Then, deflating the figure so obtained by an index of domestic prices gives the number of won in constant prices received per constant dollar of exports—that is, a real effective exchange rate for exports that is adjusted for differences in purchasing power. Table 8.3 allows the gross and net rates to be compared with the rate including only those incentives that directly affect revenues, that is, exchange premiums and direct cash subsidies.

Exporters first obtained exemptions from tariffs on imported intermediate inputs in 1959, from indirect taxes in 1962, and from tariffs on imported capital goods in 1966. Thus, to appraise trends in export incentives before 1966, as well as to compare incentives before 1966 with those after 1966, we must examine the gross real effective exchange rate for exports, because its values reflect the granting of exemptions. The net rate is the superior index for examining trends after 1965, since there were no subsequent major changes in the scope of exemptions.[10] (Thus, after 1965, variations in the relative value of exemptions, which affect the gross but not the net rate, reflect only changes in tariff and indirect tax rates from which exports were already exempted, including the effect of shifts in the composition of exports.)

For various reasons, the rise in the overall inducement to export resulting from the incentive policies adopted during the first half of the 1960s was certainly greater than is indicated by the comparison of the gross real effective exchange rates for exports in Table 8.3. First, the gross real effective exchange rate for exports fluctuated more widely before 1965 than in the following five years. Thus, its average value in 1962 and 1963, before the devaluation upon the return to a unified exchange

rate, was only 270.1. Second, our estimates neglect two incentive mechanisms that became important in the mid-1960s, namely, wastage allowances and the export-import-link system, although the latter was unimportant after about 1967. Third, our estimates fail to indicate adequately the increase in credit subsidies arising from the relaxation of credit ceilings for exporters that took place in the early and mid-1960s.

Most important, the comparison of effective exchange rates for exports neglects the simultaneous reduction in incentives given to import-competing production, as well as the gradual relaxation of import controls after 1964. Table 8.3 also gives estimates of the real effective exchange rate for imports, which includes average customs duties and tariff equivalents (for example, premiums paid to purchase foreign exchange certificates from exporters) paid per dollar of imports.[11] Unfortunately, however, the effective exchange rate for imports is a virtually meaningless indicator of protection from imports because it does not reflect the effect of import controls. Apart from estimates for 1968, which are discussed in the next section, there is no solid evidence on the effects of import controls.

Because of the sale of exporters' foreign exchange receipts in a free market, and then the devaluation in 1961, export incentives were by no means lacking in the late 1950s and early 1960s. It will be recalled that exports began growing at a modestly rapid pace in 1957, and although the growth up to about 1960 may be interpreted simply as a return to the situation prevailing before the Korean War, it is notable that incentives were not lacking. Exports increased more rapidly between 1960 and 1965, at a compound annual rate of 24 percent in real terms (see Table 8.1). Then, owing to the increase in export incentives and particularly their stability, the real growth of exports further accelerated in the five years after 1965, reaching 37 percent a year.

In relation to its average over the preceding five or six years, the net real effective exchange rate for exports increased almost 30 percent between 1970 and 1973, principally as a result of the appreciation of the Japanese yen, and contributed to the 250 percent increase in the real value of exports during this period. In response to these and other less transitory suggestions that export incentives were yielding excessive profits, the government began to abolish incentive mechanisms in 1973. Most important, the benefits of lower direct tax rates and automatic tariff exemptions on imported capital goods were withdrawn, while wastage allowances declined, as did interest subsidies.[12] Nonetheless, in 1974 and 1975 the net real effective exchange rate remained higher than its average over the latter half of the 1960s. Less because of the change in incentives than because of the world recession, the real value of exports increased by only 3 percent in 1974. Real export growth rose to 23 percent in 1975 and regained its rapid pace in 1976, when exports in constant dollars increased by 36 percent.

The real effective exchange rates for exports shown in Table 8.3 are, of course, only crude indicators. They would be more precise indicators of profitability if the nominal exchange rate could be multiplied by an index of export unit values or export prices abroad, rather than by an index of the general price level abroad. Ideally, the overall domestic wholesale price index should be replaced by an index of wholesale prices weighted by export volumes (to gauge the profitability of exports relative to domestic sales) or by an index of export production costs. The estimates would indicate the competitiveness of Korea's exports more precisely if indexes of domestic and foreign production costs were used in place of price indexes. Balassa's refinements of the estimates by means of production cost indexes confirm that Korea's exports were slightly more competitive in 1974 and 1975 than in the late 1960s, and that they were extremely competitive between 1971 and 1973.[13]

To conclude, the changes in export policies that accompanied the adoption of an export-led industrialization strategy clearly increased the incentive to export. Furthermore, the new measures led to the gradual replacement of a complicated, largely ad hoc system of incentives based on multiple exchange rates (including the linking of certain imports to exports) and on direct cash subsidies, requiring frequent adjustments, with a simpler and more stable system. Nonetheless, there has been a need for periodic devaluations and changes in export incentive rates (principally wastage allowances and credit preferences) between devaluations in order to keep the real effective exchange rate for exports relatively constant in the face of more rapid inflation domestically than abroad.[14]

Estimates of Nominal Protection, 1968

To assess Korea's incentive policies adequately, it is necessary to quantify their combined effects. Since the mass of data required has been assembled only for 1968, this and the next section focus on incentive measures in that single year. The measurement of nominal protection is the first step toward measuring effective incentive rates.

The System of Nominal Protection

Legislatively established tariff rates are only a part of Korea's tariff system. There are also several programs under which tariff rates are set administratively, by far the most important of which in 1968 was the special

tariff system. Although this system came into prominence in the mid-1960s, it was first used in 1961 and then again in 1964 to smooth the transition to the unitary fixed exchange rate.[15] Special tariffs augmented the so-called regular tariffs. While regular tariff rates were set legislatively on an ad valorem basis, special tariffs were set administratively at fixed intervals to absorb the scarcity premium on those commodities sold domestically at prices appreciably above the domestic currency equivalent of the c.i.f. import price plus the regular tariff and indirect taxes. Special tariff rates varied over time as scarcity margins changed and were established on the basis of comparisons between domestic and world prices.[16] In the remainder of this study all administrative levies together are referred to as the *special* tariff. The compound tariff rate made up of the regular plus the special tariff rates is called the *legal* tariff rate.

Beside the exemptions from customs duties granted for export-related activity, reduced tariff rates have applied for several strategic import-substituting sectors identified (usually in the five-year plan documents) and approved by the government. Tariffs have not been levied on capital goods imported by enterprises with foreign equity financing, nor on imports of capital goods financed by foreign loans when specific petitions for exemptions are granted. Exemptions (including partial reductions) were widespread throughout the 1960s and caused the government substantial losses in revenue. The value of exemptions gradually rose in proportion to potential customs duties, and from 1966 onward it exceeded that of collections. Thus, the average actual tariff rate on all imports—that is, tariff collections divided by the won value of imports—has fallen steadily since the mid-1960s.

In 1968 tariff exemptions amounted to W66,400 million, whereas tariff collections were only W37,800 million. Tariff exemptions on intermediate inputs into (direct and indirect) exports accounted for 29 percent, and those on machinery and transport equipment for 51 percent, of all exemptions.[17] Of the remainder, 8.7 percent was due to duty-free imports of rice and barley, and the rest to imports of intermediate goods to be used in production for sale on the domestic market, imports of popular items linked to exports, and imports under other miscellaneous duty-exempt activities. The average actual tariff rate in that year was 9.4 percent; by 1975 it had fallen to 5.1 percent.

All imports of certain commodities have been exempt from customs duties; for them the legal tariff is irrelevant. This is true for rice and wheat, for example, with legal tariff rates of 25 and 10 percent, respectively; among manufactured goods, cotton yarn and petroleum products were also imported wholly duty free.

Furthermore, the government's policy of selectively granting partial or complete tariff exemptions to privileged importers has created segmented markets: a protected market in which domestic output competes with imports subject to the full or partial tariff, and an unprotected market in which domestic output competes with duty-exempt imports. Thus, in the markets for intermediate goods required both by exporters and by nonexporters, the former purchase their inputs in the unprotected market, while the latter purchase in the protected market. Among the intermediate goods in this category that are domestically produced as well as imported, there is often but one producer or the competition among a few producers is imperfect, so that differential or discriminatory pricing can arise between the two segments of the market. At the same time, exporters can sell some of their duty-free imports in the protected market, since wastage allowance regulations permit them to undertake duty-free purchases in excess of their needs. In several cases these sales are sufficiently large to affect the price in the protected market and to drive nominal protection for noncompetitive imports below the legal tariff.

There are two additional reasons that Korea's legal tariff rates are inadequate measures of nominal protection in a number of instances. First, for more than half of domestic output, quantitative restrictions on imports had the potential effect of raising nominal protection above the legal tariff rate. Second, tariffs on some commodities were prohibitive in the sense that imports were nil or negligible; in these cases the legal tariff rate indicates potential rather than realized protection. By and large, prohibitive tariffs may be said to apply to the commodities classified as non-import-competing (imports accounting for less than 10 percent of domestic supply); these commodities accounted for seven tenths of domestic sales of domestic production in 1968.

Design and Scope of the Price Comparison Survey

Because legal tariffs so often fail to be an adequate index of nominal protection in the protected segment of the market, we commissioned a survey of domestic and world prices for comparable products.[18] After various adjustments, this survey served as the basis for estimating price differences between domestic and foreign markets.

Product groups included in the survey were chosen from 150 goods-producing sectors for which effective incentive estimates were to be calculated (see the section "Estimates of Effective Incentives, 1968" below). The input-output table used to calculate effective incentive rates contains data provided by the Bank of Korea on outputs, exports, and imports for 2,000 product groups. These data were used to select several product groups

within each of the 150 sectors, the principal criterion being the share of the product group in sectoral output.[19] The selection also emphasized non-import-competing product groups, products subject to quantitative import restrictions, and export products. Price observations were ultimately secured for 365 product groups , which account for 70.8 percent of domestic sales and 78.2 percent of exports.[20]

Engineers and industry specialists familiar with each product group were employed to select the individual commodities for which price comparisons were to be made. The selection was based on the importance of the individual commodities in the output of the group. For the majority of product groups, single price comparisons were obtained, but for a number of groups comparative price information was available for several products. In the latter instance, observations were aggregated to the product group level by means of weights based on the judgment of the experts as to the relative importance of the specific commodities within the group's domestic production. Price comparisons were made for 823 products.

The major sources of domestic price information were individual producers, producers' associations such as the Korean Chamber of Commerce or the Korea Cannery Association, and government agencies including the Ministry of Finance, the Economic Planning Board, the Bank of Korea, and the Korea Development Bank. Export prices for products actually exported and import prices for those actually imported were obtained from domestic records of the trade transactions. For products not actually imported in 1968, import prices were estimated from wholesale prices in Japan and, less frequently, in the United States, or from Korean export prices.

Price comparisons are stated in terms of the "implicit tariff," which is equal to the percentage excess of the actual domestic price over the domestic currency equivalent of the world price at the official exchange rate in 1968.[21] A complete set of the comparative price data aggregated to the product group level has been compiled by Westphal and Kim,[22] who also provide information on tariffs, the type of import and control, and data for the sampled product groups on imports, exports, and domestic production in world prices.

Estimation of Nominal Protection Rates

Rules had to be established to interpret the results of the price comparison survey. For a significant number of products, including some of Korea's major textile exports, the import price substantially exceeded the export price. Export prices may have been set below average production costs and thus may not represent world prices at which sustained supplies would be forthcoming to the domestic market. We thus inferred that a more accurate estimate of the price differential on protected domestic sales is the implicit tariff derived from the import price, which is hereafter referred to simply as the *implicit tariff*.

Next, a set of rules was drawn up for selecting nominal rates of protection. For export sales (except of ginseng) as well as for sales of domestically produced inputs used in export production, the nominal rate of protection was taken to be nil. Table 8.4 indicates the rate selected for domestic sales in protected markets in several cases as well as the frequency of the various cases among the total sample of product groups. The cases are distinguished by: the relation between the implicit tariff and the legal and actual tariff rates;[23] the trade category, as defined in Chapter 1 above; and, if relevant, the type of import control imposed.

Table 8.5 gives the pertinent information for product groups selected to illustrate the following discussion of how the survey results were translated into estimates of nominal protection. The import-competing commodity groups included in Table 8.5 had the largest share of production in the five sectors with the highest domestic sales among import-competing sectors. The non-import-competing groups shown in the table were chosen on the basis of their importance either in total exports (fresh fish, cement, and diesel oil) or in total domestic sales. The export and export-and-import-competing commodity groups included in the table represent the sectors with the largest weight in total merchandise exports in 1968.[24]

In fewer than 20 percent of the observations the implicit tariff was higher than the legal tariff. If imports were also restricted, as they were for transformers, wheat, and steel sheet, the implicit tariff was used to estimate nominal protection.[25] If imports were not restricted and exceeded one tenth of domestic supply, the nominal rate of protection was set equal to the legal tariff rate, since this result would be expected under competition.

The implicit tariff was identical to the legal tariff in only three product groups. When the implicit tariff was less than the legal tariff, so that there was tariff redundancy, the presence or absence of quantitative restrictions on imports was irrelevant except in the case of a few commodities produced by monopolistic or publicly controlled industries.

In the case of import-competing commodities for which the excess of domestic over foreign prices is less than the legal tariff, the legal tariff will be the appropriate measure of nominal protection if it is levied on all imports and if there is perfect competition and approximate uniformity among all buyers. The difference be-

Table 8.4. *Korea: Frequency Distribution of Nominal Protection Rates on Product Groups, by Trade Category, 1968*

Relation of Implicit to Legal Tariff; Estimate Selected	Trade Category a/ X	NIC	IC	XIC	Total
Implicit Exceeds Legal Tariff					
Imports Restricted					
Implicit Tariff	2	28	11	2	43
Legal Tariff	1	1	0	0	2
Imports Unrestricted					
Legal Tariff	2	11	5	0	18
Implicit Equals Legal Tariff	0	3	0	0	3
Implicit Less than Legal Tariff					
Implicit Tariff	18	85	17	4	124
Legal Tariff	0	0	2	0	2
Actual Tariff	1	4	2	1	8
Implicit Tariff Less than Zero					
Zero	19	92	8	5	124
Implicit Tariff	4	1	1	1	7
Legal Tariff	0	0	3	0	3
Actual Tariff	1	19	9	2	31
Total Observations	48	244	58	15	365

Note: The implicit tariff equals the ratio of the domestic, exfactory, producer price to the c.i.f. world price in domestic currency equivalent at the 1968 legal exchange rate, minus one and multiplied by 100. The actual tariff rate was applied only in the case of machinery and equals tariff collections divided by the c.i.f. value of imports in domestic currency equivalent.

a/ The four categories are export (X), non-import-competing (NIC), import-competing (IC), and export-and-import-competing (XIC).

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Annex Table 1.

tween the legal and implicit tariffs then measures the extent of quality variation, product differentiation, or the brand preferences of consumers. Even if the legal tariff is levied on a high proportion of imports, however, it is the appropriate measure of protection only under the assumption that imports are close substitutes for domestically produced items in the same category. Correspondingly, nominal rates of protection on these groups of products have been chosen on the basis of their particular circumstances.

Table 8.5. *Korea: Nominal Rate of Protection on Selected Products, by Trade Category, 1968*
(percent)

Trade Category	Industry Group (1)	Tariff Legal (2)	Tariff Actual (3)	Price Comparison Exp (4)	Price Comparison Imp (5)	Nominal Protection (6)	Import Control (7)	Trade Share Imp (8)	Trade Share Exp (9)	Share in 1966 Exp (10)	Share in 1966 D.S. (11)	Derived Weight in 1968 (12)	Sector Export Share (13)
Export Industries													
pe > pd													
8. Ginseng	I	25	0	-35.4	-35.4	-35.4	R	0.1	39.1	0.80	0.09	0.03	1.75
18. Dried Seaweed (Laver)	II	25	2	-66.4	-66.4	-66.4	R	0.0	40.7	3.54	0.38	0.59	3.03
19. Dried Fish a/	II	35	0	-20.4	-20.4	0.0	R	0.0	50.1	1.19	0.09	0.11	2.79
54. Veneer Sheet (Plywood)	VIA	50	5	n.a.	-31.2	0.0	AA	0.7	73.8	12.15	0.32	0.39	13.63
116. Wigs (XIC in 1966)	VII	70	0	-42.7	-42.7	0.0	AA	0.0	100.0	3.09	0.00	0.00	5.72
pe = pd													
19. Frozen Seafoods a/	II	35	29	-4.9	-4.9	0.0	R	0.0	24.5	1.36	0.31	0.26	2.79
31. Hematite Iron Ore	IV	0	0	-2.6	-2.6	0.0	AA	0.0	85.0	3.88	0.05	0.05	2.07
32. Tungsten	IV	0	0	n.a.	n.a.	0.0	AA	1.7	58.5	0.25	0.01	0.00	1.35
48. Silk Yarn	VIA	60	0	-2.9	-2.9	0.0	AA	0.0	77.2	4.59	0.10	0.07	4.18
69. Rayon Fabrics	VIB	100	0	7.0	3.3	3.3	R	0.0	27.1	1.85	0.37	0.26	1.05
pe < pd													
65. Cotton Sheeting a/	VIB	100	0	23.0	2.2	2.2	PR	9.8	19.5	2.24	0.69	0.86	2.53
65. Cotton Shirting a/	VIB	100	0	103.7	103.7	103.7	PR	0.0	32.5	0.73	0.11	0.17	2.53
67. Woolen Fabrics	VIB	100	16	186.0	69.4	69.4	R	0.0	10.2	0.32	0.21	0.24	0.95
98. Knit Underwear	VII	150	42	11.5	11.5	11.5	PR	0.2	38.4	3.35	0.40	0.55	11.18
99. Men's Suits	VII	155	4	76.0	-10.2	0.0	PR	0.1	11.1	1.82	1.09	2.32	13.03
Export-&-Import-Competing Industries													
70. Nylon Fabrics (X in 1966)	VIB	100	0	130.5	28.0	28.0	R	0.0	15.0	0.75	0.31	0.29	3.25
102. Cotton Napkins (X in 1966) b/	VII	100	14	-6.7	-6.7	0.0	PR	1.9	42.5	1.32	0.13	0.12	1.77
122. Stainless Forks	VIII	100	5	-0.6	-0.6	0.0	R	82.5	48.9	0.20	0.01	0.03	0.44
123. Radios	VIII	100	2	n.a.	74.2	74.2	R	46.0	61.6	1.30	0.06	0.18	0.97
141. Transformers (NIC in 1966)	IX	70	1	n.a.	90.9	90.9	R	0.0	0.0	0.00	0.05	0.15	0.91
Import-Competing Industries													
2. Wheat	I	10	0	n.a.	38.7	38.7	R	68.1	0.0	0.00	0.55	0.55	0.08
25. Mixed Fodder	II	21	2	6.2	0.9	0.9	R	10.6	4.9	0.09	0.13	0.25	0.14
74. Newsprint	VIB	30	5	n.a.	9.0	9.0	AA	14.7	1.1	0.05	0.33	0.41	0.02
87. Steel Sheet	VIB	35	8	n.a.	81.3	81.3	R	78.1	0.0	0.00	0.12	0.18	0.29
149. Automobile Sedan	X	151	30	n.a.	99.8	99.8	R	37.1	0.1	0.00	0.16	0.76	0.27
Non-Import-Competing Industries													
1. Polished Rice	I	25	0	n.a.	14.2	14.2	R	0.6	1.3	2.79	15.52	12.90	0.00
13. Fresh Fish (X in 1966)	I	35	1	-11.5	-11.5	0.0	R	0.0	18.4	3.97	1.31	3.03	2.14
30. Anthracite Coal	IV	10	10	25.7	25.7	10.0	AA	0.0	2.9	0.61	1.51	1.45	0.37
44. Portland Cement c/	V	15	11	27.0	3.1	3.1	AA	10.2	11.8	1.52	0.85	1.18	1.15
57. Diesel Oil (X in 1966)	VIA	50	0	n.a.	-25.1	-25.1	AA	4.7	10.4	1.19	0.76	1.16	1.51
Total Shares										54.95	26.02	28.54	76.57

(Table continues on the following page.)

Table 8.5 (continued)

n.a. Not available.

Note: Commodity groups are classified according to the 1968 trade category of the sector in which they fall, not by the commodity group's classification in 1966. The former is the relevant classification to ascertain an observation's effect on the aggregate results for 1968. Data for 1966 were employed at the commodity group level because such detailed data were not available for 1968. All figures are percentages rather than proportions. The number to the left of each commodity group's name is its sector index at the 150-sector level. pd = domestic, exfactory, producer price; pe = f.o.b. export price in domestic currency equivalent.

Column (1): As in the companion case studies; see the section "Estimates of Effective Incentives, 1968" and Table 8.7 for the definition of industry groups.

Column (2): The total legal tariff is equal to [(1+tr)(1+ts)-1] x 100, where tr is the regular tariff rate and ts is the special tariff rate (both rates expressed as proportions).

Column (3): The actual tariff rate is equal to tariff collections divided by the 1968 c.i.f. value of imports. A zero may indicate that there were no imports of the item in 1968. (See the source for further details.)

Columns (4) & (5): Price comparisons between domestic and world prices are expressed in terms of the implied nominal rate of protection. Entries for the Exp (export) price comparison are [(pd/pe) - 1] x 100 where pd is the domestic, exfactory, producer price and pe is the c.i.f. export price. Entries for the Imp (import) price comparison are [(pd/pm) - 1] x 100 where pd is as before and pm is the c.i.f. import price.

Column (6): Authors' estimate of the rate of nominal protection to protected domestic sales. See the text for the basis of estimation.

Column (7): The symbolic entries under this column are defined as follows: PR, imports prohibited; R, imports restricted; and AA, imports automatically approved.

Column (8): The share of imports in total domestic supply (domestic production less exports plus imports) in 1966, using world market price values.

Column (9): The share of exports in total domestic production in 1966, using world market price values.

Column (10): Exports of the commodity group as a share of total commodity exports in 1966, using world market price values.

Column (11): Domestic sales (i.e., of domestic production) of the commodity group as a share of total commodity domestic sales in 1966, using world market price values.

Column (12): Weight of the commodity group's nominal protection rate in the weighted average nominal protection rate over total commodity domestic sales for 1968. Equal to: (Sector's share in total commodity domestic sales in 1968) times (Commodity group's share in 1966 in the total domestic sales of commodity groups within the sector for which price comparisons were made), using world market price values. Note that the last term in this expression is equal to the commodity group's weight given in the source.

Column (13): Sector's exports as a share of total commodity exports in 1968, using world market price values.

a/ Another commodity within this sector appears elsewhere in the table.
b/ The only price comparison available for sector 102, Other Textile Products.
c/ Misclassified as an export good elsewhere in the presentation of the results; was an XIC good in 1966.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Annex Table 1.

Active carbon is a case in which the legal tariff appears relevant. The legal tariff rate was 136 percent, the actual rate 90 percent, and the implicit tariff 8 percent. Imports were 53 percent of domestic supply, and there is good reason to suspect quality differences between the imported and domestically produced items for which comparative prices were secured.

Whether the implicit tariff is positive or negative is of major interest. The implicit tariff has been chosen as the most appropriate measure of nominal protection for most imported commodities whose domestic prices exceeded foreign prices by a positive margin that was less than the legal rate of tariff. For several commodities, including newsprint, mixed fodder, and cement, which appear in Table 8.5, this choice has been made because widespread tariff reductions were granted to importers. The actual tariff on newsprint, for example, was much lower than the legal tariff, since almost all major users of newsprint were automatically exempted from the tariff. In this as in similar cases, the implicit tariff was generally close to the actual tariff and appears to give the appropriate estimate of nominal protection. The same conclusion applies to standardized commodities such as cement that are unlikely to differ in quality whether they are domestic or imported products.

Many products had domestic prices below their world prices, so that their implicit tariffs were negative. With various exceptions, their nominal rates of protection were assumed to be zero, since in the absence of effective market restrictions the negative implicit tariffs could only be ascribed to quality differences between domestic and imported varieties.

Petroleum products (represented in Table 8.5 by diesel oil) are a special case because they are standardized commodities whose quality is unlikely to differ between domestic products and imports. Moreover, all crude petroleum was imported and refined domestically in an oligopolistic and government-controlled industry while export sales were made under U.S. military procurement. Since domestic prices were below (potential) import prices, we assume protection was negative for this group.

In turn, the nominal rate of protection has been equated to the legal tariff on commodities of which a large share of domestic supply was imported and the actual tariff was close to the legal tariff. For example, for asbestos (not shown in Table 8.5), imports constituted 95 percent of the total domestic supply and both the legal and actual tariff rates were 15 percent; these facts cannot be reconciled with a domestic price that is 25 percent below the world price unless the domestic variety is substantially lower in quality than the imported.[26]

In machinery and equipment,[27] there were significant quality differences between the domestic and imported items for which comparative prices were obtained, and it was impossible to estimate the division of domestic machinery sales between the protected and unprotected markets. The domestic prices of many types of machinery were lower than their tariff-inclusive import prices, and much of the machinery produced domestically in a significant volume and over a long period of time had negative implicit tariffs. Thus machinery for metal working and processing had an average legal tariff rate of 19.9 percent and an average implicit tariff rate of −53.3 percent; for textile machinery, including sewing machines, these figures were 33.7 and −38.7 percent, respectively; and for special and general industrial machinery, 41.7 and −22.0 percent.[28] In contrast, prime movers, farm machinery, office machines, and most electrical and transport equipment—items not domestically produced in significant volume much before 1968—had positive implicit tariff rates, often in excess of their legal rates because of quantitative restrictions on competing imports.

An informal and limited survey of some twenty plants, conducted by one of the authors and covering principally textile machinery, machine tools, and electrical equipment, indicated that differences between the total purchase prices of imported and domestically produced machinery were generally offset by quality differences.[29] For this type of product, quality differences can be measured objectively in terms of shorter lifetimes, higher maintenance and operating costs, differences in the quality and sale price of the output produced, and so forth. The survey findings suggest that the appropriate nominal protection estimate would be the legal tariff rate had there not been widespread exemptions and reductions. Lack of independent information on how domestic sales of machinery were divided between the protected and unprotected markets made it necessary to rely on actual tariff rates in some cases.[30] The actual tariff rate reflects the degree to which tariff reductions were granted and serves as an estimate of average nominal protection in both markets together.

To summarize, the rule applied in the case of machinery and equipment is: If the implicit tariff did not exceed the legal tariff, the nominal rate of protection was taken to be the actual tariff rate or the implicit tariff rate, whichever was higher (thus all the nominal rates of protection on these products were nonnegative). If the implicit tariff rate exceeded the legal tariff rate, then the same rules were applied as for other products.

Consider now the price comparisons for exported commodities. World prices for some exported primary products (such as seaweed and dried and fresh fish) exceeded domestic prices by more than transport margins. In most cases markets were competitive, and we have taken the nominal rate of protection on domestic

sales to be zero, under the assumption that the price difference was due to the inferior quality or packaging of the domestically consumed products. Exports of ginseng and dried seaweed (laver) were controlled by the government, and the price difference can be assumed to reflect the nominal rate of protection. A government monopoly buys up the entire ginseng crop at harvest and sells at the same price in the domestic and international markets. There is an implicit export tax on ginseng since the farmer receives less than this price. In contrast, there is no export tax on laver, for which the government acts only as a sales agent. Almost all exports of laver go to Japan, at prices negotiated by the Korean and Japanese governments.

Export price exceeded the domestic price for only a few manufactured products, the principal ones being veneer and wigs. Such differences were ascribed to quality differences, and the nominal rate of protection on domestic sales was taken to be zero. For most manufactured export products, nominal protection rates on domestic sales were set equal to the implicit tariff, since their domestic prices substantially exceeded world prices. This price difference might be explained by differences in the costs of producing for the export and domestic markets; that is, tariffs and indirect taxes were levied on intermediate inputs for domestic sales but not for exports. Whether this explanation suffices is discussed in the next section.

An Overview of the Estimates

The price comparison survey indicates that there was substantial tariff redundancy, the overall average nominal protection rate (on domestic sales) in 1968 being only 14 percent compared with the overall average legal tariff rate of 54 percent.[31] The survey further indicates that nominal protection rates were by and large not closely related to legal tariffs. The average nominal protection rate for primary products (17 percent), for example, exceeded that for manufactured products (12 percent); in striking contrast, the average legal tariff rate on primary products (35 percent) was about half of that on manufactured products (68 percent).

The relatively high protection to primary production can be ascribed to the protection afforded the agricultural sector (most mining activity received no protection at all). Korea is exceptional in this respect, since in almost all developing countries nominal rates of protection on manufactures exceed those on agricultural products. Korea's pattern of protection is also unique among developing countries in that the overall average rate of nominal protection, 14 percent, was relatively low.

In view of these findings, it is tempting to conclude that import controls added little to the protection provided by the tariff structure. To verify this conclusion, it is necessary to analyze the protection of import-restricted commodities separately and to distinguish special from regular tariffs, since the former were in many instances used to capture the scarcity premiums resulting from quantitative restrictions. In 1968 the special tariff was levied on the excess of the implicit tariff (as estimated by the Customs Office) over the sum of the regular tariff *plus* 30 percent, to allow for normal trade and wholesale margins.

Special tariffs were imposed on 123 product groups that accounted for 14 percent of total domestic sales within the sample. The weighted average of special tariff rates on the seven primary commodities subject to such tariffs was 207 percent, while the legal (regular plus special) tariff rate on these commodities was 263 percent. These averages are, however, dominated by red pepper, which is the single most important vegetable in the Korean diet, if judged by total sales volume;[32] when red pepper is excluded, the weighted averages are 80.2 and 81.1 percent, respectively. The regular tariff on red pepper was 19 percent, whereas the special tariff was 217 percent; it is a restricted item imported only when domestic supplies fall short because of a poor harvest. By contrast, the weighted average of special tariff rates on manufactures subject to such tariffs was only 10 percent, compared with a compound legal tariff rate of 84 percent.

In the forty-three cases in which estimated rates of nominal protection exceeded legal tariff rates, the special tariff did not completely eliminate the scarcity premium. Only in eleven product groups, however, did the implicit tariff exceed the legal tariff by substantially more than 30 percent. Among these were wild sesame, gold, two types of fertilizer, three different metal products, duplicating machines, freight cars, and adhesive tape. The excess was largest in the case of tape, being 276 percentage points.

Final judgment on the importance of quantitative restrictions must rest on a comparison of nominal protection with regular tariff rates, that is, those fixed legislatively on an ad valorem basis. In seventy-seven product groups nominal protection exceeded the regular tariff rate, but these groups accounted for only 11 percent of the total domestic sales in our sample. The figures shown in Table 8.6 are weighted averages for these groups, which have been further classified by trade category. Quantitative restrictions did afford additional protection for these product groups, which included barley and wheat, red pepper, chickens, worsted yarn, steel sheet and wire rod, wire and cable, cotton shirting, several chemical products such as synthetic staple fiber, and several metal products including tools. But since the groups accounted for such a small proportion of the

Table 8.6. *Korea: Protection Resulting from Import Controls, by Trade Category, 1968*
(percent)

Trade Category	Number of Commodity Groups	Nominal Protection Rate	Regular Tariff Rate
Export	5	64.9	56.5
Export-&-Import-Competing	4	98.6	38.7
Import-Competing	22	41.5	18.0
Non-Import-Competing	46	66.2	26.9
Total (average)	77	62.6	26.6

Note: Includes only those product groups for which nominal protection exceeded the regular tariff rate.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Annex Table 1.

value of domestic sales, in overall terms it must be concluded that quantitative restrictions were relatively unimportant. This holds even though import controls were ostensibly imposed on competing imports in the markets for commodities representing 76 percent of all domestic sales in the sample.[33]

Estimates of Effective Incentives, 1968

Policies affecting domestic prices were discussed in the preceding section and were given quantitative expression in estimates of nominal protection. In this section we discuss estimates of effective protection and subsidies that quantify the effects of industrial incentives on both gross receipts and input costs by expressing these effects in relation to value added or the returns to primary factors of production.

Our discussion of the effective incentive estimates begins with a brief commentary on data sources and estimation procedure. This is followed by an examination of effective incentive rates on total sales, which measure the average incentives received by individual sectors for their sales in all markets and which indicate the comparative efficiency of different sectors.[34] Since exporters received incentives unlike those confronting producers selling in the domestic market, effective incentives are considered separately for exports and domestic sales. Perhaps most interesting are the results on incentives to domestic sales compared with incentives to export sales. This section concludes with estimates of net effective incentive rates, adjusted for overvaluation of the exchange rate, and a summary of our principal findings.

Data Sources and Method

Our estimates are based on data for 1968 from published and government sources. Data on production inputs were obtained from the Bank of Korea's input-output table of 232 sectors that produce tradeables.[35] These were aggregated into 150 sectors by keeping separate those sectors in which either exports or competing imports in 1968 exceeded US$500,000 and those producing machinery and miscellaneous goods for which output or exports were anticipated to grow rapidly in the near future. The remaining sectors, for which output was relatively small, were aggregated on the basis of their output composition.

It was assumed that the same set of sectoral input coefficients in world prices pertained to all sales regardless of destination.[36] The original input-output coef-

ficients in domestic producer prices are in effect weighted averages of those pertaining to production for each sales destination. Hence, detailed data on the incentives granted to each sector's sales by destination enabled us to estimate input-output coefficients in world prices and to construct separate input-output coefficients in domestic producer prices for each sales destination. We were able to quantify the effects of all incentive policies in force in 1968 except for those of the export-import-link system and advance deposits for imports, neither of which were large in that year. The estimates of nominal protection on protected domestic sales in each of the 150 sectors are weighted averages of the results obtained for the individual product groups discussed earlier. Nominal protection on direct and indirect exports was taken to be zero, except in a few special cases.[37]

Formally, the effective rate of protection is defined as the percentage excess of domestic over world-price value added, where the latter equals the difference between the world price of the product and the cost of its inputs at world prices. Value added is taken to be measured net of depreciation.

Effective subsidy estimates incorporate the effects of direct tax and credit preferences on value added. These incentive mechanisms do not change unit value added in world prices, but they do affect the composition of value added as well as profits after taxes. To incorporate these subsidies, the actual total direct tax liabilities of all firms were reapportioned to each sector on the basis of its share in the total tax base; that is, it was assumed that all firms used uniform depreciation guidelines and were liable for the same average tax rate on their net income under a neutral tax policy.[38] The difference between the reapportioned tax liability and a sector's actual tax liability is the estimated tax subsidy. Interest subsidies were determined in an analogous fashion, by assuming that under a neutral policy all sectors would have paid an identical average interest rate on outstanding loans, that rate being determined as the ratio of total interest payments by all sectors to total loans outstanding.[39] Total direct tax and interest subsidies were then added to each sector's value added in domestic prices.[40] The effective subsidy rate is the percentage by which this adjusted value added exceeds value added at world market prices. Since the sum of all direct tax and credit subsidies over all sectors is zero, the average of all effective subsidy rates (weighted by value added at world market prices) is equal to the weighted average of all effective protection rates.

In analyzing the results, we have used the ten industry groups and four trade categories employed in the companion studies. The 150 sectors are grouped by type of industry in Appendix Table 8.1, which shows disaggregated sector-by-sector estimates of effective incentives. That table also indicates the trade category to which each sector has been assigned on the basis of trade and production data in world prices for 1968.

Tables 8.7 and 8.8 show weighted averages of nominal and effective incentive rates for industry groups and trade categories, respectively, calculated by both the Balassa and Corden methods of treating nontradeable goods. The discussion in the text below relies on the Balassa measures unless otherwise noted. (Information on the magnitude of sales, value added, and input protection is available from the authors.) Nominal protection rates and legal tariffs have been averaged by using sales at world prices as weights, and effective incentive rates have been averaged by using value added at world prices as weights.

Measures of incentives were calculated separately for three distinct markets: the protected domestic market, the unprotected domestic market defined as the market for inputs for exports (indirect exports), and the export market. But since incentives in the unprotected market were almost identical to those for direct export, only the average incentives in both domestic markets are presented under the heading "domestic." Table 8.9 shows simple and rank correlations among the various indicators of incentives.

Average Incentives to Total Sales

Table 8.7 shows that the average legal protection to total sales was 49 percent, compared with average nominal protection of 13 percent.[41] The rank correlation between average legal and nominal protection rates is statistically significant at the 0.01 level, but the coefficient is only 0.45 (Table 8.9). The average nominal protection on intermediate inputs, weighted by the value of intermediate input use in world prices, was 17 percent. Since protection was higher on inputs than on total sales, the average effective protection rate, 10 percent, was less than the average nominal protection rate by roughly 20 percent. Thus, whether measured in nominal or effective terms, protection in Korea was quite low by international standards.

The Spearman rank correlation between average nominal and effective protection rates at the sectoral level is 0.87. But, because of extreme observations, the simple correlation coefficient is only -0.17. Aggregate effective protection and subsidy rates are highly correlated at the sectoral level: The rank and simple correlation coefficients are both greater than 0.95. However, this reflects the close association between effective protection and effective subsidy rates on domestic sales; for reasons noted below, there is virtually no correlation between these rates on export sales.

Table 8.10 shows the frequency distributions of var-

Table 8.7. *Korea: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1968*
(percent)

Industry Group	Nominal Protection: Legal Tariff D	Nominal Protection: Legal Tariff A	Nominal Protection: Nominal D	Nominal Protection: Nominal A	Effective Protection: Balassa E	Effective Protection: Balassa D	Effective Protection: Balassa A	Effective Protection: Corden A	Effective Subsidy: Balassa E	Effective Subsidy: Balassa D	Effective Subsidy: Balassa A	Effective Subsidy: Corden A
Agriculture, Forestry, & Fishing (I)	37	36	17	17	-16	19	18	17	-10	23	22	21
Mining & Energy (IV)	12	10	9	7	-1	4	3	3	3	5	5	4
Primary Activities (I+IV)	35	34	17	16	-8	18	17	16	-3	22	21	20
Processed Foods (II)	61	57	3	3	-3	-18	-17	-13	2	-25	-23	-18
Beverages & Tobacco (III)	141	135	2	2	-2	-19	-19	-15	15	-26	-24	-19
Construction Materials (V)	32	31	4	4	-5	-11	-11	-9	6	-17	-16	-12
Intermediate Products I (VIA)	37	31	3	2	31	-25	-19	-14	43	-30	-22	-16
Intermediate Products II (VIB)	59	53	21	19	0	26	24	16	17	20	19	13
Nondurable Consumer Goods (V)	92	68	12	9	-2	-11	-9	-7	5	-21	-15	-11
Consumer Durables (VIII)	98	78	39	31	-5	64	51	32	2	38	31	19
Machinery (IX)	53	49	30	28	-13	44	43	28	5	31	31	20
Transport Equipment (X)	62	62	55	54	-53 a/	163	164	83	-23 a/	159	159	80
Manufacturing (II, III, V-X)	68	59	12	11	3	-1	-1	-1	12	-9	-7	-5
Primary Production plus Processed Foods (I, II, IV)	41	39	14	13	-6	14	13	12	-1	17	16	15
Manufacturing, less Beverages & Tobacco (II, V-X)	61	52	13	11	3	1	1	1	12	-7	-5	-3
All Industries, less Beverages & Tobacco (I, II, IV-X)	50	45	15	13	0	12	11	9	8	11	11	10
Manufacturing, less Beverages & Tobacco and Processed Foods (V-X)	60	51	16	13	4	6	6	4	14	-2	0	0
All Industries (I-X)	54	49	14	13	0	11	10	8	9	10	10	9

Note: The initials used in the column headings are D for domestic sales, E for export sales, and A for all sales. Because of rounding, zero denotes any value greater than or equal to -0.5 and less than 0.5.

a/ Estimated value added in exports at exporters' producer prices and at world prices are both negative; as is explained in the text, the algebraic sign of the effective incentive rate has thus been reversed from that given by the conventional formula.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Annex Tables 2.A and 2.B.

Table 8.8. *Korea: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1968*
(percent)

Trade Category	Nominal Protection				Effective Protection				Effective Subsidy			
	Legal Tariff		Nominal		Balassa			Corden	Balassa			Corden
	D	A	D	A	E	D	A	A	E	D	A	A
Export Industries	82	51	8	5	1	-18	-11	-9	9	-26	-13	-10
Primary	6	1	-3	-8	-13	-14	-13	-12	-9	-21	-12	-11
Manufacturing	83	54	8	5	5	-18	-11	-8	13	-26	-13	-10
Export-&-Import-Competing Industries	73	44	37	23	-2	68	41	27	8	52	35	23
Primary	2	1	13	8	-1	13	6	5	3	17	10	9
Manufacturing	76	46	38	23	-2	73	45	29	9	55	38	24
Import-Competing Industries	48	47	36	35	-7	80	79	57	31	83	83	59
Primary	23	23	46	46	0	68	68	67	5	76	76	74
Manufacturing	56	55	32	32	-9	93	92	50	35	91	91	50
Non-Import-Competing Industries	50	49	9	9	0	4	4	4	7	4	4	4
Primary	37	36	13	13	1	13	13	13	9	17	17	16
Manufacturing	65	64	5	5	-1	-16	-16	-12	6	-24	-24	-18
All Industries	54	49	14	13	0	11	10	8	9	10	10	9
Primary	35	34	17	16	-8	18	17	16	-3	22	21	20
Manufacturing	68	59	12	11	3	-1	-1	-1	12	-9	-7	-5

Note: Because of rounding, zero denotes any value greater than or equal to -0.5 and less than 0.5.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Annex Tables 2.A and 2.B.

Table 8.9. *Korea: Simple and Rank Correlations between Indicators of Incentives, 1968*

	Nominal Protection				Effective Protection						Effective Subsidy					
	Legal Tariff		Nominal		Balassa			Corden			Balassa			Corden		
	D (1)	A (2)	D (3)	A (4)	E (5)	D (6)	A (7)	E (8)	D (9)	A (10)	E (11)	D (12)	A (13)	E (14)	D (15)	A (16)
(1)	---	.947	.366	.354	-.005	-.120	-.114	-.053	.120	.119	-.006	-.074	-.118	.050	.150	.106
(2)	.949	---	.388	.411	-.029	-.137	-.129	-.040	.117	.119	-.019	-.091	-.133	.045	.145	.105
(3)	.408	.431	---	.985	-.047	-.171	-.154	-.039	.092	.100	-.012	-.135	-.152	.229	.100	.097
(4)	.399	.455	.985	---	-.038	-.190	-.172	-.002	.070	.082	-.020	-.152	-.169	.223	.087	.079
(5)	-.090	-.114	-.155	-.172	---	.035	.092	.201	.068	.116	.022	.011	.081	.026	.048	.100
(6)	.215	.246	.886	.872	-.154	---	.689	.088	.968	.702	-.052	.961	.683	.038	.979	.700
(7)	.222	.240	.875	.870	-.118	.974	---	.254	.832	.988	-.112	.474	.975	.069	.744	.966
(8)	-.051	-.079	-.221	-.244	.775	-.239	-.206	---	.130	.214	-.025	.031	.229	.130	.095	.190
(9)	.220	.247	.894	.877	-.146	.997	.974	-.228	---	.853	-.055	.867	.819	.070	.978	.842
(10)	.223	.242	.880	.876	-.115	.973	.997	-.201	.978	---	-.081	.491	.963	.094	.764	.976
(11)	.032	-.017	.120	.089	.155	.115	.141	.030	.124	.143	---	-.020	-.094	.072	-.041	-.069
(12)	.090	.125	.814	.800	-.138	.952	.926	-.229	.951	.926	.193	---	.484	.035	.921	.504
(13)	.111	.113	.813	.799	-.098	.933	.958	-.192	.935	.956	.258	.957	---	.115	.758	.987
(14)	.053	.012	.167	.140	.178	.183	.211	.160	.189	.208	.839	.264	.332	---	.088	.153
(15)	.087	.123	.817	.803	-.131	.946	.922	-.219	.951	.926	.203	.996	.953	.269	---	.782
(16)	.106	.111	.814	.801	-.091	.931	.956	-.183	.937	.957	.263	.955	.997	.333	.957	---

Note: Simple correlation coefficients appear above the diagonal and rank correlation coefficients below the diagonal. Row titles omitted; each row title is the same as that of the column having the same numerical designation. Correlations of greater than 0.16 and 0.21 in absolute value are significant at the 0.05 and 0.01 levels, respectively.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Annex Tables 2.A and 2.B.

Table 8.10. *Korea: Frequency Distribution of Incentive Measures, 1968*
(percent)

Value		Legal Tariff		Nominal Protection		Effective Protection				Effective Subsidy			
						Balassa			Corden	Balassa			Corden
Greater than or equal to	Less than	D	A	D	A	E	D	A	A	E	D	A	A
-∞	-100					1	6	6	1	2	7	6	1
1000	∞						3	3	2		3	3	2
500	1000						5	4	1	1	4	5	
200	500	1	1				5	5	3	2	6	5	5
150	200	1					3	4	4		4	4	4
100	150	19	12	3	2		8	8	8	1	6	5	9
90	100	15	9	2	2		2		2	6	1	2	1
80	90	8	10	2	1		1	2	4	1	3	1	2
70	80	6	10	3	3	1	1	1	2	1	3	4	1
60	70	11	9	6	1		4	5	5	2	3	3	3
50	60	12	12	3	8		4	3	2	1	1	1	4
40	50	14	16	9	8		2	2		2	4	5	4
30	40	14	13	6	7	1	4	4	5	2	2	2	2
20	30	17	21	21	19	2	6	4	7	12	5	5	7
10	20	8	6	28	25	2	11	13	14	16	10	11	14
1	10	11	18	24	31	16	13	15	19	41	16	17	20
-1	1	13	13	39	39	17	1	2	3	13	1	3	3
-10	-1					87	21	23	29	26	9	13	21
-20	-10			1	1	13	20	19	24	13	21	20	23
-30	-20			1	1	2	14	15	6	4	16	16	15
-40	-30			1	1	2	5	4	5	1	11	11	4
-50	-40				1	4	6	5	2	2	6	4	2
-60	-50						3	1			3	1	1
-70	-60			1		1	1	2	2		3	2	2
-80	-70									1	1	1	
-90	-80												
-100	-90					1	1				1		
Over Entire Set													
Simple Average		55.8	49.2	19.8	18.1	-3.5	-66.1	-31.1	23.7	10.5	-115.4	-29.6	21.8
Coefficient of Variation a/		0.7	0.8	1.3	1.4	5.2	23.2	36.7	13.3	9.1	13.9	37.5	13.4
Over Reduced Set b/													
Simple Average		54.7	48.0	14.5	13.1	-3.5	20.8	20.2	10.3	11.4	14.1	15.9	7.7
Coefficient of Variation a/		0.8	0.8	1.4	1.4	3.2	3.3	3.2	3.7	3.5	4.7	4.0	5.1

a/ Standard deviation divided by the simple average.
b/ Excludes the 16 sectors for which one or more measures of effective incentives exceed 500 percent or for which value added in world prices is negative under at least one measure.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Table F.

ious incentive measures, as well as their simple averages and coefficients of variation.[42] The dispersion of legal protection rates was the least, and that of nominal protection rates slightly greater. Effective incentive rates varied much more widely, with sectors having world-price value added coefficients almost equal to zero falling at the extremes.[43] Effective subsidy rates ranged from −13,101 to +2,201 percent, with the mode of the distribution being the interval between −20 and −10 percent (the median is between 2.5 and 3.0 percent).

To remove the effect of extreme observations, Table 8.10 presents simple averages and coefficients of variation for a reduced set of sectors, including only those in which value added at world prices was positive according to every measure, *and* for which the incentive rate was less than 500 percent. The cutoff at 500 percent is admittedly arbitrary; however, there were very few instances of effective incentive rates within a wide band from 200 to 500 percent. Even with the extreme observations excluded, effective incentive rates were appreciably more dispersed than nominal or legal protection rates. Effective subsidy rates varied somewhat more widely than did effective protection rates.

Measurement according to the Corden convention, whereby value added includes that indirectly generated in the production of nontradeable goods, yields rates that are slightly lower and slightly less dispersed over the entire set of sectors than rates obtained under the Balassa convention. Only one sector has negative value added at world prices under the Corden definition; there are six such sectors according to the Balassa measure. The rank correlation between Corden and Balassa average effective protection rates is 0.99; it is the same between Corden and Balassa effective subsidy rates.

RELATIVE INCENTIVES TO PRIMARY PRODUCTION AND MANUFACTURING. In Korea, unlike most developing countries, primary production, particularly agriculture, received higher effective protection (17 percent) than did manufacturing (−1 percent). Nominal, though not legal, protection in the domestic market was higher on agricultural products than on manufactured goods, and the nominal protection of inputs was lower for agriculture than for manufacturing (Table 8.7).

Primary industries received additional real income through Korea's business income tax system, which levied no direct taxes on farmers and low taxes on mining, and this was only slightly offset by the less favorable credit preferences they received. As a result, the effective subsidy rate on manufacturing was −7 percent, compared with the effective protection rate of −1 percent, while for primary industry the corresponding averages were 21 and 17 percent.

Table 8.7 also gives averages for manufacturing except for beverages and tobacco, since protection on these commodities is often used as a tax on consumption rather than a means of encouraging domestic production. Beverages and tobacco had the highest legal tariff rates of any industrial group, but almost none of this protection was realized. In consequence, these products received a negative effective subsidy, and their exclusion from the average for manufacturing raises, rather than lowers, the effective subsidy rate on manufacturing production as a whole.

Several food processing industries (particularly seaweed and other processed seafood) could be considered part of the primary sector because much, if not all, the processing is done by the primary producers. Table 8.7 shows averages for the primary sector including processed food and for manufacturing excluding beverages and tobacco and processed food. The inclusion of processed food within the primary sector reduces effective incentive rates for the latter and raises those for manufacturing, particularly to domestic sales of manufactured goods, for which the average effective subsidy rate is increased from −9 to −2 percent. The conclusion that primary production received higher effective incentives nonetheless remains unchanged.

The high effective incentives to agriculture stemmed from two factors. First, Korea appears to lack a comparative advantage in its major food grain crops. To judge by effective subsidy rates, its comparative advantage within agriculture appears to lie in pulses and miscellaneous cereals, potatoes, tobacco, medical crops, fruit, and livestock.[44] Second, the pursuit of self-sufficiency in food production, particularly in food grains, along with the desire to increase farmers' incomes, has given rise to measures to subsidize agriculture. Through import restrictions, for example, the price of rice was maintained at more than 13 percent above the world price in 1968.

Forestry, fishing, and mining received effective incentives well below those to agriculture, though somewhat in excess of those to manufacturing. Forestry is underdeveloped in Korea because firewood was the major source of fuel for centuries and the forests were gradually depleted.[45] In comparison, Korea appears to have a modest comparative advantage in fishing and most minerals, on which effective subsidy rates were comparatively low. Within mining, only gold, silver, and copper ores and raw salt had very high effective incentive rates, while coal, representing almost half of Korea's total mineral production, had an effective subsidy rate of 8.7 percent. Korea's advantage in producing many minerals may soon disappear since most of its readily exploitable reserves have been exhausted, and rapidly diminishing returns to further extraction appear to have been reached, notably in coal mining.

INCENTIVE RATES BY TRADE CLASSIFICATION. Table 8.8 shows average incentive rates according to trade clas-

sification. Among the primary groups, legal tariffs were highest on non-import-competing commodities (37 percent) and lowest on export (6 percent) and export-and-import-competing (XIC) goods (2 percent). The ranking changes somewhat for nominal protection rates: import-competing commodities had the highest protection (46 percent) and export commodities the lowest (−3 percent). There was only one import-competing primary sector—barley and wheat—and import controls made its nominal protection more than twice the legal rate. Two mineral sectors, including gold, silver, and copper ores, made up the primary XIC group. All primary export products except for medical crops (including ginseng) were also minerals. Fishing and nine of the eleven agricultural sectors were non-import-competing, as were several of the mining sectors, including coal and salt. Thus, it is almost correct to say that the primary export products were minerals whereas the primary non-import-competing products were agricultural commodities and fish. Primary non-import-competing commodities had higher nominal incentives than primary export commodities, which is consistent with agricultural products having higher legal and nominal protection rates than minerals.

Corresponding to the higher effective incentive rates on agricultural products than on minerals, primary export products also received lower effective incentives on all measures than did primary non-import-competing products. For example, the average effective subsidy rate for export commodities was −12 percent, while for non-import-competing goods it was 17 percent (Table 8.8). Barley and wheat, the only import-competing primary sector, had almost the highest effective incentive rates in the primary group. Largely because of restrictions on gold imports, average effective incentive rates for XIC production were almost the same as those for non-import-competing production, although non-metallic minerals, the other XIC commodity group, received negative effective incentives.

Rankings of average incentives to primary production for all sales destinations are the same whether one employs the Balassa or Corden conventions. If employed as indicators of comparative advantage, they all suggest that Korea's comparative advantage within primary products lies in the products that were exported, chiefly minerals, and that Korea does not have a comparative advantage in many non-import-competing agricultural products.

Table 8.8 also shows that within manufacturing the weighted average legal tariff rate was highest on export commodities (83 percent) and lowest on import-competing products (56 percent). The pattern of nominal protection is nearly the opposite: XIC and import-competing products received the greatest average nominal protection (38 and 32 percent, respectively), and export and non-import-competing commodities received the least (8 and 5 percent, respectively). Average nominal protection within each trade category was substantially less than legal protection; the difference was largest for export and non-import-competing commodities, for which the average nominal protection rate was less than a tenth of the average legal tariff rate.

The pattern of nominal protection for manufacturing carried over to the effective subsidy rates. Import-competing commodities, followed by export and import-competing products, received the highest effective subsidies; non-import-competing commodities, followed by export products, received the lowest effective subsidies. Average effective subsidies were positive for the former categories and negative for the latter, as is illustrated below:

	Export sales	*Domestic sales*	*Average*
Export industries	13.5	−26.2	−13.4
Export-and-import-competing industries	8.7	55.0	37.9
Import-competing industries	35.3	91.4	90.7
Non-import-competing industries	6.1	−24.3	−23.7

If the estimates of effective subsidies are indicative of comparative advantage, it would appear that Korea's major manufactured exports were efficiently produced, as were manufactures that did not compete with imports. However, this generalization is not equally valid for all commodities so classified. Of 19 export commodities, 5 had effective subsidy rates greater than 10 percent: cotton fabrics, other manufacturing, plywood, ribbon, tape and string, and optical instruments. Two others had rates greater than zero but less than 10 percent: knitted products, and other leather products. Seventeen of 51 non-import-competing manufactures had positive effective rates of subsidy, 11 of which exceeded 20 percent: worsted and woolen yarns, paint and printing ink, measuring instruments, hemp and flax yarns, bakery products, jewelry and lacquerware, pesticides, straw products, charcoal briquettes (a prime source of heat), other electrical equipment, and electric motors.

In contrast, only 10 of the 53 import-competing and XIC products had *negative* effective subsidy rates: soap and surfactants, household metal products, medical and sanitary instruments, other textile products, nonferrous metal products, toys and sporting goods, textile machinery, metal-working machinery, glass products, and general industrial machinery. On the average, commodities that were both exported and sold in competition with imports were more efficiently produced than import-competing commodities. Among the former group were several textile products, nonferrous metal products, metal implements, electric and electronic

Table 8.11. *Korea: Dispersion of Effective Subsidy Rates, by Trade Category, 1968*

Trade Category	Over Entire Set [a/]			Over Reduced Set [a/]		
	No.	Average	C.V.	No.	Average	C.V.
Export Industries	27	5.9	10.8	26	6.2	10.5
Export-&-Import-Competing Industries	18	64.4	2.8	15	24.8	1.7
Import-Competing Industries	38	-218.2	-10.0	28	45.1	1.5
Non-Import-Competing Industries	67	37.8	5.7	65	5.1	11.4

Note: Based on effective subsidy rates to total sales computed under the Balassa convention. The "Entire Set" refers to the full set of 150 sectors; the "Reduced Set" excludes the 16 sectors for which one or more measures of effective incentives exceeds 500 percent or for which value added in world prices is negative under at least one measure.

a/ The column headings are No. for number of sectors that are included; Average for simple average, in percent; and C.V. for coefficient of variation, which equals the standard deviation divided by the simple average.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Annex Table 2.B.

products, and several other miscellaneous products. Most prominent among the inefficiently produced import-competing products were pulp and paper, several chemicals, pig iron, several steel products, and machinery and transport equipment.

One contrast between the patterns within the primary and manufacturing sectors deserves note. The average effective subsidy rate on non-import-competing primary commodities was 17 percent; it was −24 percent on non-import-competing manufactures (Table 8.8). Within the primary sector, domestic production of non-import-competing commodities was thus more highly protected and apparently less efficient than domestic production of export commodities, but the reverse was true in manufacturing. The government's policy toward the agricultural sector explains this difference to a large extent, since non-import-competing primary production can be identified with agriculture.

For the primary and manufacturing sectors together, Table 8.11 shows the dispersion of effective subsidies to total sales within each commodity category. Over the entire set of observations, the subsidies to export-and-import-competing commodities and non-import-competing commodities have the lowest coefficients of variation, and those on export commodities have the highest. However, in terms of standard deviations (equal to averages times coefficients of variation), export commodities show the least variation.

Extreme observations are highly sensitive to small errors in the estimation of value added coefficients in world prices, so that interest also attaches to the dispersion of effective subsidy rates excluding these. Extreme observations (conversely, the reduced set of observations) are defined here as in Table 8.10. A disproportionate number of these fall in the import-competing category, so that their exclusion substantially reduces the absolute magnitude of the coefficient of variation for this category. The further exclusion of just one observation (cotton fabrics, having an effective subsidy rate of 298 percent) reduces the coefficient of variation for export products to 5.7, the corresponding standard deviation being 31 percent. Dispersion indexes over the reduced set of observations for XIC and non-import-competing commodities are not similarly sensitive to the further exclusion of one or two outlying observations.

The foregoing analysis leads us to conclude that the intersectoral variation of incentives among export commodities was considerably less than that among any other commodity group. This conclusion is somewhat different from, but nonetheless parallel to, the result

shown in Table 8.10, in which the dispersion across all sectors of effective incentive rates was far less for export sales than for domestic sales.

THE STRUCTURE OF EFFECTIVE SUBSIDIES WITHIN MANUFACTURING. Table 8.7, which gives the averages of incentive rates by industrial group, shows that processed foods and beverages and tobacco both received negative average effective subsidy rates (−23 and −24 percent, respectively); but individual industries producing dairy products, canned seafoods, bakery products, other food preparations (mainly seasonings and cooking oils), and alcoholic beverages other than beer received positive effective subsidy rates. All construction materials, here defined to include stone products, cement, and clay, had negative effective subsidy rates (the weighted average was −16 percent). The average effective subsidy rates for intermediate products I and II, which were negative (−22 percent) and positive (19 percent), respectively, conceal a wide dispersion of rates, both positive and negative. That the average effective subsidy rate for higher level intermediate products was positive is partly explained by the larger share of import-competing and export-and-import-competing commodities in the latter. The sectors with positive average effective subsidy rates included *some* textile yarns and fabrics, plywood, charcoal briquettes, pulp, paper products, several chemical products including fertilizer and pesticides, and a number of metal products.

The average effective subsidy rate on nondurable consumer goods was −15 percent, which conceals a great deal of dispersion; slightly more than half the products classified under this heading (two thirds of which were export or non-import-competing) received positive effective subsidy rates. Four of the six products in the consumer durables group had positive effective subsidy rates, so that the average (31 percent) for this group was well above that for manufacturing as a whole.[46] Machinery, which had an average effective subsidy rate almost identical to that of consumer durables, can be subdivided into three groups by the type of machinery and the degree of effective incentives received. Negative effective subsidy rates applied to nonelectrical machinery for which production was well established, such as metalworking machinery, mining and construction machinery, and textile machinery. Other nonelectrical machinery had positive effective subsidy rates, as did electrical machinery.

Transport equipment had the highest average effective subsidy rate, which was more than 150 percent. Automotive repairs was the only non-import-competing sector, and it alone received negative effective subsidies. Ships, railroad equipment, and motor vehicles received above average nominal protection, the rate on motor vehicles being 90 percent. In 1968 almost all domestically produced motor vehicles were assembled from imported components.

Incentives in the Domestic Market

Korean incentive policies can be better understood by examining separately the measures affecting sales in the domestic and export markets. This section considers incentives to domestic sales and presents a detailed examination of the structure of nominal protection, which is the principal determinant of incentives in the protected domestic market.

THE STRUCTURE OF NOMINAL INCENTIVES. Overall, the Korean legal tariff structure in 1968 was similar to that in several other developing countries. It was characterized by escalation, with the highest tariffs on finished products, although tariffs on capital goods were lower than those on finished consumer goods (Table 8.7).

By contrast, nominal protection showed a pattern of reverse escalation, since it was higher on inputs than on outputs.[47] Among the various industrial groups, average nominal protection on inputs into the processed foods and beverage and tobacco industries exceeded that on their outputs by a rather wide margin. For intermediate goods, nondurable consumer goods, and machinery, average nominal input protection exceeded average nominal protection on domestic sales, but nominal protection on total sales was generally similar for both inputs and outputs. The only industry group showing a marked escalation of nominal protection was transport equipment.

At the sectoral level, escalation was most frequent when nominal protection on the output exceeded 35 percent, since nominal input protection rates were densely clustered between 15 and 35 percent. The highest rate of nominal input protection among the 150 sectors was 66 percent, and very few sectors experienced nominal input protection in excess of 40 percent. Reverse escalation prevailed in the more than seventy-five sectors whose effective protection rates were negative. Reverse escalation also characterized a number of sectors for which effective protection was positive.

To illustrate the disparate patterns of escalation found, we discuss nominal protection on textile products. Reverse escalation was found for cotton, silk, and other yarns, while output protection exceeded input protection for worsted and woolen yarns, hemp and flax yarns, and synthetic resins and fibers. There was escalation of nominal protection for cotton and silk fabrics, and reverse escalation for worsted and woolen, hemp, rayon, and other fabrics. Thus, for worsted and woolen and hemp textiles, high nominal protection on yarn led

to tariff escalation for yarn and reverse escalation for fabric. Zero nominal protection on yarn led to the opposite result for cotton and silk textiles. Knitted products were the only finished textiles on which tariffs escalated.

We are unable to explain why the structure of nominal protection differed for similar products at the same processing stage (for example, all yarns, all fabrics). Although errors in observation may be responsible, these disparities would remain even if the errors were relatively large. There may have been significant differences in the comparative efficiency of production at the same stage of processing, or differences in market structure may have allowed monopoly profits on some products but not on others.

The product chain leading from iron ore to semifinished steel products is also interesting. While protection escalated for pig iron, there was reverse escalation for steel ingots. The latter is to be attributed not to the protection afforded pig iron but to the tariff on imported iron and steel scrap that was used to produce most of Korea's steel in 1968. There was strong tariff escalation for most steel products, but equally strong reverse escalation for iron bars and frames, cast and forged steel, and metal construction products.

The three products just mentioned can be efficiently produced on a small scale. Steel sheet, bars, and pipe, by contrast, are efficiently produced only in large-scale integrated steel mills, yet plants in Korea producing these products were of quite small scale;[48] correspondingly, nominal protection on these products was well above the average for manufacturing. A similar pattern is shown for nonferrous semifinished metal products, although copper and other nonferrous metals were more highly protected than were the refinery inputs. Insulated wire and cable, a rather sophisticated product most efficiently produced at reasonably large scale, benefited from tariff escalation, whereas nonferrous metal primary products, mainly castings, were subject to reverse escalation.

ADDITIONAL INCENTIVES TO DOMESTIC SALES. Nominal protection arising from tariffs and import controls was not the only incentive operating in the domestic market. Indirect tax rates on domestically produced and imported varieties of the same product differed in many instances, but with little effect on the structure of incentives. Indirect taxes on domestic production were commonly levied on the raw material rather than the finished product; as a result, finished or semifinished imports were subject to indirect taxes whereas comparable domestically produced varieties were not. At the same time, at each stage of production, from the raw material through the various semifinished stages to the finished product, indirect tax rates on imports become progressively smaller than those on the raw material. The differentials in indirect tax rates on domestically produced and imported varieties thus appear to have been set so as to avoid the bias against domestic processing that would result from levying all indirect taxes on raw materials alone. Put differently, the incidence of indirect taxes at the stage of final purchase appears to have been equalized with respect to the stage at which imports entered.

Most production for sale in the protected domestic market was subject to indirect taxes on output and inputs, and in addition paid the protected domestic price for domestically produced inputs and the full legal tariff on imported intermediate and capital goods. There were, however, some exceptions.[49] Certain favored industries were completely or partly exempted from indirect taxes and tariffs on selected intermediate inputs; they included fishing nets, which were completely exempt from commodity taxes on their fiber inputs; drugs, pesticides, and fertilizers, which were exempt from the petroleum products tax; cotton yarn, which had a 50 percent tariff reduction on fiber; synthetic resins, which had tariff reductions of more than 50 percent on noncompetitive chemicals and plastic materials; pig iron, steel, and semifinished steel products, which had 50 percent tariff reductions on their principal ferrous inputs; and motor vehicles, which were exempt from tariffs on components. Most of those favored with exemptions were heavy, import-substituting industries that had been singled out for rapid development in the second and third five-year plans. Some of them were among a group of industries receiving complete tariff exemptions on imported capital goods. Such exemptions granted to specific industries have been taken into account in estimating the input costs at producer prices necessary to calculate effective incentive rates. We have ignored exemptions from customs duties on imported capital goods that were granted solely on the basis of the type of financing because of the lack of sufficiently detailed information on the sectors receiving such preferences.

In addition, several industries received preferential direct tax treatment, including investment tax credits, on income derived from domestic sales. Lastly, the government's virtual control of the banking system permitted interest rate differentials and credit rationing to be used as incentive measures. These measures were particularly important since there was a continual excess demand for funds at the commercial bank lending rates. Although its effects could not be quantified precisely, the credit rationing system seems to have favored mainly those industries receiving high effective incentives for domestic sales.

A small number of industries further benefited from the formal establishment of special funds for preferential loans. For example, a special fund for low-interest loans

to machinery producers was set up in 1968.[50] The government also restricted access to foreign capital funds in order to direct resource allocation and grant implicit subsidies, since the effective real interest rate on foreign borrowing was much lower than that on nonpreferential domestic loans.[51] Incentives granted through preferential direct tax and credit treatment are incorporated in our estimates of effective subsidy rates, in the manner already outlined.

The volume of unprotected domestic sales has been estimated through an input-output calculation to be equal to deliveries of intermediate inputs to exporters. In world prices, total commodity sales on unprotected markets amounted to 3.1 percent of total domestic commodity sales. For some commodities, however, the proportion sold on the unprotected market was much higher: For example, it was 42 percent for cotton yarn and 23 percent for worsted and woolen fabrics.

It has not been possible to estimate the total volume of machinery sales on the unprotected market because, as noted earlier, we were unable to estimate the magnitude of domestic machinery sales competing with imports of capital goods that for various reasons were exempted from customs duties. Two other types of sales in the unprotected market have also been omitted from consideration. We have neglected sales of intermediate inputs to producers of indirect exports, although these sales were also unprotected, because indirect exporters received the same tariff and indirect tax exemptions as did direct exporters. Likewise, we have neglected sales of intermediate inputs to those import-substituting industries that received tariff reductions (and sometimes exemptions) on their imported intermediate inputs. Although these omissions have led us to underestimate sales on the unprotected market, it is likely that we have overestimated the volume of indirect exports by assuming that the division between imported and domestically produced intermediate inputs going into exports was the average division for the sector. Use of input-output statistics entails this assumption, but there is evidence suggesting that exporters relied more heavily on imported intermediate inputs to produce products identical to those being made for the domestic market.[52]

Since indirect exports received incentives identical to those granted to exports, separate estimates of incentive rates for indirect exports are not shown. As noted previously, incentive rates for the domestic market have been averaged over protected and unprotected sales.

EFFECTIVE PROTECTION AND SUBSIDIES TO DOMESTIC SALES. Given the high proportion of domestic sales in total sales, the level and structure of effective incentives on the domestic market were broadly similar to those pertaining to total sales.[53] The rank correlations between effective protection and subsidy rates on domestic and total sales are 0.95 and 0.96, respectively (Table 8.9). In view of these similarities, we confine our discussion to the most important results, which concern the role of direct tax and credit subsidies.

The high rank correlation (0.95) between effective protection and subsidy rates on domestic sales demonstrates that direct tax and credit subsidies had only a limited influence on relative incentives within the domestic market. However, these subsidies resulted in a disincentive to domestic sales of manufactured goods. They increased the effective incentives for only 22 of the 123 manufacturing sectors, including cement, pig iron, pulp, several chemical products, fertilizer, several steel products, electronics, and several types of transport equipment. Most of these sectors received high effective protection, but in several cases—for example, pulp and fertilizers—tax and credit preferences were sufficient to transform negative effective protection rates into positive effective subsidy rates. Thus tax and credit preferences added to the effective incentives given to the import-substituting industries most favored by the government.

We may conclude that the major incentive policy with respect to production for the protected domestic market in Korea was the structure of nominal protection rates, so that estimates of effective protection are reasonably good predictors of the net effect of all policy instruments operating within this market. This conclusion must be qualified, however, to the extent that we have been unable to quantify satisfactorily some incentive measures, for example, credit rationing.

Incentives in the Export Market

As noted earlier, more than two thirds of total export incentives were in the form of exemptions from tariffs and indirect taxes. Of the remaining incentives, interest preferences followed by wastage subsidies and direct tax reductions were the most important. The total export subsidy in relation to world prices in 1968 was 8.4 percent of the value of exports.

EFFECTIVE PROTECTION TO EXPORTS. The effective protection estimates for exports incorporate the effects of tariff and indirect tax exemptions, wastage allowance subsidies, and reductions in overhead costs.[54] Apart from the subsidies explicit in the wastage allowance system and implicit in the domestic purchase of inputs at domestic prices below world prices, producers of direct (as well as indirect) exports paid world prices for commodity inputs and received world prices for their output.[55] Some exporters also received overhead subsidies. All exporters, however, paid indirect taxes on

nontradeable inputs; their prices were further inflated by nominal protection on the inputs used to produce them.[56] In the aggregate, negative incentives from the purchase of nontradeable intermediate inputs were more than offset by wastage allowances, overhead rate reductions, and purchases of domestically produced inputs at prices below world market prices. Thus, exporters received a subsidy on input purchases equal to 1.2 percent of the total value of the inputs used, and the result was effective protection on value added of 0.4 percent.

On closer examination, however, one finds that in only a few sectors was the rate of nominal protection on inputs to export production negative, denoting a subsidy to exporters. Among the major exporting sectors,[57] each of which separately accounted for more than 1 percent of total merchandise exports in 1968, only medical crops, fishing, petroleum products, plywood, rayon fabrics, other fabrics, and rubber shoes received negative nominal protection on inputs. For the first three of these, a single major input purchased at the domestic, less-than-world price is responsible; these inputs are ginseng seeds and seedlings, petroleum products to power fishing vessels, and petroleum products that require further refining. For the remaining exports in this group, the cause of negative nominal input protection was the wastage allowance on a principal imported intermediate input without a Korean substitute. The largest subsidy went to plywood exports, which had a nominal input protection rate of −11.8 percent.

Indeed, the negative nominal rate of protection on inputs for manufactured exports, and therefore the positive rate of effective protection on manufactured exports as well, may be traced directly to the wastage allowance on imported roundwood used in plywood production. Our estimates indicate that plywood exports accounted for 13.6 percent of total exports and 15.5 percent of manufactured exports, while imports of roundwood accounted for 46.6 percent of the total wastage allowance subsidy on exports. Nominal protection on imported roundwood was high because imports were controlled. Moreover, Korea produces no timber of large dimensions, and much of the lumber used domestically was processed from the excess wastage of roundwood allowed to plywood exporters.

Fourteen principal exports were produced with few or no imported direct inputs and hence received positive nominal protection on their inputs because of the negative incentive that stemmed from the use of nontradeable intermediate inputs. A few of these exports—for example, iron ore—were primary commodities. Most others—such as processed seafood, cement, and silk yarn—were processed primary commodities or products based on indigenous raw materials. The remainder were based on locally produced intermediate inputs, for which the principal inputs were imported. For example, exports of cotton and worsted and woolen fabrics used domestically produced yarns, which in turn required imported raw cotton and wool. To reflect what appears to have been the typical pattern in such cases, we assigned the wastage allowance subsidy to the production of the indirect export. In the instance cited, for example, we assumed that the yarn producer received the subsidy on fiber inputs. In fact, some of the subsidy in such cases may ultimately have accrued to the direct exporter, so that we have probably somewhat understated (overstated) the wastage allowance subsidy to some direct (indirect) exporters.[58]

EFFECTIVE SUBSIDIES TO EXPORTS. Direct tax and credit preferences accounted for 8.2 percentage points of the 8.6 percent effective subsidy rate on total export sales. These preferences had a significant impact on the structure of export incentives among industries; the rank correlation between effective protection and subsidy rates on exports was only 0.15, which is barely significant at the 0.05 level.

The frequency distributions shown in Table 8.10 explain the lack of correlation between effective protection and subsidy rates on exports. Among the 150 estimated effective protection rates, 87 are clustered about the mode interval of −1.0 to −10 percent, while among the effective subsidy rates, only 41 fall within the mode interval. With the exception of wastage allowance subsidies, which were important for only a relatively small number of commodities, and overhead rate reductions, which were given to only a few sectors and were comparatively small in total value, the remaining instruments of *protection* did not discriminate among export activities to a very large extent, since their major thrust was to permit exporters to purchase inputs at world prices.

By contrast, direct tax preferences discriminate between export activities that make a profit and those that do not. Relating tax preferences to value added, they further discriminate among export activities because the relationship between gross profits and value added varies among export activities. Short-term credit preferences also discriminate among export activities since their implicit subsidy value is almost proportional to the gross value of exports and thus varies inversely with the ratio of value added to sales. Long-term credit preferences may also discriminate; at least they are not formally linked to value added in world prices.

The observed discrimination and the resulting low correlation between effective protection and subsidy rates in Korea should not, however, be taken to imply purposive *and selective* intervention through the use of tax and credit instruments, since these were neutrally ap-

plied, albeit with respect to criteria that are poorly correlated with value added in world prices.

THE STRUCTURE OF EXPORT INCENTIVES. The overall average effective subsidy rate on export sales (8.6 percent) happened to be the same as the average effective export subsidy rate for export commodities. Among primary products, export commodities were the only ones to have negative effective subsidies (Table 8.8). Within manufacturing, the effective subsidy rate for exports was 13 percent, which was 55 percent above that for export-and-import-competing commodities and 121 percent above that for non-import-competing commodities. Import-competing commodities had the highest effective subsidy rate on exports within manufacturing.

The structure of effective subsidies to exports by industrial group indicates that manufactured exports were favored over primary exports, the average subsidy rates being 12 and −3 percent, respectively (Table 8.7). Direct tax exemptions provided only a minor subsidy to primary exports since little of primary production was liable to direct taxes. Credit preferences and the wastage allowance subsidy were likewise largely directed to manufactured exports. Mineral exports, which benefited from reduced transport rates, had an effective subsidy rate of 3 percent compared with that of −10 percent on exports of agricultural products and fish. Within manufacturing, the highest effective subsidy rates to exports were those on intermediate products I (43 percent), intermediate products II (17 percent), and beverages and tobacco (15 percent). Except for exports of transport equipment, which had an effective subsidy rate of −23 percent, export sales from the remaining manufacturing industries had effective subsidy rates of between 2 and 6 percent (Table 8.7).

At the sectoral level, most sectors that received high effective subsidies on their export sales were either import-competing or XIC, and they also benefited from high effective subsidies on domestic sales. In two of these sectors, and in seven other import-competing and XIC sectors as well, value added in exports at the prices paid and received by the producer (that is, exporters' producer prices) is estimated to have been negative.[59] We doubt that producer price value added in exports was actually negative in these sectors. Rather, it was probably positive but very small, so that even slight errors of measurement or aggregation would result in negative estimates.[60]

We estimate that before-tax business income from export sales was negative in two export sectors (cotton fabrics and other manufacturing) and in nine out of eighteen XIC sectors, including silk fabrics, photographic materials, office and service machines, and household electronic equipment. (Before-tax business income is equal to sales receipts less intermediate input costs, wages, rent, depreciation, and interest, all at producers' prices.) For some of these sectors our estimates may be in error. Exports, however, may in fact be sold by private producers at prices below average costs if overall profits are thereby increased. Thus, export prices may more than cover marginal costs and yet be below average costs. Alternatively, the incentive system may link sales on a highly profitable domestic market to export performance, for example, by confining access to vital raw material imports only to exporters. Indeed, the eleven sectors for which before-tax business income from exports is estimated to have been negative are also those that received the highest effective protection on both domestic and total sales out of the entire set of export and export-and-import-competing sectors. Before any conclusion is reached, however, it is necessary to examine the relative incentives to exports and domestic sales across all the export and export-and-import-competing categories.

Relative Incentives to Exports and Domestic Sales

By far the most interesting aspects of Korea's incentive policies are the relative incentives given to exports and domestic sales. In the aggregate, the instruments of protection favored domestic sales over export sales; domestic sales received higher effective protection both in primary activities and in manufacturing excluding beverages and tobacco and processed foods. The converse, however, was true for many important sectors. There was a slight bias in favor of exports in the case of medical crops and mining activities, and except for talc these primary export sectors received negative protection on domestic sales. Exports were favored over domestic sales in every manufacturing industry group except intermediate products II, consumer durables, machinery, and transport equipment, which in turn were the only industry groups to receive positive effective protection on domestic as well as on total sales. The last three industries contributed only 5.7 percent of manufactured exports and should by all accounts be considered to include many high-cost import-substituting activities, most of which were firmly established only after 1960.

Exports generally benefit when the effective rate of protection on domestic sales is negative because nominal protection is higher on inputs than on domestic sales of output. Subsidies in the form of direct tax and credit preferences increase the relative incentives to export. As a result, the overall bias against export sales in Korea is reduced to nearly zero once these incentives are incorporated into the analysis.[61] Tax and credit policies do not change the direction of bias in the averages by industrial

group or trade category from that under protection measures alone; they either reduce the apparent bias of protection against exports or intensify that in favor of exports.

If measured by the spread between effective subsidy rates on exports and on domestic sales, then the bias in favor of exports was greatest among the sectors manufacturing for export (40 percentage points), followed by the non-import-competing manufacturing sectors and the primary export sectors. These are the only trade categories in which effective subsidies were biased in favor of exports; because they alone had negative effective subsidies on total sales, it appears that, at least on the average, production in these sectors was comparatively efficient.

Within manufacturing, tax and credit preferences strongly favored the production of import-competing commodities. Indeed, import-competing products had the highest average effective export subsidy rate among all trade categories, although they had the lowest effective protection rate among manufactured exports. Producers of import-competing commodities received a disproportionate share of preferential credit, which in their case was long-term credit aimed at stimulating domestic production regardless of sales destination. Two sectors, fertilizers and "other" (that is, synthetic) yarns, illustrate the point. Together these sectors accounted for 40 percent of the exports of import-competing commodities. Our estimates indicate that fertilizer production received 10 percent of total interest subsidies to all activities; the corresponding figure for other yarns was 4.3 percent. Given the magnitude of credit subsidies to these sectors, coupled with tax preferences for exports, it is not surprising to find that the effective export subsidy rates on fertilizer and other yarns were 61 and 56 percent, respectively, while the effective protection rates were −11 and 7.4 percent. In these cases, as in several others, large-scale credit subsidies benefited exports as well as domestic sales.

The overall rank correlation coefficient between effective subsidy rates on exports and domestic sales is only 0.19. The correlations are also low among sectors in the same industrial group or trade category. This finding is of considerable interest and will be analyzed with respect to Korea's major exports.

The table below lists major export sectors within manufacturing (each of them accounting for more than 1 percent of Korea's merchandise exports), according to whether the effective subsidy rate was greater on domestic sales or on exports. (An asterisk indicates higher effective *protection* given to domestic sales.) Of the major export sectors within manufacturing, the table excludes cement and petroleum products, for which effective subsidy rates were higher on export sales, and processed foods, a group in which the export sectors universally had higher effective subsidy rates than domestic sales. The table also shows three XIC sectors that fall into the category of major export sectors.

	Higher effective subsidy to export sales (type E)		*Higher effective subsidy to domestic sales (type D)*
VI-A	Silk yarn	VI-B	*Worsted and woolen fabrics
	Rope and fishing nets		*Other fabrics (XIC)
	Plywood	VII	*Knit products
VI-B	*Cotton fabrics		*Ribbon, tape, and string
	Rayon fabrics		*Processed bristles (wigs)
VII	Apparel and Accessories		*Other manufacturing
	Other textile products (XIC)	VIII	*Electronic components (XIC)
	*Other leather products		
	Rubber shoes		
	Optical instruments		

The type E sectors listed above together accounted for 46 percent of total manufactured exports in 1968; the share of the type D sectors was 27 percent.[62] In absolute magnitude, the spread between effective subsidy rates on exports and on domestic sales ranged from 0.3 (other fabrics) to 164 (plywood) percentage points.

With two exceptions, type E products had zero or low nominal protection on domestic sales and received negative effective protection in the domestic market. Only in the case of the exceptions—cotton fabrics and other leather products—were tax and credit preferences responsible for the subsidy bias toward export sales. Only four of the type E products—plywood, rayon fabrics, rubber shoes, and optical instruments (exports of eyeglass frames and lenses)—received positive effective protection on exports; its source was the wastage allowance on their principal imported inputs. Plywood, optical instruments, and the two exceptions noted previously were the only type E sectors in which the effective subsidy rate on total sales exceeded the overall average for manufacturing. Thus, of the ten type E sectors, six appear to have been relatively efficient export producers for which the domestic resource cost of earning foreign exchange was comparatively low.

In contrast to the type E products, the type D products received higher than average nominal protection on domestic sales,[63] and their effective subsidy rates on total sales were higher than the overall average for manufacturing.[64] Thus the type D sectors appear to have been relatively inefficient exporting sectors for which the cost of earning foreign exchange was comparatively high.[65] Two of these sectors, other fabrics and other manufacturing, used enough imported inputs for the input subsidies they received via the wastage allowance system to raise the effective protection rate on their exports above

zero. Nonetheless, domestic sales received higher effective protection than did exports in all these sectors.

The foregoing analysis suggests that exports were favored in those export industries in which Korea had a comparative advantage. This generalization is equally valid for primary and processed food export commodities and for those XIC commodities not considered in detail.[66] The bias of incentives toward exports in the efficient sectors resulted not from high input subsidies or tax and credit preferences on exports, but rather from the very low, usually negative, effective protection they received in the domestic market. There were, however, several exceptions where either high input subsidies (plywood) or tax and credit preferences (cotton fabrics and other leather products) favored exports.

A second generalization is that exports that were inefficiently produced appear to have been subsidized by sales in the domestic market. Differential pricing such as this might reflect simply the effect of government incentives in lowering the financial cost of producing for the export market. In this case, however, the price differential was clearly greater than can be explained thereby, since neither effective protection nor subsidy rates were equal in both markets. As suggested at the conclusion of the preceding section, differential pricing can be explained in terms of discriminating monopoly without implying that government policy has played a role. Nonetheless, there is evidence, albeit indirect, that the government has subsidized these exports through high nominal protection on the domestic market by fostering institutional mechanisms that link incentives for domestic sales to satisfactory export performance.[67]

In many instances where differential pricing appears to have been practiced, export sales were encouraged by institutional factors. Export targets were apportioned among firms through negotiations between the government and exporters' associations; indeed, in some industries for which competing imports were restricted, exporters, acting through manufacturers' associations in the domestic market, appear to have acted as a cartel in restricting domestic sales. In turn, the granting of import licenses, credit allocations, and income tax assessments was often conditional on satisfactory export performance. And, in certain cases, when production depended on imported raw materials, this took an extreme form in that domestic sales were not possible without exporting to obtain the necessary imports.

In these cases, high effective incentives to domestic sales must be interpreted, at least in part, as a subsidy to exports, although to determine by how much is beyond the scope of this study. Our estimates of effective incentives understate the true subsidies that these exports received, but one can compare the effective subsidy on total sales with the share of exports in total sales to gain an impression of the importance of this phenomenon in particular sectors.

The case of plywood is an interesting exception to the second generalization and suggests there was a purposive mechanism for establishing export incentives. Plywood exports were forty-three times the volume of sales on the protected domestic market—and thus could not be subsidized through protection to domestic sales. The only way of subsidizing plywood exporters was to allow them to sell some of their imported inputs to wood processing industries that produced for the domestic market. In fact, plywood had both the lowest rate of nominal input protection and almost the highest rate of effective protection of any commodity exported, owing to the wastage allowance subsidy on imported roundwood.

Estimates of Net Incentive Rates

The measures of incentives presented and discussed so far are gross estimates; that is, no adjustment has been made for the overvaluation of the Korean won. Such an adjustment is necessary since actual exchange rates are affected by protective measures against imports and by export incentives.

ESTIMATION OF THE FREE-TRADE EXCHANGE RATE. The degree of overvaluation is the percentage difference between the prevailing market exchange rate and the "free-trade" exchange rate, which would leave the balance of trade unchanged if protective measures and export incentives were removed. To calculate the free-trade exchange rate it is necessary to estimate the elasticities of supply of foreign exchange earned by exports and of demand for imports with respect to the exchange rate. We assume that imports are supplied at constant costs so that their supply elasticity is infinite.

Our regression analysis indicates that the demand elasticity for consumer goods imports in Korea falls between 1.0 and 2.5.[68] The demand elasticities for intermediate and capital goods imports are much lower: The former range between 0.3 and 0.6; the latter between 0.1 and 0.4. Estimates of the demand elasticity for total imports obtained by weighting the individual elasticities range from 0.3 to 0.7. These estimates are taken from time-series regressions of imports (in constant prices) against an appropriate national income accounts aggregate and the real effective exchange rate on imports. They require an upward adjustment for the effects of import restrictions. On the average over the sample period, about 70 percent of actual imports were of commodities subject to either quantitative controls or

Table 8.12. *Korea: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1968*
(percent)

Industry Group	Nominal Protection				Effective Protection				Effective Subsidy			
	Tariff		Nominal		Balassa			Corden	Balassa			Corden
	D	A	D	A	E	D	A	A	E	D	A	A
Agriculture, Forestry & Fishing (I)	25	25	7	7	-23	8	8	8	-18	12	11	11
Mining & Energy (IV)	3	0	0	-2	-10	-6	-7	-6	-7	-5	-5	-5
Primary Activities (I+IV)	24	23	7	6	-16	8	7	7	-11	11	10	10
Processed Foods (II)	48	44	-6	-6	-13	-27	-26	-21	-8	-33	-31	-25
Beverages & Tobacco (III)	121	116	-6	-6	-11	-27	-27	-22	4	-33	-32	-26
Construction Materials (V)	21	19	-5	-5	-15	-21	-21	-16	-6	-26	-25	-19
Intermediate Products I (VIA)	25	20	-6	-6	14	-34	-29	-21	24	-37	-31	-23
Intermediate Products II (VIB)	45	41	11	9	-12	11	9	6	3	5	5	3
Nondurable Consumer Goods (VII)	76	54	2	-1	-12	-20	-18	-14	-6	-29	-24	-19
Consumer Durables (VIII)	82	63	27	20	-17	43	32	21	-10	20	15	9
Machinery (IX)	40	37	19	17	-30	27	25	17	-16	16	15	10
Transport Equipment (X)	49	48	42	41	-144 a/	123	123	67	-95 a/	119	119	65
Manufacturing (II, III, V-X)	54	45	3	1	-9	-12	-12	-9	0	-19	-17	-13
Manufacturing, less Beverages & Tobacco (II, V-X)	47	39	4	2	-9	-11	-11	-8	0	-17	-15	-11
All Industries, less Beverages & Tobacco (I, II, IV-X)	37	33	5	4	-10	1	0	0	-3	1	1	0
All Industries (I-X)	41	37	4	3	-10	0	-1	-1	-3	-1	-1	-1

Note: Because of rounding, zero denotes any value greater than or equal to -0.5 and less than 0.5.

a/ Estimated value added in exports at exporters' producer prices and at world prices are both negative; the algebraic sign of the effective incentive rate has thus been reversed from that given by the conventional formula.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Tables 5.A and 5.B.

to prohibitive tariffs. If we assume that the restricted imports were not responsive to modest changes in the exchange rate, the estimated elasticity is the weighted average of a zero elasticity on about 70 percent of imports and an unknown elasticity on the remainder.[69] It is the latter elasticity that we require, since the move to free trade would mean abandoning import restrictions and prohibitive tariffs. Adjusted import demand elasticity estimates range from 1.1 to 2.7.

Multicollinearity makes it impossible to obtain robust estimates of the supply elasticity of foreign exchange. The best estimates appear to come from time-series regressions of total commodity exports against GNP and the gross real effective exchange rate for exports. Estimates range from 2.0 to 7.0, the most plausible estimate being 4.5, the midpoint of the range. Again, an adjustment is required to take account of quantitative restrictions on exports from Korea. From the mid-1960s onward, Korea's exports of ginseng, seaweed, textile yarns and fabrics, clothing, plywood, and wigs, which accounted for about 45 percent of its total exports, faced gradually increasing market restrictions abroad. An appropriate weighted average elasticity for these exports is approximately 2.25, which is half the estimate for the period when restrictions were unimportant. The weighted average of the elasticities for restricted and unrestricted exports is thus 3.5.

Estimates of average nominal protection on domestic sales and the average subsidy rate on exports are also required. The former, taken from Table 8.7, equals 14 percent. The latter may be derived as the difference between total producer- and world-price value added (Balassa convention) in exports divided by the value of exports. This figure, excluding direct tax and credit subsidies, is 0.1 percent.

The derived estimates of the degree of overvaluation range from 6.1 to 9.1 percent.[70] The preferred estimate is the latter, which results from accepting the high estimate of the demand elasticity for imports. A higher export elasticity or a lower import elasticity would yield a lower estimate of the free-trade exchange rate.

THE STRUCTURE OF NET INCENTIVES. Tables 8.12 and 8.13 present estimates of net effective incentive rates for the ten industry groups and four trade categories. It has been shown that adjustment for overvaluation may affect the ranking of sectors according to effective incentive rates under the Balassa (but not the Corden) method of treating value added in the sectors producing nontradeables.[71] In this case, however, the rankings are virtually unaffected. For example, the rank correlation between net and gross effective subsidy rates on total sales is 0.99.

The weighted average of net effective subsidy rates across all sectors and markets was −0.7 percent, and 90 out of the 150 sectors had negative rates on their total sales. Agriculture, which benefited from protection in the domestic market and paid no direct taxes, had a net effective subsidy rate on total sales of 11 percent and thus received a positive incentive even when allowance is made for the overvaluation of the won. With rates of −5.1 and −17 percent, respectively, mining and energy and manufacturing were discriminated against in absolute terms, since value added in these industries would have been higher on the average had there been free trade with no import restrictions, tariffs, or direct tax and credit preferences.

Net effective subsidy rates on total sales indicate static comparative efficiency if there are no factor price distortions across sectors and if the market prices of factors are close to their shadow values. The net effective subsidy measure takes account of direct tax and credit preferences, but there is little indication of other distortions in factor markets. Indeed, most observers would argue that market factor prices have been close to shadow values, or efficiency prices, in Korea.[72] Particularly important to their argument is the fact that labor markets have been free and relatively undistorted. Labor organizations cover only a small fraction of the labor force and are barred from using strikes and other instruments of collective bargaining. Neither is there effective minimum wage legislation.[73]

Our own conclusion is that Korea's net effective subsidy rates on total sales do reflect static comparative efficiency in most cases. Our principal qualifications are concerned less with possible differences between market and shadow factor prices than with possible errors of measurement and aggregation. Moreover, since they pertain to only a single year, our estimates for some sectors may also unduly reflect the peculiar circumstances of one point in time.

The relatively high net effective subsidy rate for agriculture is consistent with the judgment of most observers that Korea lacks a comparative advantage in its major food crops. Korea's real agricultural output has grown at the comparatively rapid rate of about 4 percent over the past twenty years. To achieve faster growth would require massive investment in land improvement, irrigation, and mechanization.[74] Korea's lack of comparative advantage in grain production is explained by its limited and rather poor arable land base and adverse climatic conditions, which preclude the double cropping of rice. In those parts of the country where double cropping is practiced, the winter crop is typically barley and the summer crop rice. As for the mining sector, Korea's modest comparative advantage in some minerals is disappearing as the higher grade ore bodies are being exhausted.

Table 8.13. *Korea: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1968*
(percent)

Trade Category	Nominal Protection				Effective Protection				Effective Subsidy			
	Tariff		Nominal		Balassa			Corden	Balassa			Corden
	D	A	D	A	E	D	A	A	E	D	A	A
Export Industries	67	39	-1	-4	-10	-26	-20	-16	-3	-34	-22	-18
Primary	-3	-7	-12	-15	-21	-22	-21	-19	-17	-29	-20	-19
Manufacturing	68	41	-1	-4	-7	-27	-20	-16	1	-34	-23	-18
Export-&-Import-Competing Industries	58	32	25	12	-14	47	24	16	-5	33	18	13
Primary	-7	-7	4	-1	-11	2	-5	-4	-7	5	-1	-1
Manufacturing	61	34	26	13	-14	51	27	18	-5	35	21	14
Import-Competing Industries	36	35	24	24	-22	59	59	43	10	62	62	46
Primary	13	13	34	34	-9	54	54	53	-4	61	61	59
Manufacturing	43	42	21	21	-24	65	64	38	12	64	63	37
Non-Import-Competing Industries	38	37	0	0	-10	-5	-5	-5	-3	-5	-5	-5
Primary	25	25	4	4	-9	3	3	3	-1	7	7	6
Manufacturing	52	50	-4	-4	-11	-25	-25	-20	-5	-32	-32	-25
All Industries	41	37	4	3	-10	0	-1	-1	-3	-1	-1	-1
Primary	24	23	7	6	-16	8	7	7	-11	11	10	10
Manufacturing	54	45	3	1	-9	-12	-12	-9	0	-19	-17	-13

Note: Because of rounding, zero denotes any value greater than or equal to -0.5 and less than 0.5.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Tables 6.A and 6.B.

Within manufacturing, Korea's static comparative advantage appears to lie in beverages and tobacco, processed foods, low level intermediate products, construction materials, and nondurable consumer goods, all of which had average net effective subsidy rates between −32 and −23 percent. Export and non-import-competing sectors predominate in these industrial groups, whereas import-competing sectors predominate in the remaining manufacturing groups in which the domestic resource cost of producing a dollar's worth of value added (at world prices) exceeded the free-trade exchange rate. Korea's comparative disadvantage is apparently greatest in transport equipment, which had a net effective subsidy rate of 119 percent.

The average domestic resource cost of a dollar in the export industries was 22 percent less than the free-trade exchange rate. Primary export commodities, chiefly minerals, and manufactured export commodities appear to have been produced with equal comparative efficiency. Viewed from a static perspective, the domestic resource cost of import substitution in import-competing products was quite high, at an average of more than 60 percent above the free-trade exchange rate. But the domestic resource cost was less than the free-trade exchange rate in a number of import-competing commodities, including various types of machinery, glass products, paper and paperboard, and metal construction products, while it was only slightly higher for pulp, dairy products, and other chemical products. Moreover, Korea's comparative disadvantage appears to be substantially less in those import-competing industries that also export.

Most of Korea's non-import-competing primary products are agricultural goods in which the country appears to have a comparative disadvantage. Manufactured non-import-competing products, however, appear on the average to have been produced with even greater comparative efficiency than all exports. Among the non-import-competing products, Korea's static comparative advantage appears to be quite strong in cotton yarn, wood products, printing and publishing, leather shoes, tires and tubes, drugs, clay and concrete products, and synthetic resin products. As might be expected, Korea's exports of the products listed have grown substantially since 1968.

Exports were on balance slightly discriminated against in absolute terms, for the net effective subsidy rate on total exports was −3.1 percent. Primary exports received a substantial negative net effective subsidy: The subsidies they received were relatively unimportant, and they were further discriminated against by currency overvaluation. For manufactured exports, by contrast, subsidies were on the average just sufficient to offset the overvaluation of the won, so that the net effective subsidy rate was almost nil. In manufacturing as a whole, exports were favored over domestic sales, while the opposite was true for primary production. In general, net incentives were biased toward exports only if the domestic resource cost of production was less than the free-trade exchange rate. The bias was generally caused not by explicit export subsidies but by low incentives to domestic sales.

The relative incentive to exports in which Korea has a static comparative advantage may thus be traced to the low degree of currency overvaluation.[75] Had these products received higher nominal protection on the domestic market, or had the won been more highly overvalued, their exports would have benefited rather less from the incentive system unless explicit export subsidies had been increased. Explicit export subsidies in the form of wastage allowances and direct tax and credit preferences were important only for products in which Korea does not appear to have a static comparative advantage. Although they often resulted in an absolute export incentive, incentives generally remained biased toward domestic sales, since the latter received high nominal protection. Because of the institutional features of the Korean incentive policy system, however, high incentives to domestic sales must in many cases be regarded, at least in part, as an incentive to exports.

Trade Policy and Structural Change

The objective of this study is not merely to describe the Korean incentive system but to assess its impact on the direction and efficiency of resource allocation. In analyzing the structural changes that have accompanied Korea's development, we carry the study forward to 1975.

The first steps are to review the salient features of Korea's export performance, which has been remarkable not simply because of the rapidity of its growth but also because of the diversification of exports, by composition and destination, and to assess the unique factors that may explain the rapid growth. Next the relationship between the expansion of trade and industrial growth is examined, together with the contributions that export expansion and import substitution have made to Korea's industrial development. Evidence is presented on the relative factor intensities of exports and imports and the rapid increase over time in the intensity of factor use; it indicates that the allocation of resources resulting from Korea's export-led strategy has been generally efficient. The section concludes with an analysis of the relationship between incentives and the observed structural changes.

Table 8.14. *Korea: Exports of Goods and Services, 1960–75*

Item	1960	1965	1970	1975
	Thousand Million Won; Current Prices			
Exports of Goods and Nonfactor Services	8.2	68.6	381.2	2,730.3
Gross Factor Income from Rest of World	1.9	8.3	47.1	99.2
	Percentage Shares in Exports of Goods and Nonfactor Services; Current Prices			
Merchandise	44.0	69.7	75.2	90.5
Primary Products	38.0	27.3	17.0	16.7
Manufactured Products	6.0	42.4	58.2	73.8
Services	56.0	30.3	24.8	9.5
	Million Dollars; Current Prices			
Foreign Exchange Receipts from Current Transactions	111.8	298.0	1,306.7	5,909.7
	Percentage Shares in Foreign Exchange Receipts from Current Transactions; Current Prices			
Visible Exports	29.0	57.8	62.4	83.2
Invisible Exports	71.0	42.2	37.6	16.8
Receipts from Government Transactions a/	56.3	25.3	20.0	2.7
Military Procurement b/	36.9	13.4	10.6	n.a.
Won Sales to U.N. Military Personnel	19.1	11.5	4.0	n.a.

n.a. Not available.

Note: There are differences in statistical sources, coverage, and the times at which various transactions are recorded, between the national income and foreign exchange settlements data; also, the former are in domestic currency values while the latter are in U.S. dollar values. Thus, at the official exchange rate, merchandise exports do not exactly correspond in current prices to visible exports, nor does the sum of nonfactor service exports plus factor income from abroad equal invisible exports. Figures may not reconcile because of rounding.

a/ Includes nonmilitary transactions as well as military procurement and won sales to U.N. military personnel.

b/ Includes U.S. offshore procurement related to the Vietnam War; also includes sales of electricity, water, and transport and communication services to the U.N. military command.

Sources: Exports, gross factor income, and the percentage shares of merchandise and services in exports are based on national income accounting data found in Bank of Korea, National Income in Korea, 1975 and in Bank of Korea, Economic Statistics Yearbook, 1976. Other data are based on foreign exchange settlements data found in various issues of Bank of Korea, Economic Statistics Yearbook.

Export Composition

As shown in Table 8.14, more than half of Korea's foreign exchange receipts from current transactions in 1960 were earned on government transactions, of which military procurement was the single largest item. Military procurement consisted largely of services, of which construction was particularly important. Sales of won (for personal use) to resident U.N. military personnel are also classified under government transactions and make up the second largest item under this heading. Merchandise exports, which accounted for only 44 percent of total exports in 1960, were dominated by primary products.

By 1975 government transactions were the source of less than 3 percent of foreign exchange earnings. The share of merchandise in total exports had reached 91 percent, while that of manufactured products had grown to 74 percent. Although foreign exchange earnings in current dollars had expanded more than 50 times over these fifteen years, manufactured exports had expanded over 900 times, a rate of growth averaging more than 55 percent a year. Admittedly, the growth of manufactured exports started from a very small base, but it continued at a rapid pace after manufactured exports had reached a substantial percentage of output. Thus exports accounted for more than 25 percent of the increase in manufactured output between 1970 and 1975, whereas the share of exports in manufacturing output in 1970 had been only 13 percent.

The increasing diversification of Korea's merchandise exports over time may be seen in Table 8.15, while the following discussion is based on somewhat more detailed figures. The most important items in Korea's merchandise exports in 1960 were primary products, including (in order of their importance) metallic ores, rice, crude animal and vegetable materials, fish, and dried seaweed. Woven cotton fabrics constituted more than half of exported manufactures, which in turn accounted for less than 14 percent of total commodity exports. The share of manufactures had reached slightly more than 50 percent of total commodity exports by 1965. Clothing, plywood, woven cotton fabrics, and plates and sheets of iron and steel each accounted for more than 5 percent of commodity exports in that year. By 1970, clothing had grown to more than 25 percent of Korea's exports of goods; plywood and textile fabrics each made up more than 10 percent, and electronics products were approaching 5 percent. The ability of Korean entrepreneurs to respond to world market trends is exemplified in the rapid rise of wig exports from nil in 1960 to about 12 percent of commodity exports in 1970. These exports declined in importance, falling to 1.5 percent of exports in 1975, when the spotlight of fashion turned away from wigs and false eyelashes and new Korean exports developed.

Korea's exports in 1975 were well diversified in comparison with those of other developing economies. Exports exceeded US$100 million for each of the following items in that year (listed in order of importance): woven textile fabrics (of which cotton fabrics were less than 10 percent), electrical machinery and appliances (including electronic products), miscellaneous manufactures, fish, plates and sheets of iron and steel, veneer sheets and plywood, footwear, transport equipment (largely shipbuilding, plus rolling stock), clothing, manufactures of metal, and nonmetallic mineral manufactures. Together, exports of primary products in SITC categories 0 through 3, which had represented more than 80 percent of merchandise exports in 1960, accounted for only 18 percent of total exports. Nonetheless, the value of primary exports had increased from US$30 million in 1960 to US$925 million in 1975.

As shown in Table 8.16, the destinations of Korea's exports broadened as manufactured exports grew. Japan's share fell from nearly two-thirds in 1960 to one-fourth in 1975, while the share of the United States rose from nearly 7 percent in 1960 to almost 50 percent in 1970 before falling to 30 percent in 1975. Korea's exports to Europe and the rest of the world increased faster than the overall total; those to the Middle East rose particularly fast after 1973.

Possible Explanations of Export Growth

The decline in the combined shares of the United States and Japan from 70 percent in 1960 to 56 percent in 1975 (Table 8.16) belies the tendency among those unfamiliar with its details to ascribe Korea's success as an exporter to its special relationship with the United States and Japan. Nonetheless, Korea's relationship with the United States obviously increased its foreign exchange earnings through expenditures stemming from the stationing of U.N. forces in Korea and, during the war in Vietnam, from offshore procurement by the United States. But military-related expenditures contributed a steadily falling share of total export earnings, reaching less than 3 percent by 1975.[76] Furthermore, the merchandise component of these expenditures has always been well below half the total.

With the exception just noted, neither the United States nor Japan has granted Korean exporters preferences unavailable to exporters in other developing countries. Korean exporters may have benefited from more subtle forms of preferential treatment—for example, in the allocation of import quotas on textiles by the United States—but it is not known whether this is so. (Korea's rapid diversification away from textile exports reduces

Table 8.15. *Korea: Composition of Merchandise Exports, 1960–75*
(million current U.S. dollars)

SITC Category	1960		1965		1970		1975	
	Value	Percent	Value	Percent	Value	Percent	Value	Percent
Food and Live Animals (0)	9.7	29.6	28.2	16.1	65.6	7.9	602.3	11.9
Beverages and Tobacco (1)	0.5	1.5	0.9	0.5	14.2	1.7	67.6	1.3
Inedible Crude Materials (2)	15.8	48.2	37.0	21.1	100.0	12.0	150.5	3.0
Mineral Fuels (3)	1.1	3.3	1.9	1.1	8.7	1.0	104.5	2.1
Animal and Vegetable Oils and Fats (4)	0.2	0.6	0.1	0.1	0.1	0.0	0.9	0.0
Chemicals (5)	0.4	1.2	0.4	0.2	11.4	1.4	74.8	1.5
Manufactured Goods by Material (6)	3.9	11.9	66.4	37.9	220.9	26.4	1,484.6	29.2
Wood and Cork Products (63)	-	-	18.2	10.4	93.5	11.2	227.6	4.5
Textile (65)	-	-	10.5	6.0	84.9	10.2	648.9	12.8
Nonmetallic Mineral Manufactures (66)	-	-	2.8	1.6	6.5	0.8	106.8	2.1
Iron and Steel (67)	-	-	12.7	7.3	13.4	1.6	231.5	4.6
Manufactures of Metal (69)	-	-	2.2	1.3	12.2	1.5	124.1	2.4
Machinery and Transport Equipment (7)	0.1	0.3	5.5	3.1	61.5	7.4	702.1	13.8
Electrical Machinery and Appliances (72)	-	-	1.9	1.1	43.9	5.3	441.6	8.7
Transport Equipment (73)	-	-	1.1	0.6	9.2	1.1	183.7	3.6
Miscellaneous Manufactured Articles (8)	0.1	0.3	34.5	19.7	352.5	42.2	1,882.6	37.1
Clothing (84)	-	-	20.7	11.8	213.6	25.6	1,148.2	22.6
Footwear (85)	-	-	4.1	2.3	17.3	2.1	191.2	3.8
Miscellaneous (89)	-	-	8.9	5.1	114.1	13.7	383.6	7.5
Human Hair and Wigs (89995)	-	-	6.8	3.9	101.1	12.1	75.3	1.5
Unclassified (9)	1.0	3.0	0.2	0.1	0.4	0.0	11.1	0.2
Total	32.8	100.0	175.1	100.0	835.2	100.0	5,081.0	100.0

- Value less than 0.05.

Note: The figures shown here are based on customs clearance data and thus exclude exports not cleared through customs, such as sales of goods to military forces overseas and offshore sales of fish. Totals may not reconcile because of rounding. Numbers in parentheses are SITC codes.

Source: Bank of Korea, Economic Statistics Yearbook, various issues.

Table 8.16. *Korea: Destination of Merchandise Exports, 1960–75*
(million current U.S. dollars)

Destination	1960		1965		1970		1975	
	Value	Percent	Value	Percent	Value	Percent	Value	Percent
United States	2.2	6.7	61.6	35.2	395.0	47.3	1,536.3	30.2
Japan	20.8	63.4	43.9	25.1	233.9	28.0	1,292.9	25.4
Europe	4.6	14.1	21.4	12.2	76.0	9.1	936.7	18.4
Other Asia	3.8	11.6	41.8	23.9	81.8	9.8	760.0	14.9
Rest of World	1.4	4.3	6.3	3.6	47.6	5.7	555.2	10.9
Total	32.8	100.0	175.1	100.0	835.2	100.0	5,081.0	100.0

Note: These figures are based on customs clearance data and thus exclude exports not cleared through customs, such as sales of goods to military forces overseas and offshore sales of fish. Totals may not reconcile because of rounding.

Source: Bank of Korea, Economic Statistics Yearbook, various issues.

the relevance of this particular possibility in explaining the growth of its exports.)

It has also been suggested that Korea's exports have benefited from commercial relations (for example, direct foreign investment and subcontracting) fostered by its close ties to the United States and Japan. Korea has relied extensively on foreign savings to finance investment,[77] but most of the private capital inflow has been in the form of commercial loans, a varying but substantial share of which have been short-term credits of one to three years' maturity.[78]

Between 1966 and 1971 direct foreign investment averaged less than 4 percent of total foreign capital inflows. *Cumulative* direct foreign investment in Korea prior to 1970 was appreciably less than US$100 million in current prices. If it is assumed that all this investment went into the manufacturing sector and if this figure is combined with the capital stock data given in Table 8.24 below, no more than 5 percent of the capital stock in manufacturing in 1970 appears to have been financed by direct foreign investment. In turn, Cohen estimates that foreign firms (that is, those with any foreign equity participation) were responsible for only a small fraction of Korea's exports: 11 percent in 1970 and 14 percent in 1971.[79]

The situation has changed somewhat since 1971, in that the share of direct foreign investment in total foreign capital inflows rose to an average of nearly 20 percent in the following years. This was largely due to the Japanese investment permitted by the relaxation of the Japanese government's control over outflows of foreign capital, stimulated by changing circumstances in the Japanese economy. Korea's cumulative direct foreign capital inflow from 1970 to 1975 was approximately US$700 million, or about 17 percent of total manufacturing investment over this period.[80] In 1975, according to information from the Economic Planning Board, foreign firms were responsible for about 18 percent of total commodity exports.

It was not until 1970 that Korea first established a free-trade zone explicitly designed to attract direct foreign participation in exports. Up to mid-1973 exports from firms located in this zone cumulated to only US$20 million.[81] More than two thirds of these exports came from electrical machinery and appliance producers, most of whom were engaged in the offshore assembly of electronics. Electronics exports were atypical in having been dominated by foreign firms from the start.[82] In 1972, for example, wholly owned foreign subsidiaries accounted for 34 percent of total electronics production in Korea and 54 percent of the industry's exports; the respective figures for joint ventures were 20 and 18 percent.[83]

There has been little research into the marketing channels employed or the entrepreneurial activity involved in developing Korea's exports.[84] Thus, for exam-

ple, one cannot judge to what degree the initial growth of Korea's exports depended upon international subcontracting arrangements not linked to direct foreign investment. Nor can one do more than speculate whether Koreans derived unique benefits from their extensive contact with foreigners during and after the Korean War. In some cases this seems likely. The current success of Korean construction firms in winning major construction contracts in the Middle East, for example, is explained at least in part by the experience they gained under earlier contracts for military procurement in both Korea and Vietnam. But such factors should not detract from what is evident to anyone who has come into contact with Korean exporters: They are both enterprising and successful in seeking and exploiting opportunities for profitable export. In this respect, one certainly cannot explain Korea's success as an exporter of manufactures without reference to the efforts of its entrepreneurs or to the incentive policies under which they operate.

The Changing Structure of Production and Trade

To examine how the changing magnitude and composition of trade has affected Korea's industrialization, we employ input-output analysis. Our investigation was completed before the input-output tables for 1970 and 1973 were published and thus is confined to the period from 1955 to 1968. However, summary figures are presented for the contributions of export expansion and import substitution to growth that occurred through 1973.

THE INPUT-OUTPUT DATA BASE. Five input-output tables spanning 1955–68 are available for Korea. The table for 1955 was prepared especially for this study and gives information for 29 sectors. Those for the remaining years—1960, 1963, 1966, and 1968—provide information in a breakdown by 117 sectors, of which 80 produced manufactures, 12 produced primary commodities, and the remainder services.[85] Because of the different levels of detail, it is not possible to present the same information for all five years. In particular, aggregate statistics by industrial group and by trade category could not be tabulated for 1955.

A study of structural change is most meaningfully conducted in terms of real value magnitudes; thus the current price input-output statistics were converted to constant 1965 prices. A procedure often followed in other studies of this type is to convert all magnitudes for a given year by means of the same index, say the GDP deflator. Although this procedure ensures that, on the average, changes over time are not misstated because of price level changes, it fails to take account of changes in relative prices. Accompanying the pronounced shift in the structure of monetary magnitudes in Korea was an equally marked change in the relative price structure.

To capture relative price changes, the current price statistics were deflated on the basis of a set of output deflators at the 117-sector level, along with independent time series on the general wholesale price level, the wholesale price level of imported products, the price level of exports, and the relevant effective exchange rates on imports and exports. The resulting figures at constant domestic market prices incorporate—as far as possible, given the limitations of the price indexes—changes over time both in the average price level and in the structure of relative prices.[86]

Table 8.17 shows how deflation to constant prices affects the shares of exports in total production and imports in total domestic supply. Measurement in current domestic prices yields lower trade shares than those observed in constant 1965 prices because the prices of imports and exports relative to the domestic price level were higher in 1965 than in any of the observation years. In this respect, the structure of prices was particularly distorted in 1955 as a result of the high degree of currency overvaluation in the mid-1950s. Further deflation to constant world prices, to adjust for nominal protection on domestic sales and tariffs on imports, raises the share of exports in output; its effect on the share of imports in demand depends upon which is higher on the average—nominal protection on domestic sales or actual tariff rates on imports.[87]

At constant world prices, the compound annual growth rates between 1955 and 1968 of primary, manufactured, and total commodity output were 5.5, 14.0, and 9.8 percent, respectively. Because these growth rates are almost identical to those obtained from data in constant domestic prices, Korea's high growth rate as conventionally measured cannot be a statistical aberration explained by very high protection to the most rapidly growing sectors.[88] Moreover, since nominal and effective protection for primary activity has exceeded that for manufacturing, valuation in world prices increases (though only slightly) the relative contribution of manufacturing to overall growth.[89]

DOMESTIC DEMAND, PRODUCTION, AND TRADE. To examine how the structure of commodity production and trade changed from 1960 to 1968,[90] we must look at data on the composition of domestic demand and production, and imports and exports, by industry groups and trade categories (Table 8.18). Total domestic demand exceeded total domestic production throughout the period, and thus, for a particular sector, equal shares in both imply net imports of the corresponding product group.

Table 8.17. *Korea: Effect of Deflation on Merchandise Trade Shares*
(percent)

Trade Share and Prices	1955	1960	1963	1966	1968
Share of Exports in Total Output					
Current Domestic Prices	0.7	2.8	2.7	6.3	7.5
Constant Domestic Prices	1.0	3.0	2.9	6.6	7.9
Constant World Prices	1.0	3.2	3.1	6.9	8.3
Share of Imports in Domestic Demand					
Current Domestic Prices	11.3	15.5	15.0	16.2	20.1
Constant Domestic Prices	19.0	17.0	17.4	17.1	21.7
Constant World Prices	18.0	15.9	16.7	16.4	20.5

Note: Services are excluded from the calculation. The data also exclude scrap and unclassifiables.

Source: Authors' estimates; see Larry E. Westphal and Kyu Soo Kim, "The KDI Input-Output Data Bank" (Seoul: Korea Development Institute, 1977; processed), Annex 5.

The share of primary production in total output of goods fell from 50 to 35 percent during 1960–68, while imports of primary products rose more rapidly than did exports; thus net trade in these products moved increasingly toward imports. The share of manufacturing in total production of goods rose by almost 30 percent, the direction of net trade in manufacturing products being toward imports throughout, although that was less the case toward the end of the period.

The share of export products in domestic demand fell between 1960 and 1968, but their share in production rose. Nondurable consumer goods, which made up more than one third of merchandise exports in 1968, followed the same pattern. Import-competing manufactures experienced the most rapid growth in both domestic demand and production. Non-import-competing commodities maintained the largest share of both domestic demand and production throughout the period, while the demand and output shares of manufactured export-and-import-competing (XIC) commodities rose somewhat.

The trends in shares by trade category reflect several influences: first, the falling share of primary demand and output and the fact that most primary goods have been classified in the non-import-competing category; second, the increasing openness of the Korean economy; and third, the classification of commodities (and therefore sectors) according to their status in 1968. With respect to the latter, one would normally expect the shares in production and demand of commodities that competed with imports in 1968 to have been smaller in 1960, since most of these are products for which significant demand emerged only toward the end of the period and in which import substitution had not progressed very far. This is certainly the case for manufactured import-competing commodities, the only group to increase its share of either demand or production *within total manufacturing*. Nonetheless, domestic production did not keep up with the growth of demand, so that an increasing share of these products had to be imported.

Given the dynamics of the product cycle in exports, one would also expect exports that were important in 1968 to have been relatively less important in the past, certainly as a component of total exports. The data confirm this. Even so, it is somewhat surprising to observe the pronounced increase in the production share of manufactured export commodities in the face of the equally pronounced fall in their demand share. The difference reflects just how rapidly Korean exports grew from 1960 to 1968.

With the exception of the primary sectors[91] and transport equipment, between 1960 and 1968 the ratio of exports to production rose in every industrial group. Overall, the share of exports in manufactured output increased more than four times. By trade category, as would be expected, the proportion of production ex-

Table 8.18. *Korea: Structure of Commodity Production and Trade, by Industry Group and Trade Category, 1960 and 1968*
(percent)

Industry Group or Trade Category	Production Growth Rate, 1960-68	Composition								Trade Shares			
		Production		Domestic Demand		Exports		Imports		Exports in Production		Imports in Domestic Demand	
		1960	1968	1960	1968	1960	1968	1960	1968	1960	1968	1960	1968
Agriculture, Forestry, & Fishing (I)	7.9	46.8	32.8	43.1	31.5	32.9	4.5	21.4	16.3	2.2	1.1	7.9	10.6
Mining & Energy (IV)	10.7	2.7	2.4	1.8	1.8	25.5	6.2	1.0	1.1	29.1	21.7	8.3	11.8
Primary Activities (I + IV)	8.1	49.5	35.2	44.9	33.3	58.4	10.7	22.4	17.4	3.7	2.5	7.9	10.7
Processed Foods (II)	11.6	12.5	11.4	12.0	10.1	10.4	7.7	9.4	3.8	2.6	5.6	12.4	7.8
Beverages & Tobacco (III)	13.4	6.1	6.4	5.4	5.4	2.2	2.3	1.1	0.0	1.1	2.9	3.1	0.2
Construction Materials (V)	26.4	0.9	2.2	0.8	1.9	0.9	1.4	0.4	0.4	3.1	5.2	8.5	4.1
Intermediate Products I (VIA)	20.4	8.9	15.0	10.2	14.5	4.9	24.6	16.1	16.1	1.7	13.6	25.2	22.6
Intermediate Products II (VIB)	14.8	11.9	13.6	14.3	15.8	12.5	13.2	27.3	24.3	3.3	8.1	30.4	31.5
Nondurable Consumer Goods (VII)	17.1	8.0	10.8	9.0	7.4	7.3	34.9	13.8	2.7	2.8	26.8	24.5	7.6
Consumer Durables (VIII)	27.1	0.5	1.4	0.8	1.7	0.1	3.3	2.2	3.7	0.6	19.9	43.4	44.2
Machinery (IX)	20.6	1.0	1.7	1.8	5.6	1.7	1.5	6.4	20.8	5.3	7.4	55.5	75.7
Transport Equipment (X)	33.0	0.6	2.4	0.6	4.2	1.7	0.3	0.8	10.7	8.6	1.1	20.6	51.7
Manufacturing (II, III, IV-X)	16.4	50.5	64.8	55.0	66.7	41.6	89.3	77.6	82.6	2.6	11.4	22.4	25.3
Export Industries	15.3	12.9	15.3	10.9	8.5	46.8	72.9	5.9	2.1	11.4	39.4	8.6	5.1
Primary	7.4	1.0	0.6	0.2	0.2	24.3	6.1	0.1	0.2	79.3	77.8	10.6	24.8
Manufacturing	15.8	12.0	14.7	10.7	8.3	22.5	66.8	5.7	1.9	5.9	37.7	8.6	4.7
Export-&-Import-Competing Industries	14.4	2.9	3.2	3.3	4.0	4.0	12.7	6.0	10.2	4.3	32.5	28.3	52.6
Primary	10.9	0.3	0.2	0.2	0.2	1.8	0.6	0.0	0.3	19.5	20.7	2.5	23.1
Manufacturing	14.7	2.6	3.0	3.1	3.7	2.2	12.0	5.9	10.0	2.7	33.5	30.0	54.4
Import-Competing Industries	14.5	15.3	17.2	19.8	27.7	15.1	2.8	43.8	63.6	3.1	1.4	35.1	46.9
Primary	4.4	8.4	4.5	7.4	4.4	7.9	0.1	2.0	2.5	3.0	0.2	4.3	11.6
Manufacturing	21.7	6.9	12.7	12.5	23.3	7.2	2.8	41.8	61.1	3.3	1.8	53.3	53.6
Non-Import-Competing Industries	11.9	68.9	64.2	65.9	59.8	34.1	11.6	44.3	24.0	1.6	1.5	10.7	8.2
Primary	8.8	39.9	29.8	37.2	28.5	24.4	3.9	20.3	14.4	1.9	1.1	8.7	10.4
Manufacturing	15.3	29.0	34.5	28.7	31.3	9.7	7.6	24.1	9.6	1.1	1.8	13.3	6.3
All Industries	12.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	3.2	8.3	15.9	20.5

Note: The underlying data are in constant world prices and exclude scrap and unclassifiables. Totals may not reconcile because of rounding.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Tables K, L, and M.

ported rose most rapidly in manufactured export and XIC commodities. Most of the manufactured items classified as export or XIC commodities in 1968 would have been classified either as import- or non-import-competing only eight years earlier. The sectors with the highest export shares in 1968 were consumer goods and low-level intermediate goods.

The share of imports in aggregate domestic demand increased from 1960 to 1968, and the highest import shares in 1968 appeared in the sectors producing investment goods, consumer durables, and intermediate goods (Table 8.18). Most of the rise in the aggregate import share can be traced to primary products and to investment goods. Imports of primary commodities grew in relative importance over the period since agricultural output, though rising reasonably fast, failed to keep pace with the very rapid growth of disposable income that was fueled by the growth of industry. In turn, the rapid growth of investment, coupled with policies that discriminated against domestic capital goods producers (see the section "Summary and Evaluation"), caused imports of investment goods to increase far more quickly than their domestic production. The import share for import-competing manufactures remained fairly stable at about 54 percent, while that for non-import-competing manufactures fell. Among manufactures classified by trade category, the only significant rise in the share of imports in domestic demand occurred in the XIC category.

The structure of exports and imports also changed substantially. Manufactures accounted for 89 percent of total merchandise exports in 1968, compared with only 42 percent in 1960. The growth of manufactured exports was led by low-level intermediate products and nondurable consumer goods, and construction materials and consumer durables also grew more rapidly than the total.

Trade clearly made an important contribution to Korea's development. A substantial part of the growth of many sectors appears to have been due to the expansion of exports, and there is evidence of import substitution in several sectors. The changing composition of trade along with its rising share in aggregate economic activity permitted the exploitation of Korea's comparative advantage and accommodation to the fast growth of investment demand. The rapid expansion of manufactured exports helped to finance the rising share of imports in GNP which, along with the foreign exchange savings from import substitution in the production of several commodities, allowed imports of primary products, intermediate goods, consumer durables, and investment goods to increase very rapidly in absolute terms. Trade thus permitted the structure of output to shift more in the direction of manufactures, away from primary production, than did the structure of domestic demand, while within manufacturing, trade allowed the structure of domestic demand to change more rapidly than that of production.[92]

SOURCES OF TOTAL OUTPUT GROWTH. In examining the role of trade in Korea's development, it is instructive to decompose the growth of total output between 1955 and 1968 into three parts related to the growth of domestic demand, the growth of exports, and import substitution. Even within the simple accounting approach developed by Chenery, Shishido, and Watanabe,[93] there are several ways to accomplish such a decomposition, depending upon whether one examines first differences or deviations from proportional growth and upon how one relates imports to other elements in the system. Estimates based on one mode of decomposition are presented here,[94] but experiments with various decomposition approaches have led to the same general conclusions.

The decomposition starts from the fundamental supply-demand balance equation of input-output analysis:

$$Q_{j,t} = W_{j,t} + C_{j,t} + Z_{j,t} + X_{j,t} - M_{j,t}$$

where
$Q_{j,t}$ = gross output in sector j in period t
$W_{j,t}$ = intermediate demand for the output of sector j in period t
$C_{j,t}$ = private plus government consumption demand for the output of sector j in period t
$Z_{j,t}$ = investment demand (including net stock accumulation) for the output of sector j in period t
$X_{j,t}$ = export demand for the output of sector j in period t
$M_{j,t}$ = imports of items classified in sector j in period t.

We define import substitution as a change in the ratio of imports to domestic demand. Let $m_{j,t}$ be defined as $M_{j,t}/D_{j,t}$, where $D_{j,t}$ $(= W_{j,t} + C_{j,t} + Z_{j,t})$ is total domestic demand for the output of sector j in period t. Letting $t = S$ denote the first period, we have

$$Q_{j,S} = (1 - m_{j,S})\, D_{j,S} + X_{j,S}.$$

For the second period (T) we write,

$$Q_{j,T} = (1 - m_{j,S})\, D_{j,T} + X_{j,T} + m_{j,S}\, D_{j,T} - M_{j,T},$$

where we have both added and subtracted the term $m_{j,S} D_{j,t}$ on the right-hand side of the equation. Subtracting the expression for $Q_{j,S}$ from that for $Q_{j,T}$ yields

$$\Delta Q_{j,T} = [(1 - m_{j,S})\, \Delta D_{j,T}] + \Delta X_{j,T} + [m_{j,S}\, D_{j,T} - M_{j,T}],$$

where Δ is the first difference operator. The first term (in square brackets) on the right-hand side of the equation is the contribution of domestic demand expansion; the second term is the contribution of export expansion; and

Table 8.19. *Korea: Direct and Total Contributions to Growth, by Industry Group and Trade Category, 1955–68 and 1960–68*
(percent)

Industry Group or Trade Category	Percentage of Output Expansion Due to:									
	Domestic Demand Expansion						Export Expansion		Import Substitution	
	Intermediate		Consumption		Investment					
	Direct	Total a/	Direct	Total	Direct	Total	Direct	Total	Direct	Total
	1955-68 b/									
Primary	63.1	6.1	50.9	86.0	-4.7	2.6	4.0	19.4	-13.2	-14.2
Manufacturing	46.5	10.5	24.4	39.4	9.4	22.4	15.7	24.2	4.1	3.4
Social Overhead	23.1	5.6	18.4	26.2	49.9	54.9	8.8	12.3	-0.2	0.9
Services	44.3	1.9	43.2	62.7	8.9	22.1	5.0	14.9	-1.4	-1.6
Total	45.1	7.8	30.4	48.1	13.5	24.4	11.2	20.2	-0.3	-0.6
	1960-68 c/									
Agriculture, Forestry, & Fishing (I)	50.4	-0.5	57.6	89.4	0.1	6.0	-0.1	15.9	-7.9	-10.8
Mining & Energy (IV)	94.7	3.1	0.4	47.6	-7.0	19.9	15.9	28.2	-3.9	1.2
Primary Activities (I + IV)	54.0	-0.2	53.0	86.0	-0.5	7.1	1.2	16.9	-7.6	-9.8
Processed Foods (II)	28.5	7.3	61.9	77.8	0.0	2.7	7.8	11.7	1.8	0.5
Beverages & Tobacco (III)	29.8	5.1	59.5	69.5	4.5	14.3	4.0	9.9	2.2	1.1
Construction Materials (V)	106.9	60.2	0.1	5.1	-20.6	19.5	5.6	7.4	8.0	7.8
Intermediate Products I (VIA)	54.8	8.4	8.2	23.1	5.2	22.5	17.0	32.3	14.8	13.6
Intermediate Products II (VIB)	67.4	6.4	6.7	31.2	10.5	34.5	10.4	25.6	5.0	2.4
Nondurable Consumer Goods (VII)	16.7	0.5	38.4	47.1	2.0	5.4	36.2	40.2	6.8	6.8
Consumer Durables (VIII)	34.9	13.0	37.0	46.4	9.3	18.7	23.2	27.2	-4.4	-5.3
Machinery (IX)	43.5	22.2	7.3	11.9	90.3	105.4	8.0	12.2	-49.0	-51.8
Transport Equipment (X)	38.7	18.0	0.7	7.3	102.3	119.3	0.2	4.2	-41.9	-48.8
Manufacturing (II, III, IV-X)	45.3	9.3	25.4	39.7	11.0	25.0	15.1	24.3	3.2	1.7
Export Industries	22.4	1.1	21.3	28.3	1.7	8.5	52.7	60.4	1.9	1.8
Primary	37.0	5.6	-0.3	3.1	-3.7	4.3	76.0	92.3	-9.0	-5.4
Manufacturing	22.0	0.8	21.9	29.7	1.9	8.8	52.0	58.5	2.2	2.2
Export-&-Import-Competing Industries	61.4	12.1	5.5	24.0	23.8	40.6	47.2	61.8	-37.9	-38.5
Primary	116.0	54.6	-0.3	13.8	-10.0	31.9	21.7	33.6	-27.4	-34.0
Manufacturing	57.5	9.4	5.9	24.7	26.2	41.2	49.0	63.6	-38.6	-38.8
Import-Competing Industries	66.1	21.7	17.8	34.2	25.4	41.6	0.5	16.1	-9.8	-13.6
Primary	75.8	14.0	64.9	66.7	-10.5	-4.5	-6.6	43.7	-23.5	-19.8
Manufacturing	64.8	23.2	11.7	27.9	30.1	50.6	1.4	10.7	-8.0	-12.4
Non-Import-Competing Industries	48.2	3.3	41.8	66.3	3.5	15.7	1.4	10.9	5.1	3.9
Primary	51.7	-3.0	53.5	93.2	0.5	8.6	0.2	9.6	-5.9	-8.4
Manufacturing	46.0	6.9	34.5	50.6	5.3	19.8	2.2	11.6	12.0	11.0
All Industries	47.6	6.8	32.7	51.9	7.9	20.3	11.4	22.4	0.3	-1.4

Note: Aggregated from 117-sector estimates, except for the 1955-60 contributions, which were aggregated from 29-sector estimates. Totals may not reconcile because of rounding.

a/ Gives the contribution of technological change to the growth of the sector's output.
b/ Based on data in constant domestic prices.
c/ Based on data in constant world prices.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Table N.

the last (in square brackets) is the contribution of import substitution. Import substitution is measured as the difference between actual imports and the imports that would have been observed had the first period's import ratio been realized in the second period. (It may also be expressed as *minus* the change in the import coefficient times domestic demand in period T.)

It is important to recognize that this decomposition yields biased estimates, in that the choice of the first period as the base period for defining the import ratio is arbitrary. The approach taken here to circumvent the implied index number problem is to use "chained" measures.[95] Rather than apply the decomposition simply to the data for 1955 (or 1960) and 1968, we have separately decomposed the change in output over each interval for which we have input-output data; the estimates for each are then summed to give the growth contributions between 1955 (or 1960) and 1968. (This means, for example, that the contribution of import substitution may be positive over the entire period even though the import share in the terminal period slightly exceeds that in the initial period.)

Measures of import substitution are also sensitive to the level of aggregation employed. Estimates based on highly aggregated data reflect changes both in the conditions of supply at the micro level and in the composition of domestic demand. In our investigation of incentive policies, we are primarily interested in the import substitution stemming from changes in the conditions confronting suppliers. The aggregate estimates presented below are thus aggregates of the growth contributions calculated for sectors individually, rather than from data aggregated over the sectors.

The method of decomposition outlined above yields only the direct contributions of export expansion and import substitution to aggregate growth. The full contribution of either includes part of what is attributed to the growth of domestic demand. The additional, indirect contributions of export expansion and import substitution include: a backward linkage effect due to increased derived demand for domestically produced intermediate inputs; a multiplier effect due to expenditure out of the additional income generated by the rise in production; and a foreign exchange effect due to increased production made possible by the foreign exchange earned or saved. These effects are most striking in cases in which factors of production would otherwise have been unemployed, but they also increase allocative efficiency whenever the domestic resource cost, at shadow prices, of exporting or substituting for imports is less than the shadow-price value of the corresponding foreign exchange earnings or savings. Moreover, either current or future consumption may be increased, the latter through a rise in the investment rate.

Of these indirect contributions, we have estimated only that due to the backward linkage effect. To incorporate this effect, the growth of intermediate demand for each sector's output must be traced back to domestic final demand growth, export expansion, and import substitution in the industries demanding the sector's output on intermediate account. In addition, one must distinguish the change in demand owing to changes in input-output coefficients. This source of change in demand is typically attributed to technological change, but it includes the effect of shifts in the intrasectoral composition of production on intermediate input use. The "total" contributions—direct plus indirect through backward linkages—of domestic final demand growth, export expansion, import substitution, and technological change can be calculated by means of the inverse Leontief matrix. We give estimates of both the direct and the total growth contributions.[96] Only the former are relevant for assessing how producers within sectors have responded to incentive policies. The latter, however, are relevant for measuring the contributions of export expansion and import substitution to the economy's growth.

The growth contribution estimates in Table 8.19 state the proportion of each sector's output change that is attributable to each source. Note first the estimates of contributions to aggregate growth, given at the top of the table.

In aggregate terms, the expansion of exports contributed far more to Korean economic development than did import substitution. The total contribution of exports to the change in aggregate output between 1955 and 1968 was 20 percent. Most of this is attributable to the growth of manufactured exports, which accounted for 75 percent of the change in total exports and 93 percent of the change in commodity exports.[97] The overall contribution of import substitution was negative, though near zero; its modest contribution to the growth of manufacturing was more than offset by the rising import shares in other sectors of the economy.

Backward linkages from exports were responsible for nearly a tenth of the growth of manufactured output and more than 15 percent of the growth of primary output. In contrast, the total contribution of import substitution to the change in aggregate output was *less* than its direct contribution; this indicates that the import substitution that occurred in some sectors raised the demand for intermediate products that were imported and thus had negative backward linkage effects in the aggregate. (Thus, import substitution generated indirect demands on sectors that had higher than average requirements for imported intermediate goods.)

As expected, the growth of domestic final demand was the most important factor, accounting for more than 70 percent of aggregate output growth between 1955 and

Table 8.20. *Korea: Direct Contribution of Trade to Growth, by Industry Group, 1960–68*
(percent)

Industry Group	Trade Contribution, 1960–68	Absolute Value a/		Period of Greatest Contribution to Sector's Own Growth			
		Export Expansion	Import Substitution	Export Expansion		Import Substitution	
				Period	Contribution	Period	Contribution
VII	43.0	39.3	7.3	1963–66	96.0	1960–63	27.9
VIA	31.8	27.7	24.1	1963–66	23.2	1963–66	49.8
VIII	18.8	3.8	-0.7	1963–66	27.0	1960–63	50.4
VIB	15.4	13.3	6.3	1963–66	23.9	1966–68	7.1
V	13.6	1.4	2.1	1963–66	10.9	1963–66	20.1
IV	12.0	2.9	-0.7	1963–66	24.1	1963–66	12.4
II	9.6	7.3	1.7	1963–66	37.1	1966–68	2.9
III	6.2	2.2	1.2	1963–66	11.4	1960–63	26.4
I	-8.0	-0.3	-16.7	1963–66	2.8	1963–66	17.0
IX	-41.0	1.5	-9.1	1963–66	47.4	1963–66	-16.9
X	-41.7	0.1	-12.5	1963–66	1.8	1966–68	-11.8

a/ Thousand million won in constant world prices.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," p. 4-36.

1968. Both consumption and investment demand had strong backward linkages; almost half the growth in output can be traced to consumption growth, and almost a quarter to the growth of investment. The residual attributable to changes in input-output coefficients appears as the total contribution of growth in demand for intermediate goods. The general rise in intermediate input requirements was responsible for nearly 8 percent of the growth of output.

The table below compares the relative importance of export expansion and import substitution over time. The figures show the *total* percentage contribution of each to the growth of aggregate output for each subperiod:

	1955–60	*1960–63*	*1963–66*	*1966–68*
Export expansion	12.9	6.3	31.4	21.3
Import substitution	10.2	−6.9	8.9	−6.6

Export expansion contributed more to the growth of output of goods in each subperiod than did import substitution. The greatest contribution of export expansion and import substitution together was realized between 1963 and 1966, the period of major policy reforms in which Korea began its rapid growth. Primary export growth and import substitution in manufacturing were characteristic of the earlier period. Manufactures dominated the growth of exports after 1960, and in relative terms there was much less import substitution in the 1960s than there had been in the late 1950s.

The *direct* percentage contributions of export expansion and import substitution to the growth of *manufactured* output in each subperiod are also revealing:

	1955–60	*1960–63*	*1963–66*	*1966–68*
Export expansion	5.1	6.2	29.4	13.0
Import substitution	24.2	0.9	14.4	−0.1

In the late 1950s there was extensive import substitution in consumer nondurables and light industry intermediate products, whereas exports played a relatively minor role in industrialization. Export growth made its most important contribution to industrialization in 1963–66 and continued to be of considerable consequence afterward.

Estimates of the direct contributions of export expansion and import substitution for individual industrial groups can be analyzed only for 1960–68. Table 8.20 gives a ranked list of the industry groups according to our estimate of the direct contribution of trade to the change in the output of each. Trade effects were greatest in intermediate products and consumer goods, which were also the major sources of the growth of total domestic demand and output (see Table 8.18). There was negative import substitution in the production of investment goods. In line with our earlier findings, export

expansion contributed more to the growth of *every* group (except construction materials) than did import substitution. Again, 1963–66 stands out as the period in which exports contributed more to growth than did import substitution.

Even at the most disaggregated level, import substitution played a relatively modest role in the growth of most industries over the entire eight-year period. Thus, in only 12 of the 80 manufacturing sectors was import substitution responsible for more than 20 percent of the sector's growth. Among these 12 were sectors producing fertilizers, petroleum products, sewing machines, electrical equipment and products, drugs, steel ingots, paper and paperboard, basic inorganic chemicals, and cast and forged steel (listed in order of the contribution of import substitution, as shown in Table 8.27). Sectoral import shares actually increased, so that import substitution was negative, in 39 of the manufacturing sectors and in 8 of the 12 primary sectors.

Export expansion was the source of more than 20 percent of the growth of 20 manufacturing sectors. Included among these were sectors producing textile products at different levels of fabrication, miscellaneous manufactured products, lumber and plywood, apparel and accessories, electronics and electrical equipment (Table 8.26). In turn, the expansion of domestic demand was responsible for more than 80 percent of the individual sector's growth in 53 out of 80 manufacturing sectors; thus, the importance of domestic demand growth observed in the aggregate carries through for the individual sectors as well.

The pattern of manufacturing growth from 1960 to 1968 was clearly one of widespread export expansion, concentrated in the labor-intensive sectors (see below), coupled with selective import substitution, primarily in sectors producing basic intermediate products. A study by Suh analyzes direct growth contributions through 1973.[98] The results of his study unfortunately cannot be compared with the estimates presented above for the period through 1968, partly because Suh uses a different sectoral classification and level of aggregation, but more important, Suh's estimates are based on data in current prices. His estimates nonetheless document the considerable increase in the contribution of exports to economic growth and the continued unimportance of import substitution in the aggregate. Suh's results also indicate an increase since 1968 in the relative importance of the heavy industrial sectors in the growth of manufacturing, both with respect to the domestic market and exports.[99] This is brought out in Table 8.21, in which contributions to the growth of aggregate industrial output are decomposed to show the relative contributions of light and heavy industry.

Among the sectors classified as heavy industry, those contributing most to the expansion of exports from 1968 to 1973 were chemicals, steel products, finished metal products, and electrical machinery and appliances. The sectors in which import substitution was substantial between 1968 and 1973 included fiber spinning and textiles, rubber products, chemicals, iron and steel, finished metal products, and nonelectrical machinery. With the exception of the last two industries, import substitution was concentrated in the production of intermediate goods and took place largely between 1968 and 1970. Much of this import substitution was due to the production of basic steel products and petrochemical derivatives in medium-scale plants.

IMPORT SUBSTITUTION AND BACKWARD LINKAGES FROM EXPORTS. The role of import substitution in Korea's industrial development deserves further comment. The absence of widespread, large-scale import substitution can be attributed partly to the selective pattern of backward linkages that were realized from exports to the domestic production of intermediate inputs.

The share of domestic value added (direct and indirect) in Korea's manufactured exports remained almost constant at 50 percent over most of the decade after 1965.[100] This was not a consequence of the system of export incentives, since it did not discriminate between the use of imported and domestically produced intermediate inputs of the same quality in the production of exports (except insofar as wastage allowances on imported inputs encouraged the use of the latter). By avoiding excessive subsidies to backward integration from exports, this system appears to have induced only those backward linkages that permitted efficient production. (Here it is nonetheless important to note that additional import substitution incentives have been granted to those sectors—for example, petrochemicals—for which it can be argued that inefficient production has been established in part to supply exporters.)

The high import content of Korea's exports stems first from the types of product being exported. There are a few manufactured exports, including silk textiles, cement, and ceramics, for which Korea does have the requisite natural resource base. Most other exports, such as cotton and wool textile products, plywood, and steel products, require raw materials—cotton, wool, roundwood, iron ore, anthracite coal—that are either in short supply locally or prohibitively expensive. In several of these cases, import substitution for intermediate inputs has been carried back to the stage at which only the unprocessed natural resource product is imported; thus, for example, natural-fiber yarns are produced domestically, as is steel. Many exports, however, such as petrochemical-based products (until recently) or electronic assembly (even now), require intermediate inputs

Table 8.21. *Korea: Direct Contributions to Manufacturing Growth, 1960–73*
(percent)

Period and Sector	Domestic Demand Expansion	Export Expansion	Import Substitution	Total
1960-68				
Light Industry	56.9	10.8	-1.0	66.7
Heavy Industry	25.8	1.2	6.3	33.3
Total Manufacturing	82.7	12.0	5.3	100.0
1968-73				
Light Industry	40.1	21.8	-0.8	61.1
Heavy Industry	30.3	9.1	-0.6	38.9
Total Manufacturing	70.4	30.9	-1.4	100.0
1960-73				
Total Manufacturing	73.1	26.8	0.1	100.0

Note: Based on data in current prices. Totals may not reconcile because of rounding.

Source: Suk Tai Suh, "Import Substitution and Economic Development in Korea," Korea Development Institute Working Paper, no. 7519 (Seoul, 1975), Table 5.5.

for which the Korean market has been too small to justify production on an efficient scale or for which sophisticated and costly technological know-how is needed.

Taken together, the large contribution made by export growth to Korea's industrialization and the selective exploitation of backward linkages from exports help to explain why import substitution has played such a subordinate part. While some backward linkages from exports have been exploited through import substitution, the rapid change in the composition of exports has offset the import substitution that has occurred, with the result that the share of domestic value added in aggregate exports has remained roughly constant.

Another factor limiting import substitution has been government policy toward imports of consumer durables and other luxury consumption goods. Such imports—automobiles, refrigerators, television sets, and the like—have been prohibited for the most part, so that almost all the latent domestic demand for these goods has been satisfied only after the start of domestic production. Thus, the government has managed to delay their purchase in significant quantities until they could be produced locally; strictly speaking, the resulting pattern of growth cannot be called import substitution. The mathematics of calculating growth contributions implicitly recognizes this distinction by assigning a very low weight to these sectors in the aggregate import substitution estimates because of their initially small share in domestic demand.

The rapid growth of foreign exchange receipts from exports has been a key factor in allowing import substitution to be selective. Also not to be overlooked is the fact that the pursuit of an economy's comparative advantage is a matter not only of the composition of exports and imports but also of their size relative to domestic production and consumption. Compared with other countries at similar income levels, Korea had abnormally small shares of both exports and imports in GDP at the end of the Korean War, and to pursue its comparative advantage Korea has been obliged to increase the shares of both to atypically high levels.[101] In turn, selective import substitution has permitted scarce investment resources to be concentrated in one or a few sectors at a

time, and has thereby allowed greater exploitation of economies of scale and of the linkages among closely interrelated activities.[102]

Factor Allocation and Use

Simply to demonstrate that exports contributed substantially to Korea's industrialization does not establish that Korea's strategy has been efficient in terms of factor use. The issue of paramount concern is how Korea's industrial strategy has affected the growth of GNP and the attainment of other development objectives, in comparison with alternative strategies that might have been pursued. A full examination of this issue would require counterfactual experiments using a sophisticated general equilibrium model that has been validated against the observed history—an approach that has not yet been attempted for Korea. Furthermore, there are undoubtedly additional indirect effects from exporting that would be hard to capture in such a model; for example, the exploitation of economies of scale through increased market size and the stimulus that competition in foreign markets provides for technological change.

Additional research would be required to gauge whether Korea has benefited in these ways as a result of following an export-led strategy. But there is ample evidence—though it is presumptive rather than conclusive—that emphasis on exports has resulted in a generally efficient allocation of resources. This conclusion is discussed below in terms of the factor intensity of Korea's exports and imports and the increase in its factor use over time.

Factor Intensity of Trade

The determinants of comparative advantage are many and complex. They include elements such as natural resource endowment, labor skills, and learning-by-doing and other dynamic phenomena, which are either difficult to quantify or have not been quantified with sufficient precision in the case of Korea. Nonetheless, to the degree that Korea's comparative advantage during the 1960s may be said to have been in labor-intensive as opposed to capital-intensive activities, a partial assessment is possible.

Our analysis of the factor intensity of Korea's trade follows Leontief's approach.[103] Using labor and capital input coefficients based on Korean data, we have estimated the average direct as well as total factor input coefficients associated with Korea's exports and imports. The underlying factor input coefficients for each of the 117 sectors are averages obtained by dividing each sector's output into the estimated magnitude of factor employment in that sector. These coefficients are thus weighted averages in which the weights correspond to the intrasectoral composition of production. Correspondingly, estimates of the factor intensity of trade based on these coefficients are in error to the degree that the intrasectoral composition of trade flows (whether exports or imports) differs from that of production, on the assumption that factor intensities differ among activities within sectors. Using data disaggregated to the 117-sector level, however, helps minimize this error.

Interpretation of estimated average input coefficients is straightforward. For exports, the coefficients give the estimated average direct (or total) input requirements per unit of exports, when the composition of a unit of exports is proportional to that of the particular bundle of exports being considered. The estimated average input coefficient for a bundle of imports is to be interpreted as that which would pertain had the bundle been produced domestically.[104]

The intermediate input coefficients used in the calculation of total factor requirements include imported inputs. Thus, in computing the average total input coefficient for a bundle of imports, it is assumed that intermediate imports would also be replaced. To obtain consistent total factor input coefficients for both imports and exports requires the use of the same input-output coefficients in both cases. The total factor input coefficient relating to exports has therefore been calculated on the assumption that all intermediate input requirements would be produced domestically. This consideration, along with other arbitrary elements in the calculation of total factor inputs, strongly suggests that the direct factor input estimates are the most relevant.[105]

The years for which detailed input-output statistics were available are covered in Table 8.22, which gives the average direct and total factor input coefficients for exports and imports of primary and manufactured products separately as well as for total (including services and social overhead) exports and imports. The comparable average input coefficients for total domestic production are also shown. Entries in the L columns represent labor input coefficients in man-years per million won of output at 1965 prices; entries in the K columns represent the capital-input coefficients or capital-output ratios; and entries in the L/K columns, the derived labor-capital ratios in man-years of employment per million won of capital (inclusive of inventories) at the domestic currency equivalent of 1965 world prices.

There were no reliable time-series data on factor input coefficients at the 117-sector level when this investigation was undertaken. Factor input coefficients estimated for 1968 were thus applied to trade data for 1960, 1963, and 1966, as well as 1968. Intertemporal changes in the

Table 8.22. *Korea: Factor Intensity of Trade, 1960–68*

Item	1960 L	1960 K	1960 L/K	1963 L/K	1966 L/K	1968 L	1968 K	1968 L/K
			Direct Factor Requirement					
Primary								
Domestic Output	10.86	0.65	16.60	17.20	17.08	10.74	0.63	17.16
Exports	7.54	0.92	8.19	6.89	6.15	6.27	1.10	5.69
Imports	11.06	0.67	16.58	15.91	16.13	11.28	0.73	15.48
Manufacturing								
Domestic Output	1.63	0.55	2.97	2.89	2.67	1.53	0.58	2.64
Exports	1.87	0.69	2.72	3.02	3.24	1.89	0.53	3.55
Imports	1.29	0.62	2.09	1.93	1.98	1.54	0.66	2.33
Total a/								
Domestic Output	5.44	1.24	4.39	4.59	4.46	4.48	1.09	4.12
Exports	4.83	1.49	3.25	2.52	2.41	2.56	1.22	2.10
Imports	3.37	0.74	4.53	4.87	4.05	2.96	0.70	4.29
			Total Factor Requirement					
Primary								
Final Demand less Imports	12.86	1.12	11.46	11.79	12.10	13.36	1.06	12.61
Exports	9.84	1.49	6.55	5.75	5.13	8.29	1.73	4.81
Imports	12.99	1.08	11.99	11.50	11.90	13.06	1.16	11.30
Manufacturing								
Final Demand less Imports	8.92	1.64	5.43	5.41	5.03	8.53	1.66	5.14
Exports	7.89	2.11	3.74	3.71	4.09	7.91	1.83	4.29
Imports	5.06	1.84	2.77	2.40	2.40	5.56	2.03	2.74
Total a/								
Final Demand less Imports	9.50	2.16	4.39	4.59	4.46	9.32	2.26	4.12
Exports	8.12	2.38	3.42	3.05	3.25	7.53	2.38	3.15
Imports	6.74	1.79	3.78	3.66	3.26	6.62	1.89	3.48

Note: L: Man-years per million won of production, in 1965 domestic prices.
K: Capital-output ratio. Capital includes inventories and is measured in world prices; output is measured in 1965 domestic prices.

a/ Also includes social overhead and services.

Sources: For estimates of the sectoral labor coefficients, we have relied upon the labor input coefficient estimates provided along with the Bank of Korea's 1966 input-output table (Economic Statistics Yearbook, 1969, p. 383, "Labor Coefficients Based on Workers"). These data are given at the 43-sector level only; we have assumed that the same labor input coefficient pertains to all the sectors at the 117-sector level that comprise a single sector at the 43-sector level. For estimates of the capital-output ratios, we have relied upon Han Kee Chun's exhaustive retabulation of the 1968 National Wealth Survey [Han Kee Chun, "Estimates of Korean Capital and Inventory Coefficients in 1968" (Seoul: Yonsei University, 1970; processed), Tables 7.1 and 7.3]. By virtue of the estimation method, Han's capital-output ratios for the manufacturing sectors give marginal rather than average input coefficients. Nonetheless, for estimates of average capital-output ratios in 1968, they are considered superior to the average ratios obtained from the National Wealth Survey. We experimented with several other sets of capital-output ratio estimates; the basic conclusions are not sensitive to the set of estimates employed. Constant 1965 domestic price input-output data on production, exports, and imports were used to calculate factor input requirements. The factor input coefficients were deflated to obtain the proper input coefficients per thousand million won of output in 1965 prices. The 1966 117-sector input-output matrix, deflated to 1965 prices, was used to obtain total factor input requirements. We have omitted real estate and ownership of dwellings, iron scrap, and other scrap from the calculation of input requirements.

estimated factor intensity of exports and imports reflect solely changes in their intersectoral composition, just as the difference between the estimated factor-intensity ratios for comparable export and import bundles results from the variations in composition of these bundles.

The estimates in Table 8.22 indicate that Korea's manufactured exports were more labor intensive than its imports throughout 1960–68. The labor-capital ratio for manufactured exports in 1968 was 3.5 compared with 2.3 for manufactured imports. Furthermore, within manufacturing, exports were substantially more labor intensive than domestic production, since the latter had an average labor-capital ratio of 2.6. Primary and total exports were more capital intensive than the respective import bundles. The contrast between the factor intensity of trade in manufactures and that in other products may be explained by the complementarity of capital and natural resources. The effect of Korea's natural resource endowment on its composition of trade in primary products has led it to export relatively capital-intensive minerals and to import highly labor-intensive agricultural products.

It is also significant that Korea's manufactured exports have become more labor intensive over time, both in absolute terms and relative to manufactured imports. The composition of Korea's manufactured exports shifted between 1960 and 1968 to increase the direct labor-capital ratio in manufactured exports by approximately 30 percent, even though changes in composition led to a steady fall in the direct labor intensity of manufacturing production. Thus, whereas Korea's manufactured exports were less labor intensive than its average manufacturing in 1960, they were more labor intensive by 1968.

The direct labor intensity of manufactured imports was less than that of manufacturing production throughout the period. The capital intensity of Korea's manufactured imports increased somewhat between 1960 and 1966 but then declined in 1968; this pattern suggests that until 1966 import substitution replaced relatively labor-intensive imports.

Most of the qualitative conclusions that may be drawn from direct factor intensities are also supported by the estimates of total factor intensity shown in Table 8.22. The shifts over time in the composition of manufactured exports and imports, when translated into changes in labor-capital ratios, suggest that Korea followed its comparative advantage within the expansion of the manufacturing sector. Largely because of the growth of agricultural imports, however, total exports did not become increasingly labor intensive in comparison with total imports. This fact need not imply that resources were being allocated inefficiently within the primary sector, since one must also consider Korea's natural resource endowment. The relative abundance of some minerals led to their export, and it was doubtless efficient to import at least some food grains given Korea's poor climate and land.

Hong investigated the factor intensity of trade up to 1973.[106] Once allowance is made for differences in estimation methods and in the presentation of results, Hong's estimates for manufactured products in 1960–68 are consistent with those given above. He indicates an increase for 1968–73 in the capital intensity of manufactured exports, both in absolute terms and relative to factor proportions in manufacturing as a whole, and also with respect to the direct and total factor intensity measures. In part, this increase is due to capital deepening in the manufacturing sector and to the rapid increase in labor productivity, as Hong documents by means of capital-labor ratios, by sector, specific to each year. Particularly after 1970, this trend may also be traced to increases in exports of cement, steel, fertilizer, textiles, and various items based on petrochemical derivatives. Either directly or indirectly, all these products require capital-intensive production methods in plants subject to severe economies of scale. Once it has been decided to meet the domestic demand for these commodities through domestic production, temporary exports can be a means of justifying the construction of large plants whose capacity would initially be too large for domestic demand, and the cost of realizing greater economies of scale can thereby be reduced. But even without this consideration, exports of cement, steel, and fertilizer during the first half of the 1970s may well have been in Korea's dynamic comparative advantage.

Trends in Factor Use

Among the outstanding features of Korea's overall development performance is the increase in the rate of factor use. As noted at the outset, Korea has been relatively successful in finding employment for its labor force, which has grown at an average rate of 3.2 percent a year since 1960. The unemployment rate fell from a peak of 8.3 percent in 1962 to 4.1 percent in 1975. There might well have been serious unemployment, certainly in urban areas, had not exports of light, labor-intensive manufactures grown rapidly. Table 8.23 presents estimates of the share of employment owing to exports, taken from a 1975 study based on input-output data. The indirect employment included in the total estimates accounts for only that induced by backward linkages, so that multiplier and foreign exchange effects on employment are neglected. Even so, exports are seen to have accounted for more than one quarter of manufacturing employment and close to 10 percent of total employment in 1970. The contribution of export expansion to in-

Table 8.23. *Korea: Percentage of Employment Due to Exports, 1960–70*

Item	1960	1966	1970
Manufacturing Sectors			
Direct Employment in Production for Export	2.9	13.6	18.9
Total Employment Due to All Exports	5.8	19.0	25.9
All Sectors			
Direct Employment in Production for Export	2.4	3.4	5.1
Total Employment Due to All Exports	3.7	6.7	9.1

Note: The "A" employment estimates given by Cole and Westphal for 1960 have been converted to correspond to the "B" estimates for 1966 and 1970 by applying the ratio of the "B" to the "A" estimate for 1966 to the corresponding figure for 1960.

Source: David C. Cole and Larry E. Westphal, "The Contribution of Exports in Korea," in Trade and Development in Korea, ed. Wontack Hong and Anne O. Krueger (Seoul: Korea Development Institute, 1975), Table 1.

creased employment is even more impressive. The same study estimates that between 1960 and 1970 the growth of exports was responsible for 38.3 percent of the growth of employment in manufacturing and 32.7 percent of the growth of total employment. (Both estimates take account of the indirect employment generated by exports.)

Korea has also been successful in increasing the degree of capacity utilization within the manufacturing sector. The most reliable statistics showing the trend of capacity utilization rates are based on electricity use and define 100 percent capacity utilization as plant operation 24 hours a day, 365 days a year. On this basis, the unweighted average capacity utilization rate within manufacturing as a whole increased at an annual compound rate of 7.2 percent, from 17.7 percent in 1962 to 31.9 percent in 1971 (the survey from which these results are taken does not extend beyond 1971).[107] A capacity utilization rate of 31.9 percent (on the average, roughly the same as single-shift operation throughout all of industry) is quite high by international standards, even when developed economies are included in the comparison. Although it is not possible to state whether and by how much the expansion of exports contributed to the increase in capacity utilization, there is little doubt that it played a significant role.

The trends in the aggregate labor-capital ratio and factor productivities within manufacturing are also noteworthy. These trends are summarized in Table 8.24, which is based on data from Hong's study.[108] The labor-capital ratio in manufacturing rose almost continuously during the first half of the 1960s, and then fell almost continuously through 1972, again rising in 1973. By 1973 the labor-capital ratio exceeded that in 1960 by more than 15 percent. With output measured by value added, both the output-capital and output-labor ratios rose continuously during this entire period. By 1973 the output-capital ratio had risen to more than twice its value in 1960, while the output-labor ratio increased by nearly 100 percent. Total factor productivity thus almost doubled over thirteen years, to give an annual increase of more than 5 percent. The estimated change in total factor productivity reflects changes both in industrial composition and increased factor productivity at the firm level. The former constitutes increased economic efficiency through changes in the allocation of resources, while the latter reflects increased factor utilization as well as "pure" productivity change, which in turn may be due to changes in technique and the scale of production, or to technological progress at the micro

Table 8.24. *Korea: Factor Use in Manufacturing, 1960–73*

Item	1960	1966	1970	1973
Value Added (million U.S. dollars; 1970 prices)	392.8	804.5	1,803.0	3,215.6
Employment (thousand persons)	447.0	958.0	1,448.0	2,020.0
Capital Stock (million U.S. dollars; 1970 prices)	772.0	1,273.2	2,137.8	2,808.5
Labor-Capital Ratio	0.62	0.75	0.68	0.72
Value Added-Capital Ratio	0.51	0.63	0.84	1.14
Value Added-Labor Ratio	0.82	0.84	1.25	1.59

Source: Wontack Hong, Factor Supply and Factor Intensity of Trade in Korea (Seoul: Korea Development Institute, 1976), capital stock, Table A.22; employment, Table 7.6; value added, Table A.27.

level. Unfortunately there have been no sufficiently detailed investigations to distinguish between these sources in the Korean case.

Incentives and Structural Change

Additional evidence regarding the efficiency of Korea's industrialization may be found in the estimates of effective incentive rates. Although the protection of infant industries, the need to raise revenues from tariffs, and the pursuit of social and political goals through manipulation of the price mechanism argue in favor of some divergence between world and domestic prices, world prices provide a standard against which the effects of incentive policies can be appraised. Large divergences from world prices suggest that resource allocation may be inefficient.

We observed that Korea's nominal and effective incentive rates in 1968 were very low in comparison with those in many other developing economies. Equally important, effective incentive rates varied relatively little among sectors in Korea, with those on export sales being somewhat less variable than those on domestic sales. As is widely known, effective incentive rates reflect intersectoral differences both in factor remuneration rates and comparative efficiency, so that it cannot be ascertained without further evidence whether a high effective incentive rate, for example, is associated at the margin with higher than average profits or with inefficient production. But low and relatively uniform effective incentive rates obviously leave little room for either excess profits or inefficiency.

A complete analysis of the relationship between incentives and resource allocation would require information on effective incentive rates ex ante, as well as on how the economy's structure might have evolved under alternative policy regimes. Unfortunately, we have no such information. We can, however, examine correlations between effective incentive rates and corresponding measures of resource allocation to obtain some insight into the proper interpretation of the former.[109]

Because our estimates of effective incentive rates are based on nominal rates of protection from price comparisons, they are ex post rather than ex ante measures. That is, given the apparent stability of incentive policies over at least the four years from 1965 through 1968, our estimates reflect changes in the direction and efficiency of resource allocation that were induced by the system of incentives. As noted earlier, effective incentive estimates appear to be indicative of relative efficiency in Korea, since there is little evidence that factor markets were distorted. This proposition receives further support inasmuch as the speed of structural change in Korea's economy reflects the mobility and adaptability of its labor force and the fast pace of capital accumulation.

Estimates of effective incentives to sales in the domestic and export markets may also reflect the relative profitability of selling in these markets. Indeed, the rank correlation between the estimates of effective subsidy rates on export sales and those on total sales is only 0.26 and the simple correlation only −0.09; these values suggest that incentives strongly affected effective subsidies to exports. By contrast, comparative efficiency appears to dominate the estimates of effective subsidy rates on domestic sales, since the rank correlation between these and effective subsidy rates on total sales is 0.96, whereas the simple correlation is 0.48.

Table 8.25 gives the rank correlation coefficients be-

Table 8.25. *Korea: Rank Correlations between Measures of Incentives, Efficiency, and Resource Allocation, 1960–68*

Item	Export Expansion: Exports as Percentage of Domestic Production, 1968	Export Expansion: Proportional Contribution of Export Expansion to Sector's Output Growth, 1960-68
Measure of Incentives		
Effective Protection to Exports		
Balassa	-0.16 a/	-0.15
Corden	-0.13	-0.06
Effective Subsidy to Exports		
Balassa	0.29 c/	0.26 b/
Corden	0.28 c/	0.32 c/
Possible Measure of Efficiency		
Effective Subsidy to Exports		
Balassa	0.01	0.04
Corden	0.01	0.04

Item	Import Substitution: Imports as Percentage of Domestic Supply, 1968	Import Substitution: Proportional Contribution of Import Substitution to Sector's Output Growth, 1960-68
Measure of Incentives		
Legal Tariffs	-0.27 c/	0.03
Nominal Protection	0.30 c/	-0.19 a/
Effective Protection to Domestic Sales		-0.06
Balassa	0.32 c/	-0.14
Corden	0.32 c/	-0.15
Effective Subsidy to Domestic Sales		
Balassa	0.40 c/	-0.14
Corden	0.39 c/	-0.15
Possible Measure of Efficiency		
Effective Subsidy to Total Sales		
Balassa	0.38 c/	-0.16 a/
Corden	0.38 c/	-0.16 a/

a/ Correlation is significant at the 0.10 level.
b/ Correlation is significant at the 0.05 level.
c/ Correlation is significant at the 0.01 level.

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Table S.

tween effective incentive rates and measures of observed resource allocation, obtained at the 117-sector level. Neither the shares of exports in domestic production nor the growth contributions of export expansion are significantly related to effective protection rates on export sales. Both, however, are significantly (at the 0.05 level or better) and positively associated with effective subsidy rates on exports.

The results demonstrate the importance of tax and credit preferences within the package of export incentives and suggest that export incentives encouraged the expansion of exports. Neither measure of resource allocation is correlated with the effective subsidy to total sales; this is consistent with our finding that the production of some of Korea's exports, including several major product groups such as plywood, appears to have been inefficient.

The relationship between incentives and imports prompts a different set of conclusions. Shares of imports in domestic supply are inversely related to legal tariff rates. Legal protection, however, tended to be redundant for sectors in which domestic production was well established, while it was sometimes reinforced by quantitative restrictions if domestic production was still a relatively small share of supply. Nominal protection and import shares are positively correlated, and the correlation is significant at the 0.01 level. That the correlations between effective incentive rates on domestic sales and import shares are also significantly positive at the same confidence level indicates that import substitution had progressed least in sectors having the highest effective incentives. Moreover, although insignificant, the correlations between effective incentive rates on domestic sales and the growth contributions of import substitution are negative, as is to be expected if import substitution had progressed least in sectors in which incentives were greatest.

These results can be interpreted in two ways. Possibly, import substitution was carried further in the more efficient sectors, since effective subsidy rates on total sales are significantly positively related to import shares, and negatively related to the growth contributions of import substitution. Alternatively, higher protection was given to the less efficient sectors, since high import shares and the absence of import substitution are presumptive evidence of comparative inefficiency.

For more detailed insights, consider the data in Tables 8.26 and 8.27, which cover selected major export and import-substitution sectors at the 117-sector level. Within manufacturing, the export sectors listed in Table 8.26 contributed more than 1 percent to the growth of manufactured exports between 1960 and 1968. Within the primary group, the major export sectors are those which contributed most to the growth of primary exports. Major import-substitution sectors have been identified only within manufacturing; each sector listed in Table 8.27 supplied more than 1 percent of the total contribution of import substitution to manufacturing output growth. Sectors that are thus classified as both major export and major import-substitution sectors have been designated by an asterisk in these tables. In Table 8.26 sectors are ranked according to the contribution that exports made to their growth, and in Table 8.27 according to the contribution that import substitution made to their growth (see column 5 of each table).

Between 1960 and 1968 the major primary export sectors grew at 13 percent a year, a rate which substantially exceeded the 8.1 percent growth rate of the primary sector as a whole. In contrast, the major export sectors within manufacturing that were not also major import-substitution sectors grew at an annual rate of 12 percent, which was considerably less than the 16 percent aggregate growth rate of manufactured output. This difference is due to the slow growth of domestic demand for the output of these sectors. The major import-substitution sectors that were not also major export sectors grew at 16 percent, while those classified under both headings grew at a compound annual rate of 24 percent.

The major export sectors were together responsible for 96 percent of the total change in exports between 1960 and 1968. The growth of exports in the four primary export sectors offset the decline in other primary exports; thus, these four sectors contributed more to the growth of total exports than did all the primary sectors together. The four principal manufacturing export sectors were lumber and plywood, knit products, apparel and accessories, and other manufactured products (mainly wigs); together these accounted for 53 percent of the growth of total exports.

In a majority of the major export sectors, export growth accounted for more than a third of the sector's expansion. Most of the major export sectors received positive effective subsidies to exports; a number received higher than the average effective subsidy for exports. Moreover, in 13 of the 19 major manufacturing export sectors, the effective subsidy on exports was higher than that on domestic sales. In the other six sectors, however, there appears to have been a bias in favor of domestic sales. The subsidy rate on exports in these cases undoubtedly understates the incentive to export, for we have already seen that exports appear sometimes to have been subsidized by linking profits on sales in a highly remunerative domestic market to export performance.[110]

The 27 major import-substitution sectors together accounted for more than three times the total import substitution that took place within manufacturing be-

Table 8.26. *Korea: Effective Incentives to Major Export Sectors, 1968*
(percent; ratio)

Sector	Share in Total Export Growth (1)	Share in Total Output Growth (2)	Exports as Share of Domestic Production 1960 (3)	Exports as Share of Domestic Production 1968 (4)	Growth Contribution of Export Expansion (5)	Effective Subsidy Rate Export (6)	Effective Subsidy Rate Average (7)	Labor-Capital Ratio (8)
All Primary Sectors a/	2.7	26.4	3.7	2.5	1.2	-2.7	20.9	17.16
Metallic Ores	1.7	0.3	67.4	70.5	78.0	2.8	-0.1	4.18
Nonmetallic Minerals	1.0	0.9	23.8	15.9	13.6	2.8	-4.2	6.02
Industrial Crops	1.0	1.7	4.8	6.1	6.8	-39.3	3.5	17.71
Fishing	0.9	2.7	11.0	6.3	3.7	11.9	1.8	3.02
All Manufacturing Sectors	97.3	73.6	2.6	11.4	15.1	12.4	-6.5	2.64
Silk Yarn	4.4	0.6	48.4	83.7	90.1	-5.2	-7.4	1.17
Knit Products	13.0	1.9	0.0	57.8	78.7	3.1	9.8	5.56
Misc. Metal Products	1.4	0.2	0.8	25.7	74.3	8.4	-1.8	2.76
Other Fabrics	5.1	0.8	0.0	36.2	72.8	20.0	1.1	2.11
Other Manufactured Products*	8.9	1.5	13.0	59.0	69.0	3.8	21.8	5.22
Lumber and Plywood*	19.3	3.8	0.7	42.6	57.6	94.7	-6.6	2.64
Processed Seafoods	5.1	1.4	17.4	33.6	42.0	-0.7	-57.2	2.54
Worsted and Woolen Fabrics	1.1	0.3	0.2	10.6	39.7	-9.0	-2.3	2.91
Apparel and Accessories*	11.3	3.3	1.1	29.7	39.4	7.9	-24.7	9.18
Electronics	3.4	1.0	3.9	37.5	37.6	0.3	62.8	5.63
Rubber Products	3.7	1.2	5.5	22.5	34.0	0.6	-44.6	1.85
Misc. Textile Products*	2.0	0.7	8.5	24.8	32.0	1.8	24.8	4.38
Rope and Fishing Nets*	1.3	0.5	6.6	22.7	25.9	21.1	-11.8	4.59
Slaughtering, Meat, & Dairy Products	2.1	1.1	0.5	10.0	22.2	28.2	-8.3	10.44
Cotton Fabrics	2.1	1.1	9.2	15.7	21.7	350.4	298.4	2.78
Electrical Equipment*	1.2	0.7	6.4	19.9	20.8	22.9	155.5	2.69
Cement*	1.4	1.7	1.2	8.2	9.2	7.1	-13.4	1.19
Processed Tobacco*	2.3	4.5	0.1	4.5	5.9	18.5	-38.8	0.68
Petroleum Products*	1.9	6.1	0.0	3.7	3.7	2.1	-69.8	0.11

Note: Columns (1) & (2): "Share in Total" is for the period 1960-68; "total" refers to that for all goods-producing sectors combined, excluding scrap and unclassifiables.
Column (5): The contribution of export growth to the sector's output growth, expressed as a percentage of the change in output for the period 1960-68.
Column (6) & (7): Measured according to the Balassa convention.

a/ The share of all primary sectors in total export growth is less than that of the four sectors listed because of a fall in exports from other primary sectors.

* Denotes a sector classified as both exporting and import-substituting; see the text for the basis of this classification.

Sources: Columns (1) to (5): Derived from input-output estimates in constant world prices.
Columns (6) & (7): Appendix Table 8.1.
Column (8): See the sources listed for Table 8.22.

Table 8.27. *Korea: Effective Incentives to Major Import-Substitution Sectors, 1968*
(percent; ratio)

Sector	Share in Total: Import Substitution (1)	Share in Total: Output Growth (2)	Imports as Share of Domestic Production: 1960 (3)	Imports as Share of Domestic Production: 1968 (4)	Growth Contribution of Import Substitution (5)	Effective Subsidy Rate: Domestic (6)	Effective Subsidy Rate: Average (7)	Labor-Capital Ratio (8)
All Manufacturing Sectors	100.0	100.0	22.4	25.3	3.2	-8.9	-6.5	2.64
Fertilizers	58.3	2.4	96.5	41.7	76.3	46.5	47.0	0.71
Petroleum Products*	133.1	8.2	100.0	6.0	51.5	-73.1	-69.8	0.11
Sewing Machines	3.2	0.3	59.4	31.7	41.0	4.9	4.2	2.16
Misc. Electrical Equipment	8.1	0.7	58.0	7.2	34.9	-822.6	-802.9	3.54
Hemp and Flax Yarns	1.3	0.1	47.5	0.6	32.9	181.0	179.1	1.53
Electrical Products	5.2	0.5	64.9	13.4	31.6	82.6	78.4	3.19
Drugs	18.5	2.0	36.9	14.3	28.8	-36.4	-36.3	2.32
Steel Ingots	11.0	1.3	28.8	7.4	26.5	-29.1	-29.1	0.49
Paper and Paperboard	9.7	1.2	34.5	9.1	25.0	4.2	4.2	0.85
Basic Inorganic Chemicals	3.1	0.5	51.3	42.1	21.8	32.8	32.3	0.66
Cosmetics and Toothpaste	2.8	0.4	60.0	1.8	21.8	3.0	3.0	3.39
Cast and Forged Steel	4.2	0.6	26.0	4.0	20.5	-17.3	-17.2	0.97
Other Manufactured Products*	12.4	2.0	78.3	21.4	19.7	47.4	21.8	5.22
Refined Sugar	7.4	1.4	38.6	19.9	17.0	-50.6	-49.3	2.63
Electrical Equipment*	4.3	0.9	82.5	61.4	15.7	160.8	155.5	2.69
Cement*	8.6	2.3	9.8	3.8	11.6	-15.1	-13.4	1.19
Grain Milling	8.6	2.5	5.9	6.0	11.2	-13.3	-13.3	7.61
Steel Sheet and Bars	6.8	2.1	48.3	48.7	10.3	1,451.6	1,592.8	0.86
Rope and Fishing Nets*	2.2	0.7	12.7	6.4	9.3	-20.2	-11.8	4.59
Glass Products	1.6	0.7	29.0	10.9	6.6	-16.4	-15.9	3.52
Misc. Textile Products*	2.0	1.0	11.7	2.9	6.4	31.7	24.8	4.38
Apparel and Accessories*	8.3	4.5	9.0	1.2	5.9	-37.5	-24.7	9.18
Other Paper Products	2.1	1.2	14.3	5.5	5.6	-10.7	-10.4	2.97
Other Clay and Stone Products	1.2	0.7	11.7	3.2	5.5	-21.8	-21.2	5.94
Processed Tobacco*	5.7	6.1	7.3	0.1	3.0	-42.4	-38.8	0.68
Coal Products	1.3	1.9	1.3	0.0	2.2	45.4	45.4	2.13
Lumber and Plywood*	1.7	5.2	2.6	0.4	1.0	-46.6	-6.6	2.64

Note: Columns (1) & (2): "Share in Total" is for the period 1960-68; "total" refers to that for all manufacturing sectors combined, excluding scrap and unclassifiables.
Column (5): The contribution of import substitution to the sector's output growth, expressed as a percentage of the change in output for the period 1960-68.
Column (6) & (7): Measured according to the Balassa convention.

* Denotes a sector classified as both exporting and import-substituting; see the text for the basis of this classification.

Sources: Columns (1) to (5): Derived from input-output estimates in constant world prices.
Columns (6) & (7): Appendix Table 8.1.
Column (8): See the sources listed for Table 8.22.

tween 1960 and 1968. Two sectors alone—fertilizers and petroleum products—accounted for 191 percent of the total (Table 8.27). There was obviously a good deal of negative import substitution elsewhere within manufacturing, particularly in machinery production. Most of the sectors in which import substitution made a relatively large contribution to growth are shown in Table 8.27, though import substitution also made a substantial contribution to the growth of the relatively small pesticide and pulp sectors.

Effective subsidy rates on the domestic and total sales of the major import-substitution sectors were less than the average for manufacturing in 14 out of 27 cases. Sectors with higher than average effective subsidies on domestic and total sales tended to have larger import shares in 1968 than did the other sectors.

To summarize the details shown in Tables 8.26 and 8.27, the patterns discerned in the overall correlation analysis do not hold uniformly for the major export and import-substitution sectors, but general conformity to the overall relationships is evident. Our results do not prove that the allocation of resources to export expansion was affected by export incentives, any more than they prove that import substitution has been generally efficient. They merely demonstrate that the available information is reasonably consistent with these contentions.

Summary and Evaluation

Until the early 1960s, Korea followed a protectionist strategy of import substitution for nondurable consumer goods. Once import substitution could go no further in these areas, the government had to decide whether to continue with an inward-looking strategy but shift to import substitution for intermediate and durable goods, or whether to adopt an outward-looking strategy providing equal incentives to exports and to import substitution.[111] On the whole, it opted for the latter.

Exporters benefited from unrestricted access to imported inputs and paid neither tariffs nor indirect taxes on inputs. By increasing the relative prices of competing imports and hence reducing the demand for them, the protection of domestic sales led to a slight overvaluation of the exchange rate, by about 9 percent in 1968. To offset the consequent bias against exports, the government provided several explicit export subsidies, including concessions on direct taxes (until 1973), credit subsidies, and generous wastage allowances on imported inputs. As a result, the average effective subsidy rates on domestic sales and exports were almost equal in 1968.

Although they were more uniform than the effective incentives to sell in the domestic market (see Table 8.10), the effective subsidy rates on exports differed among industries. There was some discrimination against primary exports that was magnified by an export tax on ginseng, one of Korea's principal primary exports, for which foreign demand is inelastic. Within manufacturing, less efficient exports were the only ones to receive important explicit subsidies. In the industries with inefficient exports, domestic sales received still higher effective subsidies than the exports, so that incentives appeared to be biased against exporting. In the more efficient industries, low nominal protection in the domestic market, which led to negative effective subsidies to domestic sales, gave rise to an incentive bias in favor of exports.

High effective incentives to domestic sales in some instances served as a subsidy to exports. To foster the development of various nontraditional industries, the government appears to have encouraged exports by making them a prerequisite for opportunities to sell in a profitable domestic market. Newly established import-substituting industries have generally been encouraged to begin exporting almost at once.

Incentives were given to import substitution in industries that received positive net effective subsidies on their total sales. Overall import restrictions were gradually liberalized, but quotas along with high tariffs continued in force to protect a number of small and inefficient industries. Moreover, the government has selectively promoted import substitution in a few nontraditional areas, the most important being producer goods and, more recently, consumer durables and automobiles. Thus many of the explicit subsidy mechanisms used to promote exports, particularly preferential credit allocations, have also been used to encourage import substitution.

In short, although outward looking, the government's strategy has not been purely one of free trade. Incentive policies, particularly the instruments of protection, have discriminated in favor of agriculture and, within manufacturing, in favor of sectors in which opportunities remained for substantial import substitution. Nonetheless, protection in the domestic market has generally been quite low by international standards. By maintaining the exchange rate near the free-trade level and granting exporters free access to imported inputs, the government has provided, on the average, almost equal incentives to production for domestic sale and for export. Moreover, although subsidies have not been uniform with respect to value added at world prices, traditional and more efficiently produced exports have not been discriminated against.

In the Korean experience, export incentives and the growth of exports seem to be related. Although efforts to establish the relationship statistically have not yielded notably robust results,[112] regressions of real exports against the (gross) real effective exchange rate and real

nonagricultural output have led Frank, Kim, and Westphal to conclude that "the responsiveness of [manufactured] exports changed sharply after 1963 . . . Before 1963, sensitivity to [effective] exchange rate policy was lacking."[113] This change appears to be due to several factors: The government's intention to stabilize exporters' profits at relatively high rates was probably clearly perceived only in 1963 or shortly thereafter, and the general productive capacity of the economy did not begin to expand rapidly until after that year. The achievement of political stability was undoubtedly another contributing factor.

As for the overall effectiveness of Korean exchange rate and incentive policies, Frank, Kim, and Westphal develop and estimate a simultaneous equation model to demonstrate that, at their historical values, the official exchange rate, import tariffs, and export incentives, taken together, achieved close to the maximum possible GNP growth rate, given the inflow of foreign capital.[114] Thus, if it is assumed that incentives to exports and tariffs on imports remained unchanged at their historical levels, the optimal official exchange rate was found to be about equal to the historical rate.

The annual increase of exports averaged nearly 30 percent a year between 1960 and 1975 in constant prices. Korean entrepreneurs have shown themselves highly responsive to export opportunities, notable examples being the rapid rise of wig exports in the early 1960s and later the fast expansion of electronics and footwear exports. Also, miscellaneous manufactures, the composition of which is continually changing, have long been a dynamic export sector.

Manufactured exports, which accounted for only 14 percent of commodity exports in 1960, had reached 82 percent of the total by 1975 and had become increasingly diversified. In 1975 Korea was a major exporter of electrical machinery and appliances, electronic products, transport equipment, various manufactures of metal and nonmetallic minerals, and footwear, in addition to wigs, textiles, clothing, and plywood, which had led the initial growth of exports. Primary exports, too, rose at a rapid rate, averaging 22 percent a year between 1960 and 1975.

There is little evidence to suggest that Korea's special relationships with Japan and the United States have been responsible for this phenomenal performance. The combined share of these countries in Korea's exports declined from 70 percent in 1960 to 56 percent in 1975. Also, direct foreign investment has played a very small part in Korea's industrial growth; in 1970 it accounted for less than 5 percent of the capital stock in the manufacturing sector and only about 11 percent of exports.

Korea has industrialized very rapidly. Between 1960 and 1975 manufacturing output grew at an annual rate of 19 percent, while manufacturing value added increased at 17 percent. Real GNP grew at 9 percent annually, and the share of manufacturing in GNP rose from 11 percent in 1960 to 32 percent in 1975. Real per capita income over this period increased by 6.6 percent a year, and by 1975 Korea's population of more than 34 million had a per capita income of more than US$500, compared with less than US$200 in 1960 (in 1975 prices).

The growth of manufactured exports over the fifteen years from 1960 to 1975 contributed to Korea's industrial development in various ways. Export expansion was directly responsible for more than one quarter of the growth of manufactured output and for an even larger fraction of the increase in manufacturing employment. In turn, the manufacturing sector has accounted for almost 40 percent of the growth in both GNP and employment. These figures understate the contribution of export growth. They do not reflect the backward linkage to domestically produced intermediate inputs, the multiplier effect resulting from increased consumption and investment out of the additional income earned, or the increase in economic efficiency that results from exporting in accordance with a country's comparative advantage.

All the available evidence suggests that factor utilization and allocative efficiency increased as a result of export growth. One indicator, albeit crude, is the fall in the open unemployment rate from 8.3 percent in 1962 to 4.1 percent in 1975. Another is the increase in the aggregate capacity utilization rate within manufacturing, which by one set of estimates rose by more than 7 percent a year between 1962 and 1971. Korea has exploited its comparative advantage in labor-intensive activities. During the 1960s, for which the evidence has been most carefully analyzed, manufactured exports were more labor intensive than manufactured imports, and they became more labor intensive over time even as shifts in the composition of output caused manufacturing for the domestic market to become somewhat more capital intensive. The aggregate labor-capital ratio in the manufacturing sector actually increased between 1960 and 1973; at the same time, total factor productivity almost doubled.

In Korea's case, resource allocation along the lines of comparative advantage has meant not only that labor-intensive exports pay for capital-intensive imports, but also that there has been an increase in the share of trade in total economic activity. In part this increase can be traced to the country's very poor natural resource endowment, which has forced Korea to depend on imports for food grains and especially for energy sources. But the rise in the share of imports in GNP from 10 percent in 1960 to 27 percent in 1975 also reflects the fact that the growth of export earnings permitted increased imports of producer goods that were not available from domestic sources. Another contributing factor has been the con-

tinued high import content of exports (around 50 percent, including indirect imports), which in turn has been necessitated by Korea's export specialization in labor-intensive processing.

The high import content of Korea's exports is not a consequence of the export incentive system, which is neutral toward the use of imported and domestically produced intermediate inputs of the same quality in the production of exports (except insofar as wastage allowances on imported inputs favor their use over those domestically produced). If the domestic market is protected and currency overvalued, free access to imported inputs, unless offset, encourages their use. Protection and currency overvaluation have both been low in Korea, however, and to offset the remaining bias, the full range of export incentives has been extended to producers of intermediate goods supplied to exporters. By avoiding excessive subsidies to backward integration from exports, this system appears to have induced only those backward linkages in which production was efficient. Additional import-substitution incentives have been granted to those industries, for example petrochemicals, where a case can be made that inefficient production has been established at government initiative and in part to supply exporters.

Until recently, however, the incentives granted to export and import-substituting activities alike have discriminated against purchases of domestically produced machinery and equipment, through tariff exemptions and easy access to credits at low interest rates tied to the purchase of imported capital goods.[115] Frank, Kim, and Westphal estimate that in the late 1960s the difference between the high interest rate on domestic commercial credit and the interest rate charged on suppliers' credits to purchase imported capital goods increased the real purchase cost (including the discounted value of interest payments) of indigenous capital goods by about 20 percent.[116] This discrimination against the domestic capital goods sector has not been captured in the estimates given in this chapter.[117] Starting in about 1973, the government began to recognize the retarding effects of its policies on the domestic capital goods sector. As a result, it has abolished automatic tariff exemptions for exporters on their capital goods imports and has established a relatively large fund to provide medium-term domestic credit at an interest rate near the world market level.

The import substitution that has taken place has been selective, and its structure has changed continuously. After 1960 import-substituting investment centered first on fertilizer and cement, then on petrochemical derivatives and electrical products, and more recently on basic petrochemicals, iron and steel, and transport equipment. Korea's industrial structure cannot be characterized as overly concentrated in the light manufacturing sectors; the heavy sectors are relatively large and expanding rapidly. The important point is that selective import substitution has permitted scarce investment resources to be concentrated in one or a few sectors at a time and has encouraged the exploitation of scale economies and of linkages among closely allied activities.

All in all, the structural changes induced by the shift to the outward-looking policy regime resulted in a more efficient allocation of resources as exports of labor-intensive manufactured products expanded to finance rapidly growing imports of food grains and capital- and skill-intensive manufactured products. Beginning in the late 1960s and continuing through the 1970s, a transition has been underway toward exploiting Korea's emerging comparative advantage in skill-intensive products. Textile exports, for example, have shifted toward quality articles of finished clothing and specialty items such as camping equipment, and away from cloth and lower quality apparel. Simultaneously, import substitution in the producer goods sectors has proceeded selectively wherever economies of scale could be achieved, though there appear to have been some cases of premature domestic production.

Part of the explanation for Korea's rapid and sustained growth thus lies in the efficiency with which available resources have been allocated,[118] and hence in the policies adopted with the changeover to an outward-looking strategy. In addition to changes in trade policy, complementary monetary and fiscal reforms played an important role. During the first half of the 1960s, the government relaxed controls on interest rates, increased tax revenues, rationalized its internal budgeting operations, and embarked on a continuous campaign of varying success to stabilize inflation at a low rate. These policies greatly increased savings and improved the allocation of investment funds. Without them, the resources required for rapid growth would have been lacking. In addition, wages and the cost of capital have been kept reasonably in line with relative factor scarcities.

Korea's experience with export-led industrial development has been striking not merely for the GNP growth rates achieved. Because it has been labor intensive, industrial development has produced rapid employment growth at the same time that labor productivity has risen, and the country does not have a serious long-term unemployment problem. The distribution of income is not markedly unequal. In fact, surveys reveal that in Korea the distribution of consumption expenditure among households tends to be more nearly equal than it is elsewhere in the world, and that this distribution does not appear to have deteriorated over time.[119] Exports have thus proved to be a powerful engine of economic growth and, because of their labor intensity,

have contributed greatly to rapid employment growth, which in turn has no doubt been a major factor in maintaining a relatively even distribution of consumption.

While Korea's successful development derives from its outward-looking strategy and the resulting process of export-led, labor-intensive industrialization, other factors have helped. The most obvious of these is the high level of foreign assistance, during the 1950s and early 1960s, which helped build the infrastructure for subsequent growth. Foreign capital inflows from all sources have continued to be substantial. Between 1960 and 1975, about 40 percent of total investment was financed from abroad. It should be emphasized that foreign capital inflows have been used efficiently: Korea's gross incremental capital-output ratio (around 2.4) is quite low compared with ratios in other developing countries. Moreover, it is important to bear in mind that the flows of private foreign capital to Korea since the mid-1960s have themselves been largely a response to the country's export performance.

Political factors made it possible to change policy in the early 1960s and to maintain sound policies thereafter. Since shortly after the overthrow of the Syngman Rhee regime, which was partly prompted by its economic mismanagement, Korea has had a strong government that is motivated and able to impose far-reaching economic policies, including frequent devaluations of the currency and tax measures that have kept government savings at high levels, except immediately after the rise in energy prices. Whenever the government has intervened in labor markets, it has generally been to counter organized labor, which as a result is not a powerful interest group. But, in the framework of free labor markets, wages have risen in response to labor market conditions, so that in the fifteen years after 1960 the average real wage in mining and manufacturing increased by 5.5 percent a year.

Also important were the "initial conditions" at the start of Korea's rapid industrialization. Assets were more evenly distributed and the population more highly educated than in most developing countries. Through parents' efforts, and despite the fact that public expenditures on education have been low by international standards, Korea has one of the highest literacy rates in the world and a very high proportion of secondary school and university graduates. The large investment in human capital has yielded a highly skilled labor force without great expenditure of public resources.

Various factors have contributed to Korea's successful development, but the key contribution has come from economic policies that have fostered what appears to be a reasonably efficient and equitable process of industrialization. Thus Korea provides an almost classic example of an economy following its comparative advantage and reaping the gains predicted by conventional economic theory.

Since Korean entrepreneurs first demonstrated their capacity to expand exports rapidly, there has been debate within the government between the advocates of an even more outward-looking, laissez-faire strategy and the supporters of increased government intervention. The latter tend to fall into one of two camps: those who believe it necessary for the government actively to promote new export lines in anticipation of Korea's shifting comparative advantage and in response to threatened or actual import restrictions in its major overseas markets; and those who believe the economy is too dependent upon exports. Neither of these opinions appears to have been justified by events since 1968. In respect of foreign exchange and trade, government intervention has, if anything, diminished over time. Yet Korean entrepreneurs have successfully developed major new export lines and have circumvented textile export quotas, which are specified in volume terms, by shifting toward higher quality, higher value added varieties. In turn, the Korean economy's performance during and immediately after the mid-1970s world recession was far better than that of most other developing economies and better than expected by the government.

A related question concerns the role of export targets in Korea's successful export performance. As noted previously, the government in 1962 established annual export targets based on a quarterly agenda and broken down in considerable detail by commodity, market, and exporting firm. Export targets have generally been met, and indeed surpassed, because the export promotion campaign has had high priority, as may be seen in the following. Since the inception of export targets, the minister of commerce and industry has maintained next to his office an "export situation" room laid out so that potential export shortfalls can be seen at a glance. A large staff keeps up almost daily contact with the major exporters, and it is not uncommon for the minister to intercede whenever difficulties arise in meeting targets. In addition, Korea's president receives monthly briefings regarding current export performance and prospects. The emphasis on export promotion is further evident in the system of classifying exporters begun in 1969. Exporters were graded into four classes on the basis of export performance, the highest export achievements bringing the national medal of honor, public presidential commendation, and more material benefits including relaxation of tax surveillance.

It would be naive to conclude that targets independently set by the government determined actual export levels, since the targets were meant to be indicative and as such were set jointly by the government and the

various exporters' associations. Furthermore, as noted, export targets were by and large surpassed, even when revised upward during the course of a year. Since both adequate export incentives and export targets were part of Korea's overall export promotion policy, it is impossible unambiguously to distinguish the effects of each, but it is clear that failure to provide adequate incentives would have severely retarded export growth. In this sense, export incentives were a necessary condition for Korea's phenomenal export performance. Were export targets also a necessary condition?

Evidence that export targets may have had a part in stimulating exports in some sectors comes from the effective incentive estimates for 1968. Several export sectors appear to have operated as cartels and, through protection, received higher incentives to sell on the domestic market than to export. Under the circumstances, exporting can of course be explained in terms of discriminating monopoly, but equally the government may have encouraged the formation of cartels in these industries to promote statically inefficient, nontraditional exports, by means of the export targeting system.[120] It also appears that rates of export subsidies such as the wastage allowance have sometimes been jointly negotiated between government and business simultaneously with export targets. But whether the sectors concerned would have exported less without export targets is a matter of speculation. In any event, these industries together accounted for no more than 20 percent of Korea's manufactured exports in 1968.

In the case of most exports, the targets merely complemented the incentives that had made rapid export growth possible. One important function of the export targeting system was to keep the government well informed about export performance so that timely changes could be made in incentives and, as often happened, ad hoc assistance could be given to individual exporters. The export targeting system and its trappings were also used to publicize the importance attached by the government to exports. Export incentives were well advertised and access to them was immediate. An atmosphere was thus created in which businessmen could be certain that the incentive system would reward efforts to export. Businessmen responded by taking the substantial risks of expanding production and capacity for export.

Notes to Chapter 8

1. See Table 8.14. The Standard International Trade Classification categories for manufactured exports are 5 through 8, except 68.

2. Bank of Korea, *National Income in Korea*, 1976.

3. The slow growth of real agricultural wages between 1970 and 1975 shown in Table 8.1 is both difficult to explain and a misleading indicator of the change in rural as against urban incomes. Other (reliable) data indicate that, if anything, average rural income increased relative to average urban income over this period. Before 1970, however, average rural income grew much less rapidly than average urban income.

4. For a more detailed discussion, see Charles R. Frank, Jr., Kwang Suk Kim, and Larry E. Westphal, *Foreign Trade Regimes and Economic Development: South Korea* (New York: National Bureau of Economic Research, 1975).

5. For comprehensive discussions of these policy reforms, see David C. Cole and Princeton N. Lyman, *Korean Development: The Interplay of Politics and Economics* (Cambridge, Mass.: Harvard University Press, 1971); and Gilbert T. Brown, *Korean Pricing Policies and Economic Development in the 1960s* (Baltimore, Md.: Johns Hopkins University Press, 1973).

6. A system of short- and medium-term indicative planning was instituted with the first five-year plan running from 1962 to 1967. For a description and evaluation of Korean planning, see Irma Adelman (ed.), *Practical Approaches to Development Planning: Korea's Second Five-Year Plan* (Baltimore, Md.: Johns Hopkins University Press, 1969); and Larry E. Westphal and Irma Adelman, "Reflections on the Political Economy of Planning: The Case of Korea," in *Basic Documents and Selected Papers of Korea's Third Five-Year Economic Development Plan (1972–1976)*, ed. S. H. Jo and S. Y. Park (Seoul: Sogang University, 1972).

7. Advance deposits on imports were made mandatory for a brief period during the exchange crisis in 1964 and were used continuously after the second half of 1968, when they were reintroduced in response to the rapid growth of import demand. Advance deposit requirements depended upon the source of the foreign exchange used, the country of origin, and the specific commodity being imported. They were changed frequently over time as the balance of payments situation fluctuated. During most of the period after 1968 there was no deposit requirement on most imports. Since the protection afforded was insignificant, we have neglected the protection equivalent of the advance deposit system in estimating both the effective exchange rate for imports and nominal protection rates in 1968.

8. The Ministry of Commerce and Industry administers the controls, designating prohibited and restricted commodities in a trade program that continues to be revised every six months. A license is required to import any of the restricted commodities, but not all such commodities are subject to strictly enforced quotas.

9. Until mid-1975 the Korean system employed outright tariff exemptions (for imports declared upon arrival to be for use in producing exports) rather than rebates (granted upon or after shipment of the exports). The subsidy is greater in the former case since the carrying cost of goods in process does not include interest on tariff charges.

10. Automatic tariff exemptions on imported capital goods were withdrawn in 1973, but many, if not most, exporters continued to benefit from administratively determined exemptions.

11. The real effective exchange rate for imports given here does not include the tariff equivalent of advance deposit requirements when these were in effect. In turn, the almost continuous fall in the actual tariff rate paid on imports is due to the rising share of tariff-exempt imports for use in export production, and not to a general lowering of legal tariff rates.

12. Until mid-1975 tariff exemptions were granted as imports for export production cleared customs. A switch was then made to a tariff rebate or drawback system under which tariffs on imports for export production are paid at the time of

importation and then rebated at the time of export. The impact of the change was greatly moderated, however, by the simultaneous introduction of provisions for deferred payment of customs duties by exporters. For details, see Larry E. Westphal, "Manufacturing," in *Korea: Policy Issues for Long-Term Development*, ed. Parvez Hasan and D.C. Rao (Baltimore, Md.: Johns Hopkins University Press, 1979).

13. Bela Balassa, *Policy Reform in Developing Countries* (London: Pergamon Press, 1977), chap. 8.

14. By giving annual averages of the official exchange rate, Table 8.3 makes it appear that devaluations occurred more frequently than they in fact did.

15. The special tariff system was abolished in 1973, when the so-called flexible tariff system was adopted, under which tariff rates can be administratively altered within the range of the legislated rate plus or minus 50 percentage points.

16. These price comparisons could not be used extensively in the present work because for many commodities they did not satisfy the criteria we had adopted.

17. The latter percentage includes exemptions for both export and import-substituting production. It is not possible to separate these.

18. Seung Yun Lee, *A Study of Price Comparisons between Domestic Producers' Unit Prices and International Prices* (Seoul: Sogang University, 1971). This survey was jointly financed by the Korea mission of the U. S. Agency for International Development and the Economic Planning Board, Republic of Korea, to both of which we are grateful.

19. Data for 1966 were used here because similar detailed data for 1968 were not available.

20. We had hoped to secure price comparisons for additional groups, but were unable to do so. Most groups for which price comparisons were lacking are excluded from the estimation of sectoral averages of nominal protection. If the commodity group for which price comparisons were lacking was exported in significant quantity and its imports were not restricted, this was considered sufficient evidence to set the nominal protection rate at zero. If there were substantial imports and no indications of effective import restrictions, this was considered sufficient evidence to use the legal tariff rate as an estimate of nominal protection.

21. This convention implies that nominal protection is equivalent, with respect to resource allocation, to an actual tariff rate, were it imposed at the same level. As Bhagwati has shown, this is not always true when markets are imperfect. The nominal rate tends to be greater than the equivalent tariff when domestic production or quotas are monopolized, which means that nominal protection rates in the Korean context may overestimate the protective effects of import controls in an equivalent-tariff sense. See Jagdish Bhagwati, "On the Equivalence of Tariffs and Quotas," in *Trade, Growth, and Balance of Payments: Essays in Honor of Gottfried Haberler*, ed. Robert E. Baldwin and others (Chicago: Rand McNally, 1965).

22. Larry E. Westphal and Kwang Suk Kim, *Industrial Policy and Development in Korea*, World Bank Staff Working Paper, no. 263 (Washington, D.C.: World Bank, 1977), annex table 1.

23. The actual tariff rate is defined as tariff collections on imports of the commodity group divided by the domestic currency equivalent of the value of total c.i.f. imports in the commodity group. A comparison of the actual and legal tariff rates indicates the extent of tariff exemptions (including reductions) on imports falling within the group.

24. The only sectors with more than 1 percent of total merchandise exports in 1968 that are not represented in the table are slaughtered and processed meat, rubber shoes (including canvas footwear), and electronic components. Exports of meat are largely processed sea urchins shipped to Japan. These exports should really have been classified elsewhere; the misclassification is present in the original input-output data. Because we did not obtain export prices for commodities within the latter two sectors, we omitted them from Table 8.5.

25. There are two exceptions—cotton jeans and photosensitive paper—for which the implicit tariff did not appear to be a valid measure.

26. The other such cases are synthetic dyes and rubber sulphuration agents.

27. Machinery and equipment comprises nonelectrical machinery, electrical machinery and equipment, and transport equipment. Some items falling outside industrial groups IX and X (see the section "Estimates of Effective Incentives, 1968") are included, for example, electrical consumer durables such as appliances and radios.

28. Based on Westphal and Kim, "Industrial Policy and Development in Korea," annex table 1.

29. For textile weaving machinery, this has since been confirmed by a formal investigation; see Yung W. Rhee and Larry E. Westphal, "A Micro, Econometric Investigation of Choice of Technology," *Journal of Development Economics*, vol. 4 (1977), pp. 205–37.

30. Sales on the unprotected market are intermediate deliveries in all other sectors, and thus an input-output matrix can be used to estimate the division of sales between the two markets. This method cannot be used for deliveries to final demand.

31. The weights used in averaging are the world-price values of domestic sales. The averages given here are conceptually different from those discussed in the next section. First, the underlying estimates here pertain to the protected domestic market only; second, the averages are here taken at the commodity, rather than the sectoral, level. For further details, see Westphal and Kim, "Industrial Policy and Development in Korea," sec. 2.5.

32. Red pepper is a major ingredient of *kimchi*, a cabbage-like preparation that is a staple in the Korean diet; it is also generously applied in almost all Korean cooking.

33. The last percentage cited is a biased estimate of the incidence of import controls relative to total domestic sales, because a commodity group's inclusion in the price comparison sample was based, in part, on the imposition of import restrictions.

34. Evidence is presented below to suggest that net effective subsidy rates on total sales by and large reflect comparative efficiency. Since the ranking of sectors according to effective subsidy rates is virtually the same whether or not adjustment is made for exchange rate overvaluation, unadjusted effective subsidy rates also indicate comparative (or relative) efficiency.

35. The 1966 input-output matrix was used to estimate inputs on the basis of 1968 production levels.

36. This no doubt results in an overestimate of the use of imported inputs in production for the domestic market and in an offsetting underestimate of their use in production for export.

37. Nominal protection on ginseng exports was negative, because of the implicit export tax, and indirect exports were assumed to receive negative nominal protection in sectors in which nominal protection on other domestic sales was negative.

38. The average tax rate (9.7 percent in 1968) is the total tax payments of all goods-producing sectors divided by their total

gross business income. It is the current-price value of tax receipts that is held constant to define the norm, rather than a constant-price value. The latter would reflect the change in prices of goods and services purchased by the government that would follow a shift to the free-trade regime presumed if world prices were used as the norm with respect to a neutral trade policy.

39. Again, the average is computed for the goods-producing sectors only. The average rate, omitting the implicit negative subsidies because of borrowing at very high rates on the unorganized money market, was 13.6 percent.

40. Value added so adjusted is an estimate of what value added in the sector would have been if there were no tax and credit preferences and if net factor returns were unaltered from their actual values under the incentive policies followed.

41. Recall that average legal and nominal protection rates on each sector's total sales include zero protection (except for ginseng) on direct and indirect (except where nominal protection was negative) export sales.

42. Negative value added in world prices gives rise to a negative effective incentive rate that is algebraically less than −100.0 percent. We consider that a sector having negative world-price value added receives more protection than a sector receiving *any* positive rate of protection on a positive world-price value added. For effective protection rates of less than −100.0 percent, the proper ranking from greatest to least protection is according to algebraic value. For example, the following hypothetical effective incentive rates are ranked from greatest to least protection: −100.1, −1,000.0, 1,000.0, and −99.9. It can be shown that this method of ranking is such that the rank of the weighted average of *any* two independent effective protection rates must lie between the ranks of these rates. Furthermore, it yields the inverse of a ranking by "benefit-cost" ratios, according to which benefits are measured by world-price value added and costs by value added in market factor prices.

43. Extreme observations have a negligible effect on the weighted averages shown in the other tables, for the weighting is by value added in world prices. In addition to having very low value added *coefficients*, almost all sectors at the extremes had relatively small sales volumes when measured in world prices.

44. The high effective subsidy rate on vegetables shown in Appendix Table 8.1 reflects the exceptionally high nominal protection rate on red pepper and undoubtedly misstates Korea's comparative efficiency in the production of most vegetables.

45. Forest products are classified as a non-import-competing sector in Appendix Table 8.1, but the sector is defined to include only forest products produced in Korea. Most roundwood imports do not compete with domestic production and are thus separately classified as noncompetitive imports in the underlying input-output data.

46. Here, as throughout the text, we include sectors having negative effective subsidy rates algebraically less than −100 percent among those having positive protection.

47. Nominal input protection refers to the weighted average of the nominal protection rates on a sector's inputs, the weights being proportional to the value (at world prices) of the inputs used.

48. A very large integrated iron and steel mill has started operation since 1968.

49. A complete list of incentives for import-substituting production is given in Kwang Suk Kim, "Trade and Industrial Policy in Korea, 1945–1970" (Seoul: Korea Development Institute, 1971; processed).

50. In this case it was argued that preferential interest rates were required to offset the competitive advantage of imported machinery financed through low-interest suppliers' credits.

51. Interest subsidies on foreign loans made up 43 percent of total interest subsidies, while those on domestic loans not explicitly related to export activity made up 34 percent.

52. David C. Cole and Larry E. Westphal, "The Contribution of Exports to Employment in Korea," in *Trade and Development in Korea*, ed. Wontack Hong and Anne O. Krueger (Seoul: Korea Development Institute, 1975).

53. Effective incentive rates on the protected domestic market were of course somewhat higher than those on total domestic sales; the latter are, as previously noted, weighted averages of the effective incentive rates on indirect exports and on protected domestic sales.

54. A procedure analogous to that employed for direct tax and credit preferences was used to estimate the incentive effects of overhead rate reductions. The norm for calculating world-price value added assumes that all sectors paid the same average rates on inputs of each overhead service, the average rates being calculated to hold each overhead sector's total receipts constant. In the case of electricity, we estimated that total rate reductions amounted to 1.81 percent of total actual charges. The comparable figure for transport was 0.66 percent.

55. The prices paid by exporters for domestically produced intermediate inputs (that is, indirect exports) could not exceed c.i.f. world prices, since exporters could import their tradeable intermediate inputs free of indirect taxes and tariffs. Exporters would pay domestic, as distinct from world, prices for intermediate inputs only when these were below world prices. For ease of exposition, we shall refer to the purchase of domestically produced inputs at domestic prices less than world prices as a subsidy element, although it need not be an explicitly conceived subsidy to exports.

56. There were no tariff and indirect tax exemptions on intermediate inputs used to produce nontradeable goods sold to exporters. Overhead rate reductions partly compensated for the tariffs and indirect taxes reflected in the normal charges for these inputs, but they were not given uniformly to all exporters.

57. Included among these sectors are the eighteen for which sector indexes appear in the listing of export and XIC goods in Table 8.5, plus slaughtered and processed meat (14), rubber shoes (106), and electronic components (124).

58. See Westphal and Kim, "Industrial Policy and Development in Korea," pp. 3-42 to 3-44, for further discussion.

59. Because of nontradeable intermediate inputs and export incentives, value added in exports measured in producers' prices may be positive or negative irrespective of algebraic sign when measured in world prices. In turn, the world-price value added coefficients for exports and for domestic sales are not equal because of the difference between c.i.f. and f.o.b. prices. The sectors are indicated in Westphal and Kim, "Industrial Policy and Development in Korea," pp. 3-46 to 3-48.

60. If *both* producer-price and world-price value added are negative, a positive effective incentive rate, as conventionally calculated, indicates that value added at producers' prices is algebraically less than that at world prices and a negative rate indicates the opposite. Thus, when both estimates of value added are negative, the sign of the effective incentive rate must be reversed to give the correct indication of the effect of incentives on the algebraic magnitude of value added. In Tables 8.7 and 8.12 we have therefore reversed the sign of the effective incentive rate under the Balassa convention on transport equip-

ment exports, which consisted primarily of motor vehicle parts and components. At the same time, in conducting correlation analyses using effective incentive rates (see Tables 8.9 and 8.25), we have first reversed the signs when both producer- and world-price value added are negative. In Appendix Table 8.1 the signs of the effective incentive rates are the same as those given by the conventional calculation so as to allow the computation of proper weighted averages. No adjustments had to be made to effective incentive rates on domestic or total sales, since the corresponding producer-price value added estimates were positive in every sector.

61. The effective protection rates on aggregate domestic sales and exports in 1968 were 10.5 and 0.4 percent, respectively. The corresponding effective subsidy rates were 10.1 and 8.6 percent. Recall that the weighted average of the effective incentive rates on aggregate domestic plus export sales must remain constant in the changeover from the protection to the subsidy definition. The rather small change in the effective incentive rate on domestic sales is explained by the relatively small weight of exports. Furthermore, it conceals two offsetting changes: The effective incentive rate on indirect exports rises, whereas that on sales in the protected domestic market falls, upon the inclusion of credit and income tax preferences.

62. The ratio of exports to protected domestic sales tended to be much higher among the type E products than among the type D products. The exceptions were other fabrics, knit products, wigs, and electronic components. Apart from these, every type D product had a significantly lower ratio of exports to protected domestic sales than did every type E product. See Westphal and Kim, "Industrial Policy and Development in Korea," annex table 2.C.

63. Legal tariffs on type E products were generally as high as those on type D products, but very little of the potential protection on type E products was realized.

64. Wigs are an exception among the type D products. Inputs for exports of wigs were not subsidized; a wastage allowance subsidy on imported hair would have been valueless since there were almost no wig sales on the domestic market, which in any event was not protected. The apparent slight bias in favor of sales on the domestic market is the result of our having used the f.o.b. sales price to compute effective incentives on wig exports and the c.i.f. price to compute domestic sales. The effective subsidy rate on domestic sales of wigs was −7,392 percent, which can be traced to the very small difference between the coefficients for world- and producer-price value added and the absence of any credit preferences. Since there were almost no domestic sales, this estimate should be disregarded and effective protection rates used instead.

65. There is probably aggregation bias with respect to electronic components. The components that were being exported—sophisticated elements of microcircuitry assembled from imported subcomponents—had a very small share in domestic sales. Our nominal protection estimates pertain to the type having a larger share in the domestic market.

66. Production appears to have been comparatively efficient in almost all sectors producing primary exports, chiefly minerals, and in all sectors processing food for export. The XIC sectors that appear to have been low-cost sources of exports include nonferrous metal primary products, household metal products, toys and sporting goods, and personal accessories. The high-cost export sectors were, for the most part, among those not long established as import-substituting sectors; they include silk fabrics, office and service machines, transformers, household electronic equipment (radios and the like), and prime movers.

67. For evidence from a highly detailed investigation of the cotton weaving industry, see Rhee and Westphal, "A Micro, Econometric Investigation of Choice of Technology."

68. A detailed discussion of elasticity estimates for Korea is given in Frank, Kim, and Westphal, *Foreign Trade Regimes and Economic Development: South Korea*, chaps. 6 and 8. Our data base is identical, but we have used slightly different estimating equations. The estimates in Frank, Kim, and Westphal are, in general, lower than those used here.

69. The application of this approach to the individual import categories before aggregation led to an unreasonably high estimate of the demand elasticity for total imports, owing to the very small share of consumer goods imports that were unrestricted. Adjustment of the aggregate elasticity makes the final estimate less sensitive to errors at the disaggregated level.

70. For the relevant formula and a discussion of its application, see Bela Balassa and Associates, *The Structure of Protection in Developing Countries* (Baltimore, Md.: Johns Hopkins University Press, 1971), app. A.

71. Ibid.

72. See Cole and Lyman, *Korean Development: The Interplay of Politics and Economics*; Brown, *Korean Pricing Policies and Economic Development in the 1960s*; and Frank, Kim, and Westphal, *Foreign Trade Regimes and Economic Development: South Korea*.

73. Orville John McDiarmid, *Unskilled Labor for Development: Its Economic Cost* (Baltimore, Md.: Johns Hopkins University Press, 1977).

74. Korea's agricultural performance is analyzed in Cole and Lyman, *Korean Development: The Interplay of Politics and Economics*, pt. 2; Paul W. Kuznets, *Economic Growth and Structure in the Republic of Korea* (New Haven: Yale University Press, 1977), chap. 5; and Gustav Ranis, "The Role of the Industrial Sector in Korea's Transition to Economic Maturity," paper presented to the ILCORK (International Liaison Committee of Research in Korea) Conference on Industrialization in Korea, Seoul, 1971. Ranis takes a strong dissenting position, arguing that the sector's performance has been seriously retarded by suboptimal balance in the government's allocation of resources between industry and agriculture. He argues, for example, that agricultural price policies have in the past been aimed at improving income redistribution rather than toward providing incentives for increased output, and that, by comparison with Taiwan and Japan, insufficient resources have been directed to improving rural infrastructure (including marketing and credit facilities) and to the development and diffusion of new technologies. Ranis fails to provide hard evidence, however, that the rate of return to further investment in agriculture and its supporting infrastructure is higher than the marginal rate of return to investment in industry. Other observers would agree that the government's agricultural policies could have been improved, but would dispute that large gains in national income would have resulted.

75. One must also add that inputs to export activity could be imported free of tariffs and taxes and that there were no indirect taxes on export sales.

76. Receipts from government transactions peaked in 1969, at slightly more than US$275 million, when military-related expenditures were almost US$120 million, the largest amount they had ever reached. Offshore procurement in Korea for the Vietnam War achieved its highest level, US$64 million, in 1971.

77. Legislation controlling nongrant foreign capital inflows was first passed in 1960; it made all foreign loans and investment proposals subject to government approval by a commit-

tee chaired by the minister of the Economic Planning Board. (A similar mechanism had earlier governed the allocation of grant assistance; however, it was not as directly tied to formal planning activity.) Preferences, including a rather standard package of tax concessions for direct foreign investment, were simultaneously established to stimulate the inflow of foreign capital and technology, and in 1966 limits on equity investment and profit remittances by foreign investors were completely removed. The relatively small volume of direct foreign investment in Korea during the 1960s is commonly explained either by the uncertainties of the political situation or, more plausibly, by purposeful administrative tactics that were apparently relaxed in the early 1970s; it was not due to the lack of legislated inducements.

78. The ratio of imports minus exports to investment averaged 56.4 percent between 1955 and 1975; the ratio of this difference to GNP averaged 9.6 percent. During the 1950s and early 1960s, Korea's continuing trade deficit was almost wholly financed by grant aid from the United Nations and the United States. Foreign borrowing did not become important until the mid-1960s, but once started it assumed large proportions. In 1966, on an arrivals basis, official grants were about equal in volume to foreign loans; by 1970 the volume of foreign loans was more than five times the size of the grants, while less than half the loan arrivals were from government and multilateral sources. Most private foreign loans flowing into Korea have come from Japan, the United States, and Western Europe; many, but by no means all, have been suppliers' credits of one form or another. For further information, see Frank, Kim, and Westphal, *Foreign Trade Regimes and Economic Development: South Korea*, chap. 7.

79. Benjamin I. Cohen, "Comparative Behavior of Foreign and Domestic Export Firms in a Developing Economy," *Review of Economics and Statistics*, vol. 60 (1973), pp. 190–97.

80. The foregoing information on direct foreign capital inflows is based on Frank, Kim, and Westphal, *Foreign Trade Regimes and Economic Development: South Korea*; and Parvez Hasan, *Korea: Problems and Issues in a Rapidly Growing Economy* (Baltimore, Md.: Johns Hopkins University Press, 1976); as well as various statistical publications of the Bank of Korea and the Economic Planning Board.

81. Figures in 1973 dollars from Boum Jong Choe, "An Economic Study of the Masan Free Trade Zone," in Hong and Krueger, *Trade and Development in Korea*.

82. Cohen surveyed exporters of transistors, radios, cotton cloth, cotton yarn, baseball gloves, and wigs and found that Korean companies had begun exporting five of these six products before the arrival of foreign firms. See Cohen, "Comparative Behavior of Foreign and Domestic Export Firms in a Developing Economy."

83. Sang Chul Suh, "Development of a New Industry through Exports: The Electronics Industry in Korea," in Hong and Krueger, *Trade and Development in Korea*.

84. For a survey of what is known in these respects, see Larry E. Westphal, Yung W. Rhee, and Garry Pursell, *Korean Industrial Competence: Where It Came From*, World Bank Staff Working Paper, no. 469 (Washington, D.C.: World Bank, 1981).

85. The 1955 input-output table was compiled under the supervision of Se Min Oh, chief, Input-Output Research Section, Bank of Korea, and was financed by grants from the University Committee on Research in the Humanities and Social Sciences and the Council on International and Regional Studies, Princeton University. The tables for the other years were published in 1970 in processed form by the Bank of Korea in its *Working Report on the 1968 Input-Output Table*. The published tables distinguish between competitive and noncompetitive imports; the former are defined as imports of items that are produced domestically, and the latter as imports of items not produced in Korea in the year for which the table has been compiled. The list of items classed as noncompetitive changes from table to table. Failure to adjust the statistics for each year to a common list of noncompetitive imports leads to a severe understatement of the amount of import substitution that has taken place, since much of Korea's import substitution is the result of introducing the production of formerly noncompetitive imports (such as petroleum products). We have adjusted the data so that virtually all imports are treated as competitive. See Larry E. Westphal and Kyu Soo Kim, "The KDI Input-Output Data Bank" (Seoul: Korea Development Institute, 1977; processed), annex 3, "Reclassification of Noncompetitive Imports."

86. Westphal and Kim (ibid., annex 5, "Deflation of Input-Output Accounts to Constant Domestic and World Market Prices") describe the deflation procedure in detail. This annex also indicates how independent statistical series (such as national income accounts, various price indexes, and the index of manufacturing output) can be systematically "filtered" through a time series of input-output statistics to check the consistency of a large body of economic data for a particular country. It further provides an extrapolation back in time of an index of nominal protection based on the 1968 nominal protection rates and observed changes in domestic prices relative to export and import prices.

87. Nominal rates of protection for 1965 were estimated by extrapolating those for 1968 back to 1965 using domestic- and world-price indexes. See ibid.

88. Little, Scitovsky, and Scott, and Balassa and Associates found that measuring aggregate growth at constant world rather than domestic prices substantially lowers growth rates for many countries. This results from a positive correlation across sectors between protection and growth rates. These authors examine GDP growth rates rather than total commodity output growth rates and use effective protection measures for a single year to deflate value added to constant world prices, rather than using nominal protection measures for a single year to deflate output; otherwise the calculations are quite similar. See Ian M. D. Little, Tibor Scitovsky, and Maurice Scott, *Industry and Trade in Some Developing Countries: A Comparative Study* (London: Oxford University Press, 1970), pp. 70–76; and Balassa and Associates, *Structure of Protection in Developing Countries*, pp. 32–34.

89. The contribution of the primary sectors to the growth of total output of goods between 1955 and 1968 was 26.3 percent in constant domestic prices and 25.0 percent in constant world prices.

90. In 1960 and 1968 the shares of agriculture, forestry, and fishing in total output, imports, and consumption were affected by poor weather; their shares in total consumption were limited by quantitative controls on imports. The shares in the two years are nonetheless comparable with one another.

91. A significantly greater share of primary production was exported in 1968 than in 1955.

92. The average absolute percentage change in the shares of industrial groups II through X, excluding IV, in the total domestic demand for manufactures between 1960 and 1968 was 3.5 percent. The comparable figure for production shares was 2.7.

93. Hollis B. Chenery, S. Shishido, and T. Watanabe, "The Pattern of Japanese Growth, 1914–1954," *Econometrica*, vol. 30 (1962), pp. 98–139.

94. Our approach is closest to that employed by Lewis and

Soligo, who define import substitution in relation to total demand, including exports. Their specification is appropriate if the level of aggregation is such that the same sector includes both imports of intermediate inputs and the associated exports of higher-stage products. Since we are working with highly disaggregated data, however, their specification is not appropriate for our purposes. See Stephen R. Lewis, Jr., and Ronald Soligo, "Growth and Structural Changes in Pakistan's Manufacturing Industry, 1954–1964," *Pakistan Development Review*, vol. 5 (1965), pp. 94–139.

95. See George Fane, "Import Substitution and Export Expansion: Their Measurement and Example of Their Application," *Pakistan Development Review*, vol. 11 (1971), pp. 1–17.

96. Details regarding the computation of total growth contributions are given in Westphal and Kim, "Industrial Policy and Development in Korea," pp. 4–31 ff.

97. These estimates are taken from data underlying the computation of the growth contributions and do not appear in the tables.

98. Suk Tai Suh, "Import Substitution and Economic Development in Korea," Korea Development Institute Working Paper, no. 7519 (Seoul, 1975).

99. In Korean parlance, the heavy industrial sectors comprise nonelectrical and electrical machinery as well as transport equipment and basic intermediate products. They thus include such products as precision instruments and electronics.

100. See Frank, Kim, and Westphal, *Foreign Trade Regimes and Economic Development: South Korea*, pp. 81 ff.

101. Larry E. Westphal, "The Republic of Korea's Experience with Export-Led Industrial Development," *World Development*, vol. 6 (1978), pp. 362–63.

102. The potential gains from following such an investment pattern are documented using a planning model in Larry E. Westphal, "An Intertemporal Planning Model Featuring Economies of Scale," in *Studies in Development Planning*, ed. Hollis B. Chenery and others (Cambridge, Mass.: Harvard University Press, 1971).

103. Wassily Leontief, "Domestic Production and Foreign Trade: The American Capital Position Re-examined," *Economica Internazionale*, vol. 7 (1954), pp. 9–38.

104. The import bundles for which input coefficients were calculated include almost all the items considered in the original input-output tables to be noncompetitive imports. (See note 85 for details regarding our adjustment of the import data.) We experimented with other ways of handling these imports and found that the fundamental conclusions were not sensitive to the procedure employed.

105. Calculations of the factor intensity of exports based on the input-output coefficient matrix for domestically produced inputs alone are given in Wontack Hong, *Factor Supply and Factor Intensity of Trade in Korea* (Seoul: Korea Development Institute, 1976). Hong in addition assumes that sectoral factor input coefficients taken from U.S. data are relevant to the production of what the original input-output tables consider to be noncompetitive imports. His results concerning the relative factor intensities of exports and imports are briefly discussed in the text below.

106. Ibid.

107. See Young Chin Kim and Jene K. Kwon, "The Utilization of Capital and the Growth of Output in a Developing Economy: Case of South Korean Manufacturing Industry, 1962–1971" (Dekalb, Ill.: Northern Illinois University Department of Economics, 1976), table 2, U_1 series.

108. Hong, *Factor Supply and Factor Intensity of Trade in Korea*.

109. For a detailed discussion of the issues involved in making such comparisons, see Stephen E. Guisinger, "The Theory and Measurement of Effective Protection: The Case of Pakistan," Ph.D dissertation, Harvard University, Cambridge, Mass., 1970.

110. This consideration, no doubt, also explains why we were unable to discover any significant relation between various possible measures of the incentive bias toward or against exports on the one hand and export shares or export growth contributions on the other.

111. See Bela Balassa, "Industrial Policies in Taiwan and Korea," *Weltwirtschaftliches Archiv*, vol. 105, no. 1 (1971), pp. 55–77.

112. Most of these are crude efforts focused on the correlation between real exports and the real effective exchange rate for exports. The time-series correlation may be nil even though the two variables are significantly related, for the implicit model is not correctly specified. Thus, for an economy in dynamic equilibrium, with the real exchange rate maintained at its appropriate level, real exports would continue growing even were the appropriate real exchange rate constant over time. This factor is partially reflected in the test by Frank, Kim, and Westphal, *Foreign Trade Regimes and Economic Development: South Korea*, since they include real nonagricultural output in the regression. In turn, one would expect lagged responses to the removal of trade distortions to undermine the efficacy of even this formulation, particularly if the real exchange rate remains constant after the removal of trade distortions.

113. Ibid., pp. 85–86.

114. Ibid., chaps. 8 and 9.

115. This has been thoroughly documented for textile weaving machinery in Rhee and Westphal, "A Micro, Econometric Investigation of Choice of Technology."

116. Frank, Kim, and Westphal, *Foreign Trade Regimes and Economic Development: South Korea*, chap. 7.

117. The relatively high net effective subsidy rate (15 percent) on total machinery sales in 1968 did not apply to all types of machinery. In particular, negative rates applied to certain nonelectrical machinery that had been produced in volume over a relatively long time, including metal-working, mining and construction, and textile machinery.

118. Norton makes the same argument. See Roger D. Norton, "The South Korean Economy in the 1960s" (Washington, D. C.: World Bank Development Research Center, 1971; processed).

119. See Frank, Kim, and Westphal, *Foreign Trade Regimes and Economic Development: South Korea*, chap. 11, for details regarding this and the following points. Adelman and Renaud survey the evidence regarding Korea's income distribution in detail. See Irma Adelman, "South Korea," in *Redistribution with Growth*, ed. Hollis B. Chenery and others (London: Oxford University Press, 1974); and Bertrand Renaud, *Economic Growth and Income Inequality in Korea*, World Bank Staff Working Paper, no. 240 (Washington, D.C.: World Bank, 1976).

120. On the distinction between static and dynamic comparative advantage, see Hollis B. Chenery, "Comparative Advantage and Development Policy," in *Structural Change and Development Policy* (New York: Oxford University Press, 1979), pp. 272–308.

9

Singapore

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Singapore is a city-state located on a small island at the southern tip of the peninsula of West Malaysia. It has a land area of approximately 618 square kilometers and possesses no natural resources other than an excellent deep-water harbor. Modern Singapore was founded in 1819 because of its strategic location and natural harbor—factors that bestowed advantages on its entrepot trade. This entrepot trade comprised the import and reexport of primary products from neighboring Southeast Asian countries to Europe, the United States, and other parts of the world, after grading, processing, and repacking, and the import and reexport of manufactured goods from the industrial countries to the Asian neighbors.

From its establishment in 1819 until World War II, Singapore's response to the ebb and flow of entrepot trade, on which its economic life depended, was a simple one. When business slackened, the population declined because the Chinese went back to China and the Indians to India. After World War II, however, return to China became impossible, and Singapore's migrant population began to sink its roots permanently. World economic misfortunes then struck a blow at the standard of living and employment.

The problem of unemployment was compounded by the fact that Singapore's population had expanded very rapidly in the postwar period up to 1957. The average annual rate of increase between the census years of 1947 and 1957 was 4.3 percent, of which 3.6 percent was a natural increase and 0.7 percent was due to migration, mainly from West Malaysia. By 1957, 42.8 percent of the population was below fifteen years of age. In that year 24,000 persons were unemployed, and by 1960 the rate of unemployment in the working age population had reached 13.5 percent.

By 1960 most countries in the region were increasingly trading directly with the countries using their raw materials and had begun to develop their own manufacturing industries. Thus, Singapore recognized that entrepot trade was not capable of generating the significant increases in employment and production that were necessary for its further economic development.

Incentives to Industrialization: A Historical Perspective

The solution was said to be industrialization. The 1959 election manifesto of the People's Action Party (PAP), which has held power ever since, listed Singapore's four advantages and four weaknesses for industrialization.[1] The four advantages were: hardworking, resourceful, and enterprising people; a central geographical position and excellent sea communications; a substantial amount of capital accumulated by local concerns and public authorities; and relatively large markets in the region. The four weaknesses were: free-port status, which was deemed to be disadvantageous to industrialization; lack of free access to the markets of the Federation of Malaya; inadequate numbers of technical personnel, managerial staff, foremen, and skilled workers; and orientation on the part of entrepreneurs toward trading rather than manufacturing.

At the time the manifesto was published, Singapore had a modern but small manufacturing sector that was providing direct employment for 27,000 persons. The

manufacturing sector produced mainly light consumer goods, especially processed food and tobacco, intermediate inputs such as glass containers and cans for the food industries, and building and structural materials required by the city's construction industry. To bring about the required industrialization program, the manifesto emphasized the need to establish a common market with the Federation of Malaya, improve the technological base of industry, encourage foreign business concerns, and shelter selected new industries under tariffs and quotas.

Pre-Malaysia: 1959–63

Upon assuming office, the PAP government launched the industrialization program by enacting the Pioneer Industries (Relief from Income Tax) Ordinance, the Industrial Expansion (Relief from Income Tax) Ordinance, and the Control of Manufacture Ordinance. In 1961 the government published the 1961–64 development plan and established the Economic Development Board (EDB). The basic strategy was to give incentives to private capital for establishing industries in Singapore. The government's task was to create suitable infrastructure and inducements for private enterprise.

The Pioneer Industries Ordinance of 1959 was designed to promote the establishment of new companies catering to the home market or the export market. Such companies were granted relief from the prevailing 40 percent company profits tax for a period of five years from the date on which production of marketable quantities began. Losses during the exemption period could be carried over, to be set against profits in later years. In addition, depreciation allowances could be written off against profits in succeeding years.

The Industrial Expansion Ordinance of 1959 gave tax relief to certain existing manufacturers who were expanding the production of approved products. The relief was for a period of five years and was administered on a sliding scale, depending on the amount of new capital invested. For a minimum outlay of 10,000 Singapore dollars (S$) the tax concession (the untaxed portion of the rate of profit) was 11 percent a year; it rose by 1 percent for each S$10,000 of additional capital outlay, reaching a maximum of 15 percent for amounts of S$50,000 and more.

The Control of Manufacture Ordinance of 1959 appointed a registrar of manufacturers to limit the number of industrial enterprises producing certain goods specified by the minister of finance. This action was designed to prevent excessive competition and duplication in production for domestic markets, but later became unnecessary when an export orientation strategy was adopted.

The EDB made available to investors factory sites for rental or purchase within industrial estates established for the purpose. Of these, Jurong Industrial Estate was the largest; it was equipped with roads and railway communications, deep-water and coastal wharves, electricity and water supply, bulk handling facilities, and standard factories built for light industrial enterprises.

The board was empowered to extend medium- and long-term loans as well as equity financing to industrial enterprises, and to provide short-term loans to small enterprises that found it difficult to obtain bank financing. The rate of interest charged on loans varied between 6 and 8 percent a year. At the same time, by demonstrating its confidence in the viability of the enterprises it was in part financing, the board sought to attract additional private capital into manufacturing, especially from the commercial sector.

The EDB gave technical assistance to industries, which included feasibility and market studies, industrial research and the establishment of standards, technical and managerial training, and, to a limited extent, assistance with product development and industrial design. The EDB also set up training schemes in collaboration with industry, established vocational training schools and the Singapore Polytechnic Institute, and subsequently held workshops with the aid of U.N. agencies.

To provide further advantages to domestic industries, government departments were instructed to buy from domestic producers whenever possible, provided their prices did not exceed those of comparable imports by more than 10 percent. Although revenue duties had previously been levied on liquor, tobacco, and petroleum, protective tariffs were introduced in 1960 on imports of hard soap and detergents and in 1962 on paints to promote industrialization.

Quantitative import restrictions for protective purposes were first instituted in 1963 with the imposition of quotas on imports of flashlights and radio batteries, monosodium glutamate, and wheat flour. An official statement on the use of protective quotas in Singapore noted:

> In pursuance of the policy of providing protection to industries in Singapore, the import of a number of goods which were in various stages of manufacture locally or which were likely to be manufactured in the near future, was made subject to special licensing and/or quota restrictions. The need for this control on the import of each commodity was reviewed once in every six months from the date it was first enforced and decisions made in such reviews were announced quarterly. Where the particular industry had fairly found its feet but still needed some protection, the form of protection was modified by

> either changing the quota or by replacing it by tariffs. In other cases, where the particular industry was found not making any serious effort to succeed in its ventures, import quota protection was withdrawn. Quotas were also removed when industries were able to function without further protection from Government.[2]

The Malaysian Years: 1964–65

Establishing a common market was the main aim of the PAP government in seeking political merger with the Federation of Malaya. Merger with Malaya in 1963, however, never brought the common market into being. In retrospect, this turned out to be a blessing in disguise, because Singapore was subsequently forced to adopt an export-oriented development strategy.

During the brief years of Singapore's membership in Malaysia, no new protective tariffs were imposed. In November 1964, however, revenue duties were imposed on various petroleum products, sugar, confectionery, and sugar substitutes. In addition, duties on alcoholic beverages and tobacco were increased.

Up to May 1965, 230 commodities were made subject to import licensing and quantitative restrictions. The quotas generally amounted to 100 percent of the volume of imports in the preceding year. After the separation of Singapore from Malaysia on August 9, 1965, however, the Singapore government removed import restrictions from all but 88 commodities. Quotas were imposed in cases where domestic industries were deemed to face "unfair" competition from imported products, or if there was evidence of speculative imports and hoarding. Officially regarded as a temporary device, quotas were reviewed periodically and were replaced ultimately by import duties.

In 1965, eight shipyards and three industrial firms were given permission to import paints duty free. In addition, domestic industries were granted duty exemption on imported materials for which suitable local substitutes were not available. Among the goods exempted were leather, foam rubber, plastic materials, rubber compounds, empty glass containers, and polythene bags.

The Import-Substitution Phase: 1965–67

On August 9, 1965, independent Singapore was born into a highly uncertain world. Hitherto, industrial development had been guided by the hope that a common market would eventually be established with Malaysia. The lack of natural resources, insufficient potable water, and reliance on the British for defense reinforced the sense of loss of a potential hinterland and dependable market. The government's reaction was to protect the domestic market. Between August and December 1965, protective duties were imposed on 183 commodities such as electric filament tubes, rubber tires and products, milk, building materials, plastic articles, leather, glassware, footwear, and household appliances. The number of dutiable items increased to 199 in 1966, to 229 in 1967, 295 in 1968, and 398 in 1969.

Import substitution in the small home market was thus being pursued. The incidence of import quotas, however, was reduced from 88 commodities in August 1965 to 72 in 1967 and to 26 in 1969. Some of these quotas were abolished and others were replaced by tariffs, which remained generally low compared with those of other developing countries.

Since import barriers hinder entrepot trade, the Free Trade Zones Act was enacted in August 1966 to establish free-trade zones where entrepot and transit trade could be conducted without customs formalities. Within the free-trade zones, facilities were provided for the storage of goods and some further processing.

Toward Export Orientation: 1967–69

The British government first set military withdrawal for the mid-1970s, but later advanced the date to the end of 1971. The withdrawal was as great a shock in economic terms as in defense terms. In 1965 British military expenditure accounted for 17.6 percent of Singapore's GDP, and military spending was directly and indirectly responsible for perhaps 20 percent of employment in Singapore.

The government's response to the economic shock was to increase economic incentives and to tighten industrial discipline. Its Economic Expansion Incentives (Relief from Income Tax) Act of 1967 included the following measures: First, the tax rate on profits earned by approved manufacturing companies from exports was reduced from 40 percent to 4 percent. The concession could be granted for up to fifteen years. Second, in approved cases, the tax on royalties, licenses, and technical assistance fees and on contributions to research and development costs payable to overseas enterprises from Singapore plants was reduced to 20 percent. Complete tax exemption could be granted in special cases, particularly if the foreign recipient used such payments for equity financing of manufacturing industries in Singapore. Third, complete tax exemption was granted on interest received by overseas enterprises or individuals on approved loans to Singapore enterprises for the purchase of capital equipment. Tax on interest earned from deposits in Singapore banks by nonresidents was reduced to 10 percent.

The export incentives provided by the new act gave

exporters easier access to duty-free inputs, and reinforced the tax allowances for market development expenditures that had been granted under the Income Tax (Amendment) Act of 1965 and increased in 1966. Since 1966 approved enterprises have been allowed to make double deductions from taxable income to cover increases in advertising expenditures and other outlays designed to widen the markets for their products.

The Employment Act of 1968 and the Industrial Relations (Amendment) Act of 1968 had two objectives. One was to give greater discretion to employers in the development of their work force. Decisions on promotions, internal transfer, hiring, and dismissal were to be taken without recourse to collective bargaining. The other aim was to reduce labor costs by limiting the sums payable on bonuses, annual paid leave, retrenchment benefits, retirement benefits, and overtime, as well as by increasing the hours of work per week.

Toward Higher Technology: 1970–73

During the late 1960s and early 1970s there were two important shifts in Singapore's industrial development strategy. One was the change from import substitution under protective tariffs and quotas to export-oriented industrialization in the late 1960s. The other consisted of measures introduced in the early 1970s to attract higher technology industries that cater to regional and world markets.

Reductions before 1969 had lowered the number of items subject to tariffs to 398. This was reduced to 388 in 1970, 352 in 1971, and 346 in 1972. In 1973, in a move to curb inflation, the number of tariffs was again reduced to 197. The incidence of import quotas was reduced from 26 items in 1969 to only 3 in 1973. In turn, as noted above, export incentives were provided.

During the 1960s a large number of multinational companies set up manufacturing and distributional facilities in Singapore. They manufactured finished products, parts and components for supplying parent companies and subsidiaries elsewhere, capital equipment, intermediate products, and chemicals for offshore oil exploration and for natural-resource-using industries. Some companies found Singapore useful as an investment base for launching operations in other Asian countries, while others used it as a center for the development of professional services to meet regional needs. In 1971 foreign firms accounted for 26 percent of all firms, 63 percent of employment, 75 percent of total value added, and almost 75 percent of manufacturing exports excluding reexports.

By about 1970 Singapore had substantially overcome the problem of unemployment, and the accelerated withdrawal of British military forces was being accommodated more easily than had been anticipated. The unemployment rate in 1970 was 6.0 percent; it fell to 4.8 percent in 1971 and to 4.5 percent in 1973, and during those years probably represented primarily frictional rather than structural unemployment.

The easing of unemployment and larger manpower requirements for national service, together with the decreasing inflow of immigrant workers, marked the end of the period of surplus labor absorption by low-technology, labor-intensive industries. Thenceforth, the emphasis was to be on selectivity to attract high-technology industries. The 1970 Economic Expansion Incentives (Relief from Income Tax) Amendment Act raised the amount of capital necessary for acquiring pioneer status to S$1 million for new firms and to S$10 million for the expansion of existing firms. To encourage exports further, a tax exemption of up to 90 percent of the increase in export profits could be given for five years to nonpioneer and for ten years to pioneer firms whose exports exceeded S$100,000 and accounted for at least 20 percent of their sales. To encourage large-scale enterprises, firms with fixed assets in excess of S$150 million could be exempted from income tax for up to fifteen years.

Higher technology meant higher technical skills. Early projections of skill requirements at various levels indicated that there would be serious shortages of skills in the future. The response was to liberalize immigration, to encourage on-the-job training, and to revamp the educational system. In addition, the EDB supervised overseas industrial training schemes, joint government-industry training centers, and local industrial training grants. Of particular interest are the joint government-industry training centers such as those of Tata and Rollei. The Rollei Training Center provides instruction in precision mechanics, tool and diemaking, and precision optics for two years. These training centers have agreed to train twice their own manpower requirements for the benefit of other industries in Singapore.

Modifications in formal education began with the establishment of the Technical Education Department in June 1968. Secondary education curriculums and structure were revised in 1969 to provide a technical bias for pupils in secondary school, and courses at university level were also redesigned to train more students in engineering, accounting, and business administration.

Estimates of Nominal Protection

This section deals with the measurement and evaluation of nominal protection in Singapore as the first step toward quantifying the impact of the government's in-

centive policies on economic activities. Given the relative unimportance of primary activities in Singapore, the study is limited to the manufacturing sector. The calculation was done only for 1967 because of the large amount of data required and because the only available input-output table on Singapore's economy relates to this year.[3] In addition, import quotas began to be replaced by tariffs, and export subsidies were introduced in 1967.

After Singapore became an independent nation in August 1965, the number of items placed under tariff protection increased rapidly, partly because the abolition of the Malaysian Common Market made it necessary to protect the domestic market—Singapore's industrialization was then still based on import substitution[4]—and partly because of the tariff war between Singapore and Malaysia, which broke out immediately after their separation.[5]

By the end of 1967, 229 items were subject to tariffs, of which 118 were at specific rates and 80 at ad valorem rates; for the remaining 31 items, both specific and ad valorem rates were stated in the customs order, but at any one time the rate that yielded higher revenue would apply. Protection covered only part of the manufacturing sector and was at a low level. As will be seen, the majority of tariff rates, expressed in ad valorem equivalents, were below 25 percent.

Revenue from these protective tariffs remained low. In 1967 they generated only S$16.5 million (or 9 percent of the total duty revenue of S$183.5 million), compared with S$43.5 million from liquor (24 percent), S$47.1 million from tobacco (26 percent), and S$53.0 million from petroleum products (29 percent). On application from local manufacturers, duty exemptions were granted for imported inputs that had no close local substitutes. The total amount of these exemptions was estimated to be about S$10.2 million in 1967.

Quantitative restrictions were also used for nominal protection. Although quotas were being gradually abandoned as the means of protection, 72 products were still subject to quotas by the end of 1967. All quotas were stated as a percentage of the value of imports in a particular year between 1962 and 1966; they were reviewed quarterly by the Tariff Advisory Committee.

The protective tariffs and quotas were imposed according to a six-digit classification of commodities (and, in some instances, on even more closely specified items) as defined by the Singapore Trade Classification (STC). This classification scheme is much more detailed and disaggregated than the Singapore Industrial Classification (SIC) that was used by the Census of Industrial Production.[6] Sugar, for example, is divided into five items in the STC according to the degree of polarization, and manufactured tobacco is classified into nine items depending on the form (cigars, cigarettes, snuff, and so on), the type of container, and distribution (retail or wholesale).

The first step in the calculation of nominal protection was to match the STC with the SIC. Subsequently the items under tariffs and quotas were reclassified into 104 categories of commodities, of which 59 were subject to tariff protection but not to quotas, 20 were subject to quotas but not to tariffs, and the remaining 25 were subject to both tariffs and quotas.

Among the commodities under tariffs, 49 had tariff rates of 25 percent or lower, another 21 had rates ranging between 25 and 50 percent, and the remaining 24 had tariffs of 50 to 200 percent. Among the 25 commodities that were subject to both tariff and quota, 14 had tariff rates of 25 percent or less and 8 had tariff rates of between 25 and 50 percent. Higher tariffs were imposed on two types of refrigerators (150 percent) and caustic soda (76 percent). The highest tariff rates, those on cigarettes (200 percent) and on beer and stout (180 percent), were imposed not so much for the purpose of protection but to raise revenue. Except for these two commodities, tariffs ranged from 36 percent for caramel to 160 percent for matches.

The quotas were set at 1 to 120 percent of import value in a particular year between 1962 and 1966. In general, the quotas were restrictive; for 28 commodities, only 30 percent or less of earlier imports were allowed in. In no case, however, were imports completely banned. The quota system concentrated primarily on three commodity groups: bicycles and parts, tires and tubes, and miscellaneous chemical products. Only one local firm was producing the commodities in each of the first two groups. The combined output value (at world market prices) of these two firms was only S$26.5 million, or 0.4 percent of Singapore's manufacturing output in 1967.

The relative importance of the 104 commodities under tariff and quota protection, in terms of their shares in manufacturing output expressed in world market prices, is:

	Output value (thousands of S$)	*Percent*
Tariff only (59 commodities)	189,027	11.5
Quota only (20 commodities)	157,875	9.7
Quota and tariff (25 commodities)	7,231	0.4
Total	354,133	21.6

Despite the substantial increase in the number of commodities placed under tariff or quota protection, the share of protected commodities produced locally still did not reach one fourth of the output of the manufacturing sector. The largest industry, petroleum products, which accounted for 22.3 percent of the value of manufacturing output in world prices, was not protected.[7] In the second and third largest industries, food manufacturing (19 percent of the total output) and the manufacture of chemical

products (7 percent of the total output), only relatively few commodities were placed under tariffs or quotas.

Since quotas have the potential effect of raising nominal protection above legal tariff rates, these rates do not give an appropriate indication of nominal protection. For this reason and to determine whether tariffs were redundant in the sense that the domestic price was less than the sum of the c.i.f. import price plus the tariff rate, comparisons between domestic and import prices had to be made. For a commodity subject to a quota, the price differential shows the tariff equivalent of the quantitative restriction. In the case of tariff redundancy, the price differential indicates the extent of realized protection. In both instances, the price differential was taken to be the nominal rate of protection. Exceptions were made for all import-competing products, for which the nominal rate of protection was assumed to equal the tariff rate in cases where quantitative restrictions did not apply, and for export goods, for which nominal protection was taken to be zero.

Most of the data on prices were obtained from the Committee on Tariff Matters (CTM), under the Ministry of Finance. Such data are contained in background and position papers on commodities under quotas and tariffs, submitted to the committee by the Economic Development Board and the Trade Division. In some instances, data were obtained directly from the Economic Development Board and the Trade Division, which subsequently became the Department of Trade.

World market prices are stated on a c.i.f. basis. For most commodities the c.i.f. price of the major sources of imports was used. Domestic prices were expressed ex-factory (net of taxes, transport cost, and markup). Since the study focused on manufactured products, which are often differentiated, local manufacturers and traders were asked to judge the comparability of qualities. The price data thus obtained were used to calculate the percentage excess of domestic prices over world market prices. This percentage excess is referred to as the implicit tariff.

Table 9.1 classifies the 104 commodities for which price comparisons were made according to the relationship between the implicit tariff and the legal tariff and the presence or absence of quantitative restrictions. Two features stand out from the table. First, as expected, most commodities for which the implicit tariff exceeded the legal tariff were subject to quotas. In these cases, the implicit tariff was used to estimate nominal protection rates. The only two exceptions were soap flakes and powder, and nuts and bolts. For the former, the implicit tariff was also used because these commodities not only are exported but also compete with imports. For nuts and bolts, the legal rate was used to estimate the nominal protection rate since these items competed with imports.

Second, tariff redundancy was a widespread feature of the protective structure. Among the 95 commodities for which price data were available, 62 came under this category. Among them, 17 commodities had legal tariff rates exceeding the implicit tariff rate despite the imposition of quotas. In two cases—sweetened condensed milk and writing ink—the implicit tariff rates were negative; for these commodities, the nominal rate of protection was taken to be zero.

To determine the nominal rate of protection, the commodities under study should ideally also be classified under various trade categories according to certain criteria concerning export and import shares. Such a classification could not be done at the six-digit commodity level since data on retained imports, which are needed for calculating import shares, were available only at the more aggregative four-digit level. Import and export shares were therefore calculated at the SIC four-digit level. The first step was to define import and export shares in the context of Singapore's entrepot trade. Thus import shares have been calculated as the proportion of *retained imports* in apparent consumption, defined as the sum of the domestic consumption of domestic goods and retained imports. Export shares have been calculated as the proportion of export sales in the *total sales of domestically produced products* apart from reexports.

Data on domestic and export sales, retained imports, and domestic consumption were needed for the calculation. The data on sales were available from the *Census of Industrial Production, 1967*, and data on retained imports and apparent consumption were available from estimates of the Department of Statistics. Here also, it was necessary to match the STC with the four-digit SIC. There were some 110 four-digit SIC industries (or commodity groups) in manufacturing in the year 1967, but the Census presented data for only 70 industries, because some industries that had a small number of firms were treated together in order to keep their data confidential. The import and export shares, together with estimates of legal and implicit tariff rates for the 70 industries in 1967, are shown in Appendix Table 9.1. The industries were classified into four trade categories according to the following criteria:

	Imports as percentage of consumption	*Exports as percentage of production*
Export industries (10 industries)	Less than 10 percent	More than 10 percent
Export-and-import-competing industries (42 industries)	More than 10 percent	More than 10 percent
Import-competing industries (12 industries)	More than 10 percent	Less than 10 percent
Non-import-competing industries (6 industries)	Less than 10 percent	Less than 10 percent

Table 9.1. *Singapore: Relationship between Legal Tariff and Implicit Tariff for 104 Six-digit Commodities and 70 Four-digit Industries, 1967*

Relationship of Implicit to Legal Tariff	Number of Commodities	Number of Industries per Trade Category				
		IC	NIC	X	XIC	Total
Implicit Tariff More Than Legal Tariff	21	1	0	0	3	4
Quota	19	1	0	0	3	4
No Quota	2	0	0	0	0	0
Implicit Tariff Equal to Legal Tariff	12	4	5	7	18	34
Quota	6	0	0	1	1	2
No Quota	6	4	5	6	17	32
Implicit Tariff Less Than Legal Tariff	60	6	1	2	20	29
Quota	15	1	0	0	8	9
No Quota	45	5	1	2	12	20
Implicit Tariff Less Than Zero	2	0	0	0	0	0
Quota	2	0	0	0	0	0
No Quota	0	0	0	0	0	0
Subtotal	95	11	6	9	41	67
Price Data Not Available	9	1	0	1	1	3
Quota	3	0	0	0	0	0
No Quota	6	1	0	1	1	3
Total	104	12	6	10	42	70

Among the export-and-import-competing industries are three—shirts (2433), house furnishings (2441), and other made-up textiles (2499)—for which export shares were greater than 10 percent and import shares were assumed to be in excess of 10 percent, for lack of data.

The next step was to aggregate the legal and implicit tariff rates to the four-digit industry level. The values of sales for domestic use and exports, expressed in world market prices, were used as weights in the averaging. The legal and implicit tariff rates for the 39 industries that had at least one commodity subject to tariff or quota were obtained by calculating the weighted averages.[8]

For the remaining three- and four-digit categories, legal tariff rates were zero and the implicit tariff was also assumed to be nil.

To determine the nominal protection rates, the industries were first classified according to the four trade categories: (1) For export industries, the nominal rates of protection for domestic sales and for export were both assumed to be nil; (2) for export-and-import-competing industries, the nominal rate of protection was taken to equal the implicit tariff,[9] while it was assumed to be nil for export sales; (3) in the case of import-competing industries, the nominal rate of protection on domestic sales was equated with the legal tariff; and (4) in the case of the non-import-competing industries (NIC), the nominal rate of protection for domestic use was taken to equal the implicit tariff. In the case of import-competing goods, the presence of import restrictions was also taken into account because these may raise the nominal rate of protection above the tariff.

The 70 industries in Table 9.1 are classified according to trade categories, the presence or absence of import restrictions, and the relation between the implicit and legal tariff rates. Only four industries had an implicit tariff greater than the legal tariff, and in all of them quotas were imposed. Three industries—other rubber products (3099), incense medicaments (3195), and other chemicals (3199)—were classified as export-and-import-competing, and hence the nominal protection of domestic sales was taken to equal the implicit rate. In the fourth industry, other transport equipment (3899), the nominal protection rate was taken to equal the legal tariff, which was zero, because this is an import-competing industry and because the ten commodities subject to quotas (bicycles and parts) constituted only 5 percent of the output value of the industry.[10]

The cases where the implicit tariff was equal to the legal tariff were the most numerous: a total of 34 industries. Except for plywood and veneer (2512) and manufacture and assembly of motor vehicles (3831/32/33), none of these industries was subject to import restrictions. Moreover, apart from paints and enamels (3131), these were all nonprotected industries for which legal tariff rates were zero and the implicit tariff was assumed to be also nil.

The implicit tariff was less than the legal tariff in 29 industries, 9 of which were subject to quota and 20 of which had no import restriction. Among those subject to quota, industries classified as export-and-import-competing were taken to have a nominal protection rate equal to the implicit tariff. Milk products (2022) is an import-competing industry and its nominal protection rate was taken to equal the legal tariff. In the second group of 20 industries, where no quotas were imposed, the excess of the legal over the implicit tariff rate indicated tariff redundancy. The nominal protection rate was selected according to the trade category. It was set equal to the legal rate for the five import-competing industries, and equal to the implicit tariff for the one non-import-competing industry (3340, cement and cement additives) and the twelve export-and-importing-competing industries. Finally, nominal protection rates were taken to be zero on all export sales as well as on the total sales of the two export industries in this group (2613, metal furniture; and 3994, neon signs and advertisements).

The nominal protection rates thus obtained for the 70 four-digit industries are shown in Appendix Table 9.1. The table shows that the nominal protection rate on domestic sales was zero for 36 industries, and ranged from 1 to 30 percent for the remaining 34 industries. The highest rate (30 percent) applied to the manufacture of biscuits (2061). The nominal protection rates on total sales were obtained by averaging nominal protection on domestic sales and the zero nominal protection on exports, with output value in world market prices used as weights. They ranged from 1 percent for alcoholic beverages (2110/30) to 29 percent for biscuits (2061). Altogether, nominal protection rates were less than 10 percent on the domestic sales of 50 industries and on the total sales of 55 industries, including 36 cases of no protection; they were between 10 and 20 percent for 12 and 9 industries, and between 20 and 30 percent for 8 and 6 industries, respectively. In no industry did nominal protection rates exceed 30 percent (Table 9.2).

The four-digit nominal protection rates were further aggregated to the two-digit industry-group level, with output value in world market prices used as weights. The estimates of these rates for a total of 22 two-digit industry groups for the year 1967 are shown in Table 9.3. This breakdown is identical to that of the industrial sectors (3–24) in the Singapore input-output table, which is used for the estimates of effective protection.

At this aggregate level, four industry groups had zero nominal protection rates: wood and wood products (25), furniture and fixtures (26), printing and publishing (28), and petroleum products (32). The positive nominal protection rates on domestic and on total sales ranged from 1 percent for transport equipment (38) to 28 percent for tobacco (22). Overall the level of nominal protection was low. Nominal protection rates were lower than 5 percent on domestic sales in five industry groups (including the four with zero rates); and on total sales in fifteen industry groups. The average nominal protection rate for the manufacturing sector as a whole was only 5 percent for domestic sales and 3 percent for total sales.

Next, we analyze the structure of nominal protection among industry groups that incorporate both the stage of processing and market destination (whether export or

Table 9.2. *Singapore: Frequency Distribution of Nominal and Effective Protection Rates, 1967*

Value		Legal Rate		Nominal Protection		Effective Protection		
						Balassa		Corden
From	To	Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Average
-100.0	-50.1	0	0	0	0	1	0	0
- 50.0	-40.1	0	0	0	0	1	0	0
- 40.0	-30.1	0	0	0	0	1	0	0
- 30.0	-20.1	0	0	0	0	0	2	1
- 20.0	-10.1	0	0	0	0	4	3	4
- 10.0	- 0.1	0	0	0	0	32	34	34
0		32	32	36	36	2	2	2
0.1	10.0	8	13	4	9	8	10	10
10.1	20.0	10	12	12	9	2	7	7
20.1	30.0	16	12	8	6	4	1	3
30.1	40.0	2	0	0	0	5	2	2
40.1	50.0	0	0	0	0	3	2	2
50.1	100.0	1	0	0	0	3	3	1
100.1	200.0	1	1	0	0	2	2	3
200.1 & above		0	0	0	0	2	2	1

domestic sales), and among the trade categories defined above. Since the two-digit estimates are too aggregative for this purpose, the four-digit estimates have been used in making calculations. The results are presented in Tables 9.4 and 9.5.

The 70 four-digit industries in Table 9.4 are classified into 9 industrial categories. The largest category is intermediate products I (VIA), which accounts for one fourth of value added in manufacturing expressed in world market prices. This category includes sawmilling, petroleum refineries, basic metals, glass, plastic materials, leather, and yarn. Along with transport equipment, the nominal protection rate for this category was the lowest among the 9 categories, at 1 percent on both domestic and total sales. At the other extreme, the highest rate of nominal protection was given to beverages and tobacco (III): 17 percent on domestic sales and 14 percent on total sales. High nominal rates of protection to beverages and tobacco are common in developing countries.

Table 9.3. *Singapore: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Two-digit Industry Group, 1967*
(percent)

SIC Code		Export Share	Import Share	Nominal Protection			Effective Protection				Effective Subsidy				Nominal Input Protection
							Balassa			Corden	Balassa			Corden	
				Export Sales	Domestic Sales	Average	Export Sales	Domestic Sales	Average	Average	Export Sales	Domestic Sales	Average	Average	
20	Food Manufacture	36.5	26.1	0	5	3	0	7	5	5	0	7	5	5	11.3
21	Beverages	24.8	24.7	0	1	1	0	0	0	0	-5	-5	-5	5	0.9
22	Tobacco Manufacture	10.1	20.9	0	28	25	0	98	86	84	-22	76	63	62	2.0
23	Manufacture of Textiles	39.4	48.7	0	17	10	0	30	17	16	12	42	29	27	2.1
24	Manufacture of Footwear & Apparel	61.2	78.8	0	4	2	0	0	0	0	-2	-2	-2	-2	4.1
25	Manufacture of Wood & Cork	38.3	10.0	0	0	0	0	-1	-1	-1	0	-1	-1	-1	0.4
26	Manufacture of Furniture & Fixtures	15.4	14.1	0	0	0	0	-2	-2	-2	-1	-3	-3	3	1.8
27	Manufacture of Paper & Paper Products	22.4	47.9	0	4	3	0	7	5	5	-2	-5	3	3	2.2
28	Printing, Publishing, & Allied Industries	11.7	29.1	0	0	0	0	-2	-2	-2	-6	-8	-8	-8	2.6
29	Manufacture of Leather & Leather Products	58.8	48.2	0	14	5	0	12	4	4	-8	4	-4	-4	11.1
30	Manufacture of Rubber Products	25.4	20.0	0	21	15	0	53	38	38	5	58	43	43	3.5
31	Manufacture of Chemicals & Chemical Products	36.0	50.1	0	8	5	0	21	14	13	1	22	15	15	2.3
32	Manufacture of Petroleum Products	27.9	0	0	0	0	0	0	0	0	14	14	14	14	0
33	Manufacture of Nonmetal Products	24.6	16.1	0	5	4	0	8	6	6	-3	5	2	2	2.9
34	Basic Metal Industries	39.2	41.6	0	7	4	0	12	7	7	2	14	9	9	2.2
35	Manufacture of Metal Products	31.3	31.3	0	4	3	0	4	3	3	-2	2	1	1	2.1
36	Manufacture of Non-electrical Machinery	15.1	11.0	0	6	5	0	11	9	9	0	10	9	9	0.7
37	Manufacture of Electrical Machinery, Apparatus, & Appliances	60.6	56.9	0	16	8	0	21	10	10	0	21	10	10	2.2
38	Manufacture of Transport Equipment	34.4	56.9	0	2	1	0	-2	-1	-1	-2	-4	-3	-3	3.2
39	Miscellaneous Manufacturing Industries	6.0	30.0	0	2	2	0	-1	-1	-1	-5	-6	-6	-6	2.1
Total Manufacturing Sector		30.5	34.4	0	5	3	0	9	6	6	1	8	6	6	2.9

Note: Nominal and effective rates of protection on exports are nil.

Table 9.4. *Singapore: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1967*
(percent)

	Legal Tariff		Nominal Protection		Effective Protection			Effective Subsidy			
					Balassa		Corden	Balassa			Corden
	Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Average	Export Sales	Domestic Sales	Average	Average
Processed Foods (II)	6	3	4	3	5	3	3	0	5	3	3
Beverages & Tobacco (III)	125	85	17	14	38	29	28	-8	26	18	18
Construction Materials (V)	22	20	6	6	17	16	11	-3	12	13	9
Intermediate Products I (VIA)	2	1	1	1	1	1	1	7	11	9	9
Intermediate Products II (VIB)	7	5	8	5	15	10	9	0	15	10	9
Nondurable Consumer Goods (VII)	5	3	2	2	1	0	0	-3	-4	-4	-4
Consumer Durables (VIII)	15	11	11	7	16	10	10	0	16	10	-9
Machinery (IX)	13	6	9	5	10	6	6	0	10	6	6
Transport Equipment (X)	2	1	2	1	-2	-1	-1	-2	-4	-3	-3
Total Manufacturing Sector (II, III, V-X)	17	10	5	3	9	6	6	1	8	6	6

Note: Nominal and effective rates of protection on exports are nil.

Table 9.5. *Singapore: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1967*
(percent)

	Legal Tariff		Nominal Protection		Effective Protection			Effective Subsidy			
					Balassa		Corden	Balassa			Corden
	Domestic	Average	Domestic	Average	Domestic	Average	Average	Export	Domestic	Average	Average
Export Industries	1	0	0	0	0	0	0	6	8	7	7
Export-and-Import-Competing Industries	33	18	8	5	12	8	7	-2	9	5	5
Import-Competing Industries	7	7	7	7	19	18	16	-3	15	15	13
Non-Import-Competing Industries	7	7	1	1	-3	-3	-2	-3	-6	-6	-5
All Manufacturing Sector Industries	17	10	5	3	9	6	6	1	8	6	6

Nominal protection rates rose from intermediate products I to intermediate products II (VIB)—plywood, leather products, coated and pressed metals, and fabricated metal products—for which nominal rates averaged 8 percent on domestic sales and 5 percent on total sales. Escalation did not extend to nondurable consumer goods, such as shirts, soap, cosmetics, or plastic household goods, which received average nominal protection of 2 percent on both domestic and total sales. However, consumer durables such as television sets, air conditioners, refrigerators, and furniture had a higher level of protection (11 percent on domestic sales and 7 percent on total sales). For processed food, the level of nominal protection was approximately the same as that for the manufacturing sector as a whole, which averaged 5 percent on domestic sales and 3 percent on total sales.

The export-and-import-competing industries, the most important trade category in Singapore, accounted for three fifths of value added in the manufacturing sector. Of a total of 70 industries, 39 had export *and* import shares exceeding 10 percent. For export-and-import-competing industries the average nominal protection rate on domestic sales was 8 percent, the highest among the four trade categories (Table 9.5), but on total sales of these industries it fell below those of import-competing industries (5 percent and 7 percent, respectively).

Export industries provided one fourth of value added in the manufacturing sector, and petroleum products accounted for about three fifths of this amount. They had a zero rate of nominal protection, while nominal protection rates averaged 1 percent for non-import-competing industries.

Estimates of Effective Protection

Estimates of effective protection (the percentage excess of domestic over world market value added) were based on data from the *Census of Industrial Production, 1967* at the four-digit and two-digit industry-group levels. The data had to be adjusted, however, because the concept of value added adopted by the census differed slightly from the concept of domestic value added used in this investigation. The census defined value added as "the value of output (valued at ex-factory prices) less that of total inputs and work given out." Total inputs included the cost of materials (raw materials, chemicals, and packaging materials used), fuel and utilities, and internal transport, whereas "work given out" referred to payments to other firms or persons for work performed on basic or raw materials supplied by the firm concerned.[11] As such, the value added in the census included rent (or annual value added in the case of owner-occupied premises), depreciation, repairs and maintenance of plant and machinery, interest on working capital, and some administrative costs. While rent and interest are truly value added items since they represent payments to factors of production, expenses such as depreciation and contracted repair and maintenance services should be deducted from the census value added in order to arrive at domestic value added. A few minor items that are not part of value added (for example, office stationery and insurance premiums) have not been deducted, because detailed data on these items were not available.

The next step was to identify traded and nontraded inputs so that the Balassa and Corden methods could be used to measure effective protection and subsidy rates. The Balassa method excludes value added in the production of nontraded goods from the value added in processing, whereas the Corden method considers them together. On the basis of census data, traded inputs were taken to include industrial materials, chemicals, and packing materials, whereas nontraded inputs include power, lighting, water, fuels, and internal transport. Data on traded and nontraded inputs were available at the four-digit and two-digit levels. The input values of individual items of industrial materials subject to tariffs or quotas that were used in the production of selected commodities (six-digit) were also made available by the Department of Statistics from the primary returns of the census.

To obtain world market value added, domestic values of output, inputs, and depreciation had to be "deflated" by the relevant nominal rates of protection. Data on output valued in world market prices at the six-digit commodity and four-digit industry levels were already available from calculations of nominal rates of protection. In the case of tradeable inputs, the relevant nominal protection rates of the individual commodities subject to tariffs and quotas were used to deflate input values. For particular commodities that were exempted from tariffs when they were used as inputs (for example, sugar, cement, and inputs used by export industries), the nominal rate of protection was taken to be zero. Depreciation expenses were deflated by the nominal protection rate for capital goods industries.

Effective protection rates at the four-digit industry level are shown in Appendix Table 9.1. These estimates are based on the Balassa and Corden methods. Average protection rates on total sales based on the Balassa method ranged from −23 percent for animal feed (2097) to 708 percent for milk products (2022). On domestic sales, they ranged from −38 percent to 747 percent for the same industries. Effective rates exceeded 200 percent in one other industry, biscuits (2061).

The frequency distribution in Table 9.2 shows that

the effective protection rates of four-digit industries were highly concentrated within a small range of values. On domestic sales, 32 industries had average effective rates between zero and −10 percent and another 10 had average effective protection rates from zero to 10 percent if the Balassa measure is used. At the same time, only 4 industries had average effective protection rates in excess of 100 percent and 7 industries had effective protection rates less than −20 percent. The results are similar if we consider effective rates for total sales and the estimates based on the Corden method.

Next, we examined the relationship between nominal and effective protection rates in the 70-industry breakdown. The Spearman rank correlation coefficients were 0.73 in correlating estimates for domestic sales and 0.76 in correlating estimates for total sales, according to the Balassa method of estimating effective rates. The rank correlation coefficient between the Balassa and the Corden rates was 0.98.

The four-digit effective protection rates were aggregated to the two-digit industry-group level, the weights being world market value added. The two-digit estimates are shown in Table 9.3. For domestic sales, average effective protection rates ranged between −2 percent for printing and publishing to 98 percent for tobacco manufactures when the Balassa method was used. Average effective protection rates for the manufacturing sector were rather low: 9 percent for output sold in the domestic market, and 6 percent for total output. In turn, effective protection rates were nil for exports that could obtain all their inputs duty free.

Tables 9.4 and 9.5 show average effective protection rates according to industry categories and trade categories, respectively. Effective protection rates were the highest for beverages and tobacco (38 percent on domestic sales and 29 percent on total sales), followed by construction materials (17 percent on domestic sales and 16 percent on total sales). Effective protection rates were higher than the manufacturing average also in the case of intermediate products II (VIB) and consumer durables (VIII).

At the other extreme, rates of effective protection were lowest on transport equipment (−2 percent on domestic sales and −1 percent on total sales), and nondurable consumer goods (1 percent on domestic sales and zero on total sales). Effective protection rates on the other two industry categories, intermediate products I (VIA) and processed foods (II) were also below the manufacturing average, while those on machinery equaled the average.

It appears, then, that in Singapore, the effective protection rates did not follow the pattern of escalation common in other countries. Although the intermediate products II had higher protection than intermediate products I, escalation did not extend to consumer goods. While consumer durables were given higher effective protection, nondurable consumer goods had a much lower level of protection.

Among trade categories, import-competing industries had average effective rates of protection of 19 percent on domestic sales and 18 percent on total sales (Table 9.5). This category was followed by export-and-import-competing industries, which had protection of 12 and 8 percent on domestic and total sales, respectively. In turn, effective rates averaged zero for export industries and −3 percent for non-import-competing industries in regard to domestic and total sales.

Estimates of Effective Subsidies

Apart from tariffs and quotas—which raise or lower value added relative to that under a free-trade policy regime by changing the prices of final products and their intermediate inputs—policy instruments such as differential corporate tax rates and preferential loans also provide incentives, or disincentives, to domestic industry. Effective subsidy rates are designed to quantify the additional incentives provided by the profit tax differentials and preferential loans.

The impact of differential tax rates on profits in a particular industry is measured by the difference between the actual tax liability of the industry and the hypothetical liability calculated on the assumption that the industry paid the average tax rate on its entire profits. The difference measures the negative or positive tax subsidy that the industry receives. Similarly, the difference between the industry's actual interest payments and the estimated interest payments that would have been paid at the average interest rate measures the (negative or positive) interest subsidy to the industry. The percentage difference between the domestic value added adjusted for deviations from average tax and interest payments and world market value added is the estimate of the effective rate of subsidy. Thus, industries that receive tax and interest subsidies will have higher rates of effective subsidy than of effective protection, and the reverse is true for industries that pay above average profit taxes and interest rates. Since the algebraic sum of all subsidies over all component industries must be zero, however, the effective rate of subsidy for the manufacturing sector as a whole must be equal to the average effective protection rate.

Method of Calculation

Effective subsidy rates were calculated from data on the amount of pretax profits in each industry, the profits

of the pioneer firms that were exempted from profits tax, the amounts of preferential loans and of total loans, and interest rate payments. These data were provided by the Economic Development Board and the Registry of Companies. Since data on interest payments were available only for two-digit industry groups, effective rates of subsidy could be estimated only for these groups. The estimates are shown in Table 9.3.

There is a high degree of correlation between effective protection and effective subsidy rates. The Spearman rank correlation coefficients are 0.71 for domestic sales and 0.72 for total sales. It thus appears that, in Singapore, tax exemptions and concessional loans did not appreciably modify the pattern of effective protection. Effective subsidy rates on export sales were not zero, however, since export industries generally received subsidies in the form of tax and credit preferences.

A comparison of effective subsidy and effective protection rates on total sales shows that the former exceeded the latter in five industry groups; the opposite conclusion applied to ten industry groups, and the rates were equal in five industry groups. Effective subsidy rates were higher than effective protection rates for textiles (23), rubber products (30), chemicals and chemical products (31), petroleum refineries and petroleum products (32), and basic metals (34). These groups received subsidies from the government in the form of profit tax exemption, loans at concessionary rates, or both. The difference was especially large for the petroleum industry (32), which received substantial tax advantages.

To estimate effective subsidy rates for industry groups and trade categories, it was assumed that the absolute difference between effective rates of protection and of subsidy calculated at the two-digit level also applied to all four-digit commodities within a two-digit industry group. Because of the importance of petroleum to intermediate products I, average effective subsidy rates in this category (9 percent) were substantially higher than effective protection rates (1 percent). The opposite conclusion applied to construction materials, nondurable consumer goods, transport equipment, and, in particular, beverages and tobacco. In the latter case, effective subsidy rates averaged 18 percent, compared with effective protection rates of 29 percent (Table 9.4).

Subsidies provided to export industries in the form of preferential tax and credit treatment have given rise to differences between effective protection and effective subsidy rates for the four trade categories. These subsidies accounted for 7 percent of value added in world market prices in the export industry category, while compensating excess taxes and interest payments averaged 3 percent in the other three categories.

As Table 9.5 shows, the average effective subsidy rate on the export category was above that for the export-and-import-competing category (7 as against 5 percent) while the opposite was the case for effective protection rates (0 as against 8 percent). Effective subsidy rates were the lowest for the non-import-competing category (−6 percent) and the highest for the import-competing category (15 percent). These results relate to total sales. For the manufacturing sector as a whole, average rates of effective subsidy were 1 percent for exports, 8 percent for domestic sales, and 6 percent for total sales.

Adjustment for overvaluation compared with the free-trade situation modifies the estimated incentive rates. Thus, net effective protection is estimated at −5 percent for exports and 2 percent for production for domestic markets, while the corresponding figures for effective subsidies are −5 percent and 2 percent. Net protection figures for other commodity categories can be easily derived; to save space, they are not shown in the tables.

Estimates for Two-digit Industry Groups

The incentive structure within two-digit industry groups is examined by using effective protection and subsidy rates derived by the Balassa method. Unless otherwise noted, the rates refer to total sales.

PETROLEUM. Oil refineries and petroleum products (32) make up the most important industry group in terms of contribution to total manufacturing value added (15 percent), in domestic prices. Nominal protection and effective protection rates on petroleum products were nil. This industry group consisted of eight firms, all of which were given pioneer status.

This industry group is highly capital intensive; it had a capital-labor ratio of S$53.6 thousand per worker in 1967, and its contribution to employment was the smallest among all industry groups (1 percent of total manufacturing employment). The value added content of its output was about 20 percent, which was lower than for any other group. It received the highest subsidies (14 percent relative to its world market value added), however, because of its supposed spread effects to ship repairing (of tankers), its supply of by-products to the chemical industry, and its demand for domestically produced machinery and metal products.

PROCESSED FOODS. The category processed foods (20) ranked second in terms of its share of total manufacturing value added (10 percent) and first in terms of its contribution to employment in the manufacturing sector (11 percent). This industry group had the largest number of firms and produced a wide variety of products ranging from canned food, baked goods, and confectionery to ice and animal feed. The average effective protec-

tion accorded to the group was 5 percent, which is slightly lower than the average for the manufacturing sector as a whole. But this average hides a wide variation in effective protection rates among component industries, from −23 percent for animal feed (2097) to 708 percent for milk products (2022).

The variations in effective protection rates among sugar-using food products, such as sweetened condensed milk (part of 2022), biscuits (2061), and confectionery (2080), partly depended on whether sugar duties were payable. The legal duty on imported refined sugar was 81 percent. In 1967 seventy-four factories (including those in the beverage industry) were exempted from this duty. In turn, all coffee powder (2096) was exported, and both the product and its inputs were duty free. Animal feed (2097) was also admitted duty free, but tariffs on its inputs resulted in an average effective protection of −23 percent.

Within the other processed food category (2099), canned food and monosodium glutamate were the most important. The former is a long-established industry in Singapore that became a successful export industry after 1967. The manufacture of monosodium glutamate in Singapore is a recent phenomenon; the investment came mainly from Taiwan and Hong Kong. There was a relatively large domestic market as the product is an essential ingredient in Chinese cooking. A high tariff wall (90 percent) was erected to protect the local manufacturers from imports of well-established brands from Hong Kong, Japan, and Taiwan.

On the whole, processed food industries did not receive tax and credit preferences. Correspondingly, their average effective rate of subsidy was the same as their effective rate of protection (5 percent). The two next largest industry groups, transport equipment (38) and printing and publishing (28), received negative subsidies. They had effective protection rates of −1 and −2 percent, respectively, and their effective subsidy rates averaged −3 and −8 percent.

TRANSPORT EQUIPMENT. Within transport equipment, which contributed 8.4 percent of manufacturing value added, shipbuilding and repairing (3813) and motor vehicle assembly (3831/33) were the most important activities. The former consisted of twenty-four firms, of which twenty were small local enterprises engaged in repairing barges and speedboats and building wooden boats. Only four firms had modern facilities, of which Jurong Shipyard, a joint venture between EDB and Japanese Ishikawajima-Harima Heavy Industries, is the best known. The Jurong Shipyard and two larger yards accounted for 52 percent of value added, 53 percent of employment, and 81 percent of fixed capital assets in the shipbuilding and repairing industry. In 1967 the output of these firms was still largely derived from repairing tankers and oceangoing vessels; shipbuilding activity was limited to small vessels. The rapid expansion of shipbuilding came only in the late 1960s when oil exploration activities began in Southeast Asia and when the large modern British naval base facilities were handed over to Singapore and converted into a commercial shipyard.

The motor vehicle industry, which engaged in the assembly of passenger cars, buses, trucks, and motorcycles, and the manufacture of their parts and accessories, consisted of one long-established foreign firm, Ford Motor, two medium-size and eight small local firms. Ford Motor and the two larger local firms dominated the industry with 87 percent of the value added, 80 percent of employment, and 92 percent of fixed capital assets. To encourage the local assembly of vehicles, a 10 percent tariff and a quota were imposed on passenger cars, buses, and trucks. The quota was relatively liberal, however, and the growth of retained imports did not decline.

PRINTING AND PUBLISHING. With a contribution of 8 percent of manufacturing value added, printing and publishing had the highest value added content per unit of output (57 percent) among all the industry groups, largely because its activities have a large element of services. Apart from numerous small establishments engaged in job printing and binding, a few large firms in this industry undertook printing and binding jobs from abroad, with an export share of 12 percent.

The above four industry groups have high value added but low effective protection and subsidy rates. By contrast, industry groups with high effective rates—for example, tobacco manufacturing (22), textiles (23), and rubber products (30)—had relatively low value added. These will be discussed next together with the footwear and wearing apparel category (24).

TOBACCO MANUFACTURING. With 6.5 percent of value added in the manufacturing sector, tobacco manufacturing had an effective protection rate of 86 percent, the highest among all industry groups. Although it also had the highest negative subsidies (−21 percent), its average effective subsidy rate was still 63 percent. Tobacco manufacturing grew rapidly in the early 1960s, largely because high import duties were imposed on cigarettes (200 percent) and cigars (80 percent), whereas the duty on imported raw tobacco was low. The industry was dominated by two large modern firms—Rothmans and Singapore Tobacco—and the rest were small local enterprises.

TEXTILES. Textiles formed a small industry, with a value added share of less than 1 percent in 1967.

Although textiles had traditionally been the third most important commodity group in the Singapore entrepot trade (after rubber and petroleum products in terms of value), modern textile mills were not established until after 1963, when capital from Hong Kong sought to avoid the restrictions imposed by the British government on the export of textiles from Hong Kong.[12] The government granted the industry concessional loans and taxes amounting to 12 percent of value added, which raised effective subsidy rates to 29 percent compared with an effective protection rate of 17 percent. In return, the firms were required to intensify their export drive. In fact, exports approached two fifths of domestic output in 1967 and two thirds in 1973. In view of the imposition of import quotas by the United Kingdom, United States, and Canada,[13] firms that expanded their exports to new markets such as the Eastern European countries and that diversified their production into new mixed synthetic-cotton textiles and downstream products were particularly successful.

FOOTWEAR AND WEARING APPAREL. Similarly, footwear and wearing apparel (24) benefited from the influx of Hong Kong investment. In 1959 there were only two firms producing rubber footwear and one producing leather footwear (the well-known Bata Shoe Company). By the end of 1967 the industry had grown to thirty-four firms, but only six of them were large firms with more than fifty workers. To protect the industry after independence, a 40 percent duty was imposed.[14] Only undergarments (2434) were protected by tariff, and, with inputs subject to tariffs, other forms of wearing apparel had negative effective protection and subsidies. As a result, the entire footwear and wearing apparel industry group, except for rubber footwear, received zero average effective protection and −2.4 percent average subsidies. Its share in value added in the manufacturing sector was 3 percent.

RUBBER PRODUCTS. Except for rubber footwear, the most important industry within the rubber products group (2.2 percent of manufacturing value added) was the manufacture of tires and tubes. There were only a few small local establishments in the industry before 1965, the year that Bridgestone (Malaysia) Ltd. started operation. By 1968 this firm not only had secured the domestic market but, through its aggressive export promotion, was able to export 65 percent of its products to thirty-four countries. This was achieved without protection, although average protection rates for the industry were raised by the high tariff on rubber footwear.

BEVERAGES. Among the remaining industry groups, beverages (21) had practically no protection. The industry accounted for 63 percent of manufacturing value added and was dominated by Frazer and Neave, the oldest manufacturing firm in Singapore (established in 1889). This firm produces a variety of soft drinks as well as beer.

CHEMICALS. Chemical products (31) contributed 59 percent of manufacturing value added in 1967. Products of the sixty-nine firms in this group ranged from various industrial chemicals to paints, detergents, soaps, and toilet preparations. Levels of effective protection also varied to a considerable extent, from 12 percent for soaps and detergents (3191) to 112 percent for paints and enamels (3131). For the whole industry, the average effective protection was 14 percent and the effective subsidy 15 percent. The tariff on detergents was aimed at reducing imports from Malaysia, particularly those under the brand names of "Fab" and "Breeze," which were well established in local markets because of effective advertising and sales promotion. After the tariff was imposed, the producers of one of the two brands set up a plant in Singapore.[15]

In the case of paint and enamels, the high level of protection was regarded as an antidumping measure. A 20 percent import duty was imposed in 1962 and was subsequently increased to 25 percent. At the same time, inputs such as solvents, resins, and dioxides were imported duty free. This protection, together with the increased demand from shipbuilding and repairing activities and the construction sector, helped the paint and enamels industry to expand rapidly, from two firms in 1959 to twelve firms with an output of S$7.3 million in 1967. Since almost all raw materials were imported, however, the value added content of its output was low. Also, there was evidence that local firms would suffer a serious setback if duty exemptions were lifted.[16]

In the early 1960s the implementation of the first five-year building program by the Housing and Development Board and the increased momentum of the construction of factory buildings by private investors and the EDB had generated a very large demand for construction materials, basic metals, and metal products. To stimulate the local production of these products, varying degrees of tariff protection were provided.

NONMETALLIC MINERALS. Among nonmetallic mineral products (33), cement is an interesting case. The cement industry started in 1962 with the establishment of a joint venture between two Japanese firms and a local one. By 1967 the industry had expanded to include three clinker-grinding mills. To protect this new industry from the price competition that resulted from excess production and price-cutting by West Malaysian cement manufacturers, a tariff of S$12 a ton was imposed in 1966. The

imposition of the tariff, however, was conditional upon the acceptance of a government-fixed ceiling price of S$53 a ton.[17]

The expansion of the cement industry was hampered by the price ceiling, which made it difficult for local producers to compete for supplies of clinker with Malaysian cement manufacturers who could offer higher prices.[18] Subsequently, capacity was expanded as price ceilings were adjusted. Nonmetallic mineral products (33) contributed 5.5 percent of manufacturing value added; they had average effective protection of 6 percent and an effective subsidy rate of 2 percent.

BASIC METALS. The basic metals industry (34) had an average effective protection rate of 7 percent and an effective subsidy rate of 9 percent; it accounted for 3.4 percent of manufacturing value added. The industry was dominated by a single large joint venture—National Iron and Steel Mills—which started operation in 1962. With the establishment of this firm, an 18 percent tariff was imposed on all types of steel bars. In 1966 quotas were also imposed. (The quota was 100 percent of 1965 imports for mild steel flat bars, but for mild steel round bars it was very restrictive—equivalent to only 1 percent of 1964 imports.) Because of protection and a rapidly growing demand from construction and shipbuilding and repairing activities, the output of National Iron and Steel Mills increased from 48.2 thousand tons in 1962 to 104.8 thousand tons in 1967. About 70 percent of the raw material (scrap iron) came from shipbreaking and other local sources. In fact, the mills had established a subsidiary, National Shipbreakers, to ensure a regular supply of raw materials.[19]

Protection was also accorded to two new firms producing steel pipes and tubes. In the case of black and galvanized steel pipes, a very restrictive quota (1 percent of 1964 imports) was imposed in addition to a 20 percent tariff. In contrast, conduit pipes were protected only by a quota equal to half of the 1964 imports. Although they were new, these firms not only successfully secured the domestic market but also exported 30 to 40 percent of their output to neighboring countries.

We have examined the structure of production and incentives for only twelve of twenty industry groups because detailed information was not available for the remaining eight groups. The discussion therefore proceeds in general terms.

Wood and wood products (25) and furniture and fixtures (26) had low negative effective protection and subsidy rates in 1967; leather and leather products had low positive effective protection and low negative effective subsidy rates; and paper and paper products (27) received lower than average incentives. Among these industry groups, wood and wood products were the most important in Singapore manufacturing, having a value added share of 6 percent. The value added share for both furniture and fixtures, and paper and paper products was 1 percent, and the share of leather products was 0.7 percent.

The manufacture of metal products (35), too, had lower than average rates of effective protection and subsidies. It accounted for 7 percent of value added in manufacturing, having grown into a diversified industry that exported almost one third of its output.

Nonelectrical machinery (36) and electrical machinery and appliances (37) received above average incentives, their effective protection and subsidy rates averaging 9 and 10 percent, respectively. While nonelectrical machinery was produced largely for domestic markets, a large proportion of electrical machinery was exported, its export share reaching 90 percent in 1973. Both industries accounted for about 3 percent of value added in the manufacturing sector, as did the miscellaneous manufactures group (39), which received effective protection of −1 percent and effective subsidies of −6 percent. Within the latter category, jewelry (3940) received high negative effective protection, at −9 percent, and the smaller plastic products category (3995) high positive effective protection, at 28 percent.

Structural Change in Singapore, 1960–73

As noted earlier, the drive to industrialize was motivated by severe unemployment and by the belief that the growth of entrepot trade would not provide sufficient employment and income growth. Unemployment was expected to become more serious because of the very high growth rate of population in the late 1950s.

Table 9.6 shows that the rate of unemployment declined from 13.5 percent in 1960 to 4.5 percent in 1973. But these figures do not reveal the progress made in creating new jobs. That 65,800 migrant workers—most of them from West Malaysia—constituted 9.1 percent of the labor force in 1971 indicates the full extent of employment creation.

The achievement in creating new jobs was mirrored in the performance of gross domestic product, which, in 1968 prices, grew from S$2,122 million in 1960 to S$7,239 million in 1973, at an annual average rate of 9.9 percent. Real per capita GDP in 1973, at more than US$1,500, was more than two and a half times that in 1960.

The reduction in the population growth rate from 3.2 percent in 1960 to only 1.7 percent in 1973 contributed to the rise of the employment rate and per capita income and reduced the dependency ratios. Population growth was brought under control by an effective family plan-

Table 9.6. *Singapore: Major Economic Indicators, 1960–73*

		1960	1967	1970	1973
	Computation of per Capita Income				
1.	GDP (S$ million at 1968 prices)	2,122	3,475	5,107	7,239
2.	Population (thousands)	1,634	1,978	2,075	2,185
3.	GDP per capita (S$ at 1968 prices)	1,400	1,916	2,690	3,630
4.	Gross National Saving as Percentage of GNP	7.9	17.5	19.3	24.9
	Percentage Shares of GDP				
5.	Gross Domestic Capital Formation	9.5	19.8	30.7	33.0
6.	Retained Imports	57.1 a/	62.2	n.a.	92.7
7.	Domestic Exports	10.1	28.5	30.5	49.7
8.	Domestic Exports as Percentage of Total Exports	6.2	31.8	38.5	49.5
9.	Official Reserves (S$ million)	336 b/	1,517	3,098	5,800
10.	Population Growth Rate (percent)	3.2	2.0	1.7	1.7
11.	Rate of Unemployment (percent)	13.5	8.1	6.0	4.5
12.	Manufacturing Sector Employment as Percentage of Total	7.5	11.4	19.4	26.0

a/ 1962.
b/ 1959.

Sources: Items 1, 3, and 5: Department of Statistics, Singapore National Accounts, 1960-73 (Singapore, 1975).

Items 2, 9, and 10: Department of Statistics, Yearbook of Statistics, various issues.

Item 4: Economic Survey of Singapore, 1974 (Singapore, 1975); and Yearbook of Statistics.

Item 6: S. Johari, "Changing Structure of Singapore's Retained Imports, 1962-68," Department of Economics, University of Singapore (Singapore, 1974); Singapore Balance of Payments, 1972-74 (Singapore, 1975).

Item 7: Budget Statement, 1974.

Item 9: Economic Survey of Singapore, 1974; and Budget Statement, 1974.

Item 11: Economic Survey of Singapore, 1974; and W. E. Chalmers, Critical Issues in Industrial Relations in Singapore (Singapore: Donald Moore Press, 1975).

Item 12: Yearbook of Statistics; Chalmers, Critical Issues in Industrial Relations in Singapore; and Budget Statement, 1974.

ning program coupled with the effects of higher standards of living and improvements in education.

The structural transformation of the economy is further seen in Table 9.7, which shows the composition of GDP in real terms. As expected, entrepot trade declined greatly in importance, from 18 percent of GDP in 1960 to less than 10 percent in 1973. Manufacturing increased its share of GDP substantially, from 13 percent in 1960 to almost 22 percent in 1973. The urban character of the economy can be seen from the preponderance of services and the small size of the agricultural sector, whose share in GDP declined from 4 percent in 1960 to less than 2 percent in 1973.

The increased sophistication of the economy is reflected in the increased contribution of the financial sectors to GDP, from 7.4 percent in 1960 to 10.5 percent in 1973. The growth of Singapore as a financial center is the result of deliberate policy. In 1968 offshore banking was permitted in Singapore to deal with Asian dollars, the cousins of the Eurodollar. By 1973 there were forty-five banks in Singapore with gross Asian dollar liabilities of more than US$6.3 billion.

Data on savings and investments confirm the dramatic transformation of the economy. Gross national savings rose from 8 percent of GDP in 1960 to 25 percent of GDP in 1973. Gross domestic capital formation increased from less than 10 percent in 1960 to 33 percent in 1973, a rate comparable to that in Japan. At the same time, net borrowing from abroad rose from 2 percent of GDP in 1969 to 8 percent in 1973.

Foreign investment was particularly important in manufacturing. Of the S$819 million invested in manufacturing industries in Singapore in 1973, nearly three fourths was foreign. The contributions of multinational corporations were a major force behind the expansion of manufactured exports, which rose twenty-six times in value between 1960 and 1973. Almost 54 percent of total manufacturing output was exported in 1973, compared with 35 percent in 1960. Expressed as a proportion of GDP, domestically produced exports were 10 percent in 1960 and 50 percent in 1973.

Although Singapore relied extensively on foreign investment, a substantial amount of its own capital was being invested abroad, both privately and publicly. Some may question why Singapore did not rely more on its domestic capital to reduce dependence on foreign investments. The answer is that successful investment requires not merely capital but entrepreneurship, technology, management, and technical skills as well. The capital generated by traders in Singapore could not be easily channeled into manufacturing industries if the owners of the capital were reluctant to exchange their trading mentality for a manufacturing one.

From Import Substitution to Export Promotion

There were two distinct phases in Singapore's development. The earlier period, 1960–67, was marked by political uncertainty and instability from 1960 to 1965 and by the earnest pursuit of import substitution from 1965 to 1967. The later period, 1967–73, was marked by political stability, a policy of export orientation, and the influx of multinational corporations.

The 7.3 percent annual rate of growth of GDP between 1960 and 1967 almost doubled in the second period (1967–73), reaching 13.0 percent a year. In 1967 the rate of unemployment was still 8.1 percent, but it declined to 4.5 percent by 1973. Savings and investment rates in 1967, although much higher than in 1960, were also less impressive than during the subsequent export orientation phase (Table 9.6).

The greatest changes occurred in the manufacturing sector. After a decline during the import substitution phase (from 30.5 percent in 1960 to 28.4 percent in 1967), the share of value added in manufacturing output reached 32 percent in 1973, a rise reflecting the expansion of relatively labor-intensive exports.

There were also considerable shifts in the industrial composition of GNP. In 1960 printing and publishing, beverages, and food processing were the leading industry groups. In 1967 the three largest industry groups were chemicals and chemical products (including petroleum products), food processing, and transport equipment. By 1973 the chemical industry group was still the largest, contributing nearly 20 percent of total value added, followed by electrical machinery and transport equipment.

Export Performance

The policy of export orientation led to rapid increases in manufactured exports. In 1973 almost 54 percent of manufacturing output was exported, compared with 30 percent in 1967. Many industries became significantly more export oriented, as indicated by their 1973 export shares: textiles, 66 percent; footwear, 75 percent; leather, 67 percent; wood, 61 percent; petroleum, 63 percent; nonelectrical machinery, 46 percent; electrical machinery, 90 percent; transport equipment, 43 percent; and miscellaneous products, 44 percent. Among the industry groups, construction, intermediate products I and II, nondurable consumer goods, consumer durables, machinery, and transport equipment had become much more export-oriented in 1973 than in 1967 (Table 9.8).

The operations of multinational firms can be observed particularly in the export performance of the petroleum and electrical machinery industries. The export orienta-

Table 9.7. *Singapore: Composition of Gross Domestic Product, 1960–73*
(factor cost at 1968 prices)

	1960		1967		1970		1973	
	S$million	Percent of GDP	S$million	Percent of GDP	S$million	Percent of GDP	S$million	Percent of GDP
Agriculture and Fishing	87.7	4.1	112.5	3.2	128.5	2.5	143.8	1.9
Quarrying	7.5	0.4	12.1	0.3	19.2	0.4	25.6	0.3
Manufacturing	279.7	13.0	566.3	16.0	1,007.0	19.3	1,628.9	21.9
Electricity, Gas, and Water	53.4	2.5	100.3	2.8	144.9	2.8	199.1	2.7
Construction	79.3	3.7	211.1	6.0	343.0	6.6	418.1	5.6
Wholesale and Retail Trade, Restaurants, and Hotels	713.4	33.0	1,122.0	31.7	1,538.1	29.5	2,075.0	28.0
Of Which, Entrepot Trade	(381.1)	(18.0)	(411.0)	(11.6)	(653.7)	(12.5)	(714.4)	(9.6)
Transport, Storage, and Communication	297.6	13.8	381.5	10.8	593.1	11.4	980.0	13.2
Finance, Insurance, Real Estate, and Business Services	160.7	7.4	309.4	8.7	492.7	9.4	774.6	10.5
Ownership of Dwellings	86.8	4.0	145.5	4.1	223.7	4.3	282.8	3.8
Public Administration & Defense	61.5	2.8	106.8	3.0	193.6	3.7	261.5	3.5
Community, Social, and Personal Services	330.4	15.3	469.9	13.3	530.0	10.1	636.2	8.6
Gross Domestic Product	2,122.3	100.0	3,475.2	100.0	5,107.0	100.0	7,238.8	100.0

Sources: Budget Statement, 1974, Table 1, deflated by GDP deflator for wholesale and retail trade, restaurants, and hotels in Singapore National Accounts, 1960-73.

tion of the latter largely reflects American multinational investments in electronic and electrical products, to be shipped to parent firms and subsidiaries elsewhere.

Retained Imports and Domestic Supply

Industrial policies may also be expected to affect the composition of the domestic supply of manufactured goods, but to establish such a relation requires data on retained imports. Unfortunately, no such data have been published. The estimates for retained imports in 1967 were obtained from the Department of Trade and were used in the calculation of nominal and effective protection rates. For the year 1973, a crude estimate of retained imports was obtained by assuming that retained imports equal gross imports plus domestically produced exports less gross exports.

The estimates are subject to error on several grounds. With respect to the 1973 figures, the data exclude changes in inventories, and no adjustment has been made for differences in valuation; f.o.b. prices were used for exports and c.i.f. prices for imports. The most serious source of error, which applies to 1967 figures as well, is that trade with Indonesia has been excluded from the published data. Imports destined for Indonesia are included whereas imports from and exports to Indonesia are excluded.

The estimated retained imports of manufactured goods amounted to S$7.6 billion in 1973, which was about 13.5 times the 1967 level. The proportion of retained imports in domestic supply also rose, from 34 percent in 1967 to 67 percent in 1973 (Table 9.8). These changes relate to the policy of trade liberalization and the inflow of foreign capital. Thus, although retained imports rose more rapidly than exports, Singapore accumulated foreign exchange reserves.

Evaluation of Incentives

This section presents an evaluation of the various incentives for industrialization in Singapore. Fiscal aids, production aids, miscellaneous aids, and the role played by stability and a climate of confidence in Singapore are discussed in turn, and the effects of the policies applied and policy changes after 1973 are briefly considered.

Fiscal Aids

TARIFFS AND QUOTAS. Prominent among the fiscal aids were tariffs and quotas. As stated earlier, the import substitution phase lasted from 1965 to 1967. On the whole, tariffs were preferred, apparently in recognition of their superior efficiency as an incentive measure; the quotas that were imposed were eventually replaced by tariffs. The legal tariff rates were generally low: 58 percent of the commodities subject to tariff protection had rates of 25 percent or less, and the majority of imports entered duty free. Correspondingly, revenue from protective tariffs was low. In 1967 it amounted to only S$16.5 million, or 3 percent of the value of retained imports.

The low revenue from protective tariffs was partly due to duty exemptions. Exporters were exempted from import duties on all inputs. Other producers could receive duty exemptions on application for the importation of raw materials, intermediate goods, machinery, and other inputs that were not produced domestically. Such exemptions were apparently granted liberally: In 1967, for example, they involved an aggregate remission of duties amounting to S$10.2 million.

The level of nominal protection to manufacturing was low in 1967, at 5 percent for domestic sales and 3 percent for total sales. Widespread tariff redundancy was responsible for this low rate, as indicated by the fact that in the same year legal tariffs averaged 17 percent on domestic sales and 10 percent on total sales.

The level of effective protection was also low, averaging 9 percent on domestic sales, while the effective protection of export sales was nil since exports received free-trade treatment. The overall average of effective protection rates for domestic and export sales combined was 6 percent. There were a few cases of high protection, in particular tobacco and beverages. In turn, among the 70 four-digit industries, 34 had an effective protection rate between 0 and −10 percent and another 12 a rate between 0 and 13 percent.

Among trade categories, effective protection rates on domestic sales were nil on export industries, 8 percent on export-and-import-competing industries, 18 percent on import-competing industries, and −3 percent on non-import-competing industries. With export industries receiving substantial tax and credit incentives, the results change if we consider effective subsidy rates instead. The relevant estimates are: 7 percent for export industries, 5 percent for export-and-import-competing industries, 15 percent for import-competing industries, and −6 percent for non-import-competing industries. For the entire manufacturing sector, average rates of effective subsidies were 1 percent for exports, 8 percent for domestic sales, and 6 percent for total sales.

These calculations have been made at the 1967 rate of exchange, which was affected by measures of protection that led to the overvaluation of the Singapore dollar compared with the free-trade situation. The extent of overvaluation was estimated under alternative assumptions concerning the relevant elasticities, and on the assumption that there was no change in Singapore's

Table 9.8. *Singapore: Retained Imports, Domestic Supply, and Their Ratio, by Two-digit Industry Group, 1967 and 1973*
(thousand Singapore dollars)

SIC Code		1967 Retained Imports	1967 Domestic Supply	1967 Percentage of Retained Imports in Domestic Supply	1973 Retained Imports	1973 Domestic Supply	1973 Percentage of Retained Imports in Domestic Supply
20	Food Manufacturing	72,081	275,986	26.1	865,364	1,352,786	64.0
21	Beverages	13,627	55,089	24.7	59,847	125,708	47.6
22	Tobacco	21,210	101,608	20.9	35,325	156,877	22.5
23	Textile	4,582	9,417	48.7	886,566	977,609	90.7
24	Footwear & Apparel	53,504	67,851	78.9	24,295	100,871	24.1
25	Wood & Wood Products	6,830	68,039	10.0	122,534	299,041	41.0
26	Furniture & Fixtures	1,779	12,582	14.1	6,520	37,492	17.4
27	Paper & Paper Products	13,312	27,805	47.9	164,253	234,984	69.9
28	Printing & Publishing	24,815	85,145	29.1	34,498	172,032	20.1
29	Leather & Leather Products	5,631	11,672	48.2	28,758	38,188	75.3
30	Rubber Products	5,600	27,951	20.0	41,217	85,750	48.1
31	Chemicals & Chemical Products	74,423	148,423	50.1	302,401	472,239	64.0
32	Petroleum Refineries & Petroleum Products	0	252,250	0	365,173	1,175,840	31.1
33	Nonmetallic Minerals	8,346	51,672	16.2	226,454	390,827	57.9
34	Basic Metals	20,860	50,118	41.6	561,717	677,871	82.9
35	Metal Products	69,928	101,738	31.3	234,180	485,102	48.3
36	Nonelectrical Machinery	25,357	28,505	11.0	855,429	959,842	89.1
37	Electrical Machinery, Appliances, & Supplies	21,473	49,800	56.9	1,373,106	1,514,766	90.6
38	Transport Equipment	61,224	142,190	56.9	857,180	1,267,667	67.6
39	Miscellaneous Manufacturing	58,532	83,587	30.0	579,793	790,637	73.3
Total Manufacturing Sector		563,114	1,651,428	34.1	7,624,610	11,316,129	67.4

Sources: Census of Industrial Production and Singapore External Trade, 1967 and 1973.

trade balance. The estimates range from 3 to 9 percent, the median figure being 6 percent.

Adjustment for overvaluation compared with the free-trade situation modifies the estimated incentive rates. Thus, net effective protection is estimated to have averaged −6 percent for exports and 2 percent for production for domestic markets, while the corresponding figures for effective subsidies were −5 and 2 percent. Net protection figures for industry groups and trade categories are shown in Tables 9.9 and 9.10, respectively.

It appears, then, that the extent of discrimination against exports was low in Singapore. Discrimination was further reduced, and eventually eliminated, after 1967, when imports were liberalized and increased export incentives were provided. Thus, the number of items subject to quotas was reduced from 72 in 1967 to 26 in 1969, and to 3 in 1973, and the number of dutiable items was reduced. Exports, in turn, received increased incentives. Tax allowances for marketing expenditures abroad were introduced in 1965 and raised in 1966. More important, in late 1967 the tax rate on profits that approved manufacturing companies earned from exports was reduced from 40 to 4 percent. The application of these measures contributed to the rapid expansion of exports, whereby the share of exports in manufacturing output rose from 30 percent in 1967 to 39 percent in 1970, and to 54 percent in 1973.

The coexistence of protective measures with export incentives from 1967 to the early 1970s may appear anomalous. If matters are viewed in a dynamic context, however, tariff and quota protection may be said to have provided a temporary subsidy to domestic producers while they developed export outlets. Consider the case where a firm cannot break even without exports but would require some time to enter export markets. Import protection would now permit the firm to be established and to break even on domestic sales alone. It should in the meantime be expected to make efforts to sell abroad (for which it would receive a tax deduction). Over time, however, the tariff should be removed since the firm can break even by selling part of its output domestically and part abroad at the prevailing world market price. Since without temporary tariff support the firm would have sustained losses initially, and might not have set up production in Singapore in the first place, the granting of such temporary tariff support might well be socially justified.

This line of reasoning is, of course, a variant of the traditional infant industries argument. However, the "teething troubles" referred to here relate not to technical production problems but rather to the time required to inform overseas buyers of the product's existence and acceptability.

To implement such a policy consistently, the tariff or quota protection should be gradually removed as exports increase; to maintain the incentive to expand exports, the reduction of the tariff or quota should not depend on the producer's success in expanding exports, but should proceed at a pre-announced rate. The most effective instrument would be a direct temporary subsidy to producers; if budgetary limitations preclude such a measure, tariffs or quotas might be used instead. The fact that after 1965 tariffs were frequently reviewed and reduced and quotas were liberalized, coupled with frequent official pronouncements on the need to expand exports, suggests that these considerations affected official thinking.

CORPORATE TAX EXEMPTIONS. Corporate tax policy went through three phases from 1959 to 1973. In 1959, under the Pioneer Industries (Relief from Income Tax) Ordinance, new companies producing viably for the home market or for export could apply for pioneer status, which entitled them to relief from the 40 percent corporate tax for a period of five years. In the same year, the Industrial Expansion (Relief from Income Tax) Ordinance provided tax relief to existing manufacturers who expanded production of approved products. These new measures were clearly intended to promote new investments. Some observers have questioned the efficacy of such tax incentives in attracting foreign investments: "The most striking conclusion of the surveys was that the foreign investors, almost without exception, stated that taxation concessions and pioneer status did not play a significant role, and for the most part, played no role at all, in bringing them to Singapore."[20]

It is questionable whether investors respond accurately to such surveys. Since the United States does not tax the unremitted profits of U.S. subsidiaries abroad, tax exemptions in the country of operation allow such companies to have interest-free loans from the U.S. Treasury. A further consideration is that Singapore competes for foreign investments with Korea, Malaysia, Taiwan, and other places that also offer various tax incentives.

In 1967 the Economic Expansion Incentives (Relief from Income Tax) Act provided, among other things, specific tax relief to approved manufacturing exporters by reducing their corporate tax from 40 percent to 4 percent. The ordinance suggests that the government was well aware of the limits to import substitution imposed by a small domestic market. It also marked the shift in policy toward export orientation. Moreover, the intensification of efforts by the Economic Development Board to attract foreign investors by aggressive promotion brought in multinational corporations whose pro-

Table 9.9. *Singapore: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1967*
(percent)

	Net Legal Tariff		Nominal Protection		Effective Protection			Effective Subsidy			
					Balassa		Corden	Balassa			Corden
	Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Average	Export Sales	Domestic Sales	Average	Average
Processed Foods (II)	0	3	-2	-3	-2	-3	-3	-6	-2	-3	-3
Beverages & Tobacco (III)	112	85	11	8	30	22	21	-13	19	12	11
Construction Materials (V)	15	20	0	0	8	7	5	-11	5	4	3
Intermediate Products I (VIA)	-4	1	-5	-5	-5	-5	-5	0	4	3	3
Intermediate Products II (VIB)	1	5	2	-1	8	3	3	-6	8	3	3
Nondurable Consumer Goods (VII)	-1	3	-3	4	-5	-5	-5	-9	-10	-10	-9
Consumer Durables (VIII)	8	11	5	1	9	4	4	-6	9	3	3
Machinery (IX)	7	6	3	-1	3	0	0	-6	3	0	0
Transport Equipment (X)	-4	1	-4	-5	-8	-7	-7	-7	-9	-9	-9
Total Manufacturing Sector (II, III, V-X)	10	10	-1	-3	2	0	0	-5	2	0	0

Note: Net nominal and effective protection rates for exports are -6 percent.

Table 9.10. *Singapore: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1967*
(percent)

	Net Legal Tariff		Nominal Protection		Effective Protection			Effective Subsidy			
					Balassa		Corden		Balassa		Corden
	Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Average	Export	Domestic Sales	Average	Average
Export Industries	-6	0	-6	-6	-6	-6	-6	0	2	1	1
Export-and-Import-Competing Industries	25	18	2	-1	15	1	1	-8	2	-1	-1
Import-Competing Industries	1	7	1	1	11	10	9	-10	8	8	7
Non-Import-Competing Industries	1	7	-5	-5	-9	-9	-8	-11	-12	-12	-10
Total Manufacturing Sector	10	10	-1	- 3	2	0	0	-5	2	0	0

Note: Net nominal and effective protection rates for exports are -6 percent.

duction was geared primarily toward world export markets.

Some idea of the extent of tax concessions provided to investors may be gleaned from the estimated loss of tax revenue in 1967 of S$27 million. This represented about 17 percent of the total profit of the manufacturing sector.

The export tax incentive had one unintended side effect. Because the volume of export sales was a criterion for the approval of tax concessions, domestic users, particularly other manufacturers who used the products as inputs, were put at a disadvantage. Domestic users in some instances were forced to import their requirements at a higher cost.

The tax incentives may also have encouraged greater use of capital relative to labor. It can be demonstrated that a tax holiday effectively lowers the cost of capital (defined as the implicit rental value of capital services) to the firms enjoying the holiday. The provisions for writing off depreciation allowances against profits in subsequent years had similar effects. Moreover, the granting of pioneer status and tax benefits to existing enterprises was made dependent on the amount invested, and minimum investment requirements were raised further in 1970.

The government loans made initially through the Economic Development Board and later through the Development Bank of Singapore probably reinforced the tendency to use more capital, since loans were frequently granted at rates slightly below the commercial rate. The 1967 Economic Expansion Incentives Act also allowed complete tax exemption on interest received by overseas enterprises or individuals on approved loans advanced to Singapore enterprises for the purchase of capital equipment: "Since the tax liability of overseas enterprises or individuals on such loans is normally borne by the local borrowers, this concession [enables] . . . local industries to obtain loan funds at the lowest cost possible."[21]

Production Aids

Apart from fiscal incentives, the government provided physical and social overhead facilities, namely, industrial sites and infrastructural facilities, technical assistance to industries, and technical training facilities for labor. On August 1, 1961, the Economic Development Board came into being and took over the functions of the former Singapore Industrial Promotion Board. The diverse activities of the board included: underwriting and guaranteeing stocks, shares, bonds, debentures, and loans of industrial enterprises; financing and managing industrial enterprises; developing industrial sites and estates; and granting technical assistance to industries.

In May 1968 the Jurong Town Corporation (JTC) was established to provide industrial sites and facilities that were previously handled by the EDB. By 1973 JTC had developed 2,110 hectares of industrial land, 1,719 of which were in Jurong Town and the rest in sixteen other industrial estates. In Jurong Town alone, 504 factories were in production by the end of 1973. Annual rentals were calculated at 6 percent of the price of land per square meter and leases were granted for up to sixty years. JTC also provided standard factory buildings, in which floor space ranged from 870 to 3,252 square meters, which could be purchased or rented out at reasonable rents. Furthermore, since Jurong is located on the southwest side of the island, JTC built apartments for workers at low rentals. Jurong Town also has its own port and recreational facilities, all built by JTC.

Several programs provide technical assistance to industries:

- The Singapore Institute of Standards and Industrial Research (SISIR) conducts industrial research and maintains quality and standards. Before 1969 SISIR was a division of EDB.
- Advisory and consultancy services in the fields of industrial engineering, general and personnel management, management accountancy, and low-cost automation are provided by the National Productivity Board (NPB), which was set up in May 1972 to take over the functions of the National Productivity Centre (set up in 1967 under the EDB).
- Starting in 1965, a number of workshops and engineering development services were organized by the EDB, largely with the assistance of U.N. agencies. From April 1968 the workshops were administered by the Engineering Industries Development Agency (EIDA). Because the subsidies for each worker trained had become inordinately large, the agency was transformed into a private company in June 1973.
- The Technical Education Department was established in June 1968 and became the Industrial Training Board in April 1973. Some 6,400 students were enrolled at the board's various institutes as of March 1974. In addition to such technical training, school curriculums were reformed in 1969 to make technical education more responsive to the demands of industrialization.
- Various labor training schemes and centers were introduced and supervised by the EDB.

In sum, the physical and social overhead facilities provided by the Singapore government were considerable. They responded to industrial needs and lowered the costs to firms of production and training.

Miscellaneous Measures

No data are available to assess the impact of preferential purchases by government. (Government departments were instructed to buy from domestic suppliers whenever possible, provided that the prices were no more than 10 percent higher than those of comparable imports.) These purchases involved a subsidy, but, since Singapore's imports come from all over the world, the comparison was based on prices from the lowest-cost source.

Another incentive measure was the loan and equity financing of industries by government. When the EDB was established in 1961, it was provided with a S$100 million capital grant to finance loans and equity participation in industry. By 1967 total loans disbursed amounted to S$55 million and equity participation amounted to S$20 million.

Firms could borrow up to 50 percent of their fixed capital requirements for up to ten years, provided that the sum borrowed did not exceed their paid-up capital. The interest rate on loans to industry financed by EDB was initially 7 percent. It was reduced to 6 percent in 1963 and raised to 8 percent in August 1965. On the whole, the availability of long-term financing, and perhaps EDB's less stringent standards of creditworthiness, were more important in the board's lending than the interest rate itself. From August 1968, the financing functions of the EDB were taken over by the Development Bank of Singapore (DBS).

The government's equity participation in the manufacturing sector was concentrated in a few industries that needed large-scale investment. The government had a 10 percent interest in the joint venture established in 1963 with Ishikawajima-Harima Heavy Industries of Japan. National Iron and Steel Mills Ltd. was established a year earlier with 30 percent government equity. The government exercised its direct equity participation under the name of Minister for Finance Incorporated and, more recently, under the Temasek Holding Company. Indirect government ownership existed through statutory boards such as EDB, Port of Singapore Authority, Jurong Town Corporation, Housing and Development Board, Singapore Tourist Promotion Board, or the Public Utilities Board, and government-controlled entities such as INTRACO, a trading company.

In 1972 government equity investments in manufacturing and in service companies were estimated at S$178 million and S$143 million, respectively. Available data for the thirty-eight publicly owned enterprises in manufacturing show that these enterprises contributed 11 percent of total manufacturing output, 15 percent of value added in manufacturing, and 13 percent of employment in manufacturing.[22] The government-owned enterprises had a mixed record of profits and losses during 1970–74. Some companies that incurred losses went bankrupt.

Apart from initiating the financing of Singapore industry, the EDB served an even more important function, that of investment promotion. Investment promotion activities were geared toward attracting foreign investors. A network of offices and representatives abroad was established for this purpose, and by 1964 the EDB had representation in Australia, Hong Kong, India, Japan, Thailand, the United Kingdom, and the United States. The EDB provided the requisite information to potential investors, handled industrial visitors, and expedited all immigration, housing, and factory facilities. Its ability to cut through red tape and its projection of Singapore as a haven for investment with political stability and an energetic, businesslike government probably did much to sell Singapore to foreign investors.

Stability and Climate of Confidence

Industrial success in Singapore owed much to political and social stability, which helped to engender a climate of confidence. Uncertainty about political stability tends to shorten the time horizon of potential investors and to increase the rate of return they consider necessary to cover risks and uncertainty. The electoral defeat of the communists and leftist elements in 1963 and the achievement of independence in 1965 probably were the most important factors to raise the confidence of investors. With the defeat of the left came industrial peace.

The stringent labor legislation of 1968 has been described as a draconian measure by some observers and as an unnecessary infringement of workers' rights by others. At that time, however, the overriding necessity was to project a climate of stability and to counter the earlier image of an undisciplined work force and an irresponsible trade union movement. The increased industrial discipline has paid off in attracting capital to Singapore.

Concluding Remarks

Our review of Singapore's development and trade policies from 1960 to 1973 indicates that, even during the import-substitution phase between 1965 and 1967, protection levels were much lower than in other developing countries. Moreover, by the end of 1967 public policy had already recognized the constraints imposed by the small scale of the Singapore economy and the

inefficiencies of an import-substitution strategy. The subsequent switch to export orientation together with the encouragement given to multinational corporations brought rich dividends in the form of improved economic conditions.[23]

Unemployment virtually disappeared; instead, immigrant labor became necessary. With exports rising rapidly, the annual average growth rate of real GNP in the export-orientation phase was 13 percent, which was substantially higher than the 7.3 percent growth rate in the import-substitution phase. The economy shifted from dependence on entrepot trade toward manufacturing. In 1973 manufacturing contributed 22 percent of GDP compared with only 13 percent in 1960. In addition, there was a quantum jump in savings and investment rates. Investment as a percentage of GDP rose from 9.5 percent in 1963 to 33 percent in 1973, while the savings rate rose from 8 to 25 percent.

Export promotion has been emphasized further. Although Singapore spent less than US$1 million on export promotion in 1973, compared with US$14 million by Hong Kong, in subsequent years the Ministry of Finance and the Singapore Manufacturers' Association have jointly sent trade missions abroad. In October 1974 the government allocated S$100 million for financing export bills at 0.25 percent below the prime interest rate and for financing manufacturers who wished to expand their capital equipment for export production. Another move to encourage exports was the establishment of the Export Credit Insurance Corporation, Singapore, Ltd. in November 1975. The government contributed 50 percent of the capital; the rest came from commercial banks and insurance companies. The purpose of the corporation is to insure exports and reexports against defaults on either commercial or political grounds.

In August 1975 an Amendment to the Economic Expansion Incentives (Relief from Income Tax) Act was introduced in Parliament to support the drive for higher technology industries: "Industries such as machine tools, diesel engines, precision instruments, aircraft components, specialized electrical equipment and industrial machinery involve much heavier capital investments and require more sophisticated manufacturing skills which are only acquired after long periods of training. Such industries have long gestation periods and take much longer time to become profitable."[24] Correspondingly, the period of pioneer status was extended from five to ten years. In addition, the minimum requirement of S$1 million of capital was removed so as to encourage supporting industries that involve sophisticated technology and skills but that are small in size.

In the future Singapore will have to meet what may be described as a sandwich problem. On the one hand, it faces growing competition from other developing countries in low-technology industries. Foreign firms that established themselves in Singapore because of its low wages might be tempted to move elsewhere when wages rise significantly, which will happen in the course of development because Singapore's capacity to absorb immigrant labor is physically limited. On the other hand, Singapore faces competition from developed countries in high-technology industries.

Thus, the next stage of Singapore's industrialization efforts will prove to be more difficult. The easy phase of surplus-labor absorption by relatively labor-intensive industries is over. The next phase demands higher skills and technology. Areas other than manufacturing merit attention, and the development of financial, professional, and management services for exports may hold some promise.

Notes to Chapter 9

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5. Lee Soo Ann, *Industrialization in Singapore* (Melbourne, Australia: Longman, 1973), p. 94.
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7. Excise taxes were imposed on the domestic output of petroleum products at the same rate as the duties levied on imports.
8. Except for three industries—sauces (2032), bakery products (2062), and tire retreading and repairs (3023)—for which implicit tariffs were not available. For the first two industries, the nominal protection rates were equated with their legal rates, whereas for the last industry the nominal protection rate was assumed to be zero since it is an export industry.
9. Except for sauces (2032). Its nominal protection rate was equated to legal tariff since the implicit tariff was not available.
10. The commodities subject to quotas accounted for the following percentages of output value in the first three industries: 29 percent for 3099, 35 percent for 3195, and 19 percent for 3199.
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10

Taiwan

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Situated on the edge of Asia's continental shelf, the island of Taiwan is about 90 miles east of the coast of China and 200 miles north of the Philippine Islands. It has a total land area of 13,885 square miles, predominantly mountainous, of which less than one third is arable, and its mineral resources are generally meager.

Taiwan became Chinese territory many centuries ago, but between 1895 and 1945 it was occupied by Japan. Under the premise that Taiwan's economic role lay in agriculture, the Japanese colonial regime transformed the island into a productive agricultural colony that became a major source of food for Japan. The colonial regime from the outset made substantial investments in infrastructure and undertook extensive research on seed improvements and application of fertilizers. The improved methods of production were extended to farmers through a network of agricultural associations, and were complemented by irrigation and water control. The early period of Japanese rule also saw the introduction of modern technology in agricultural processing, especially in sugar manufacturing. To increase Japan's military potential in the 1930s, efforts were made to develop such industries as cement, bagasse pulp, chemical fertilizers, aluminum and copper refining, and petroleum refining.

After World War II the island was restored to China as a province, but subsequently became politically and economically separate. In the period following the separation, Taiwan faced considerable obstacles to its economic development. First, population increased at a rapid rate, both because of migration from China and because of a natural rate of increase (over 3 percent a year) that was among the highest in the world. By 1963 population density had reached 332 persons per square kilometer. Second, the island economy was too small to accommodate industrialization oriented toward the domestic market, and the expansion of traditional primary exports was limited by the rapid rate of population growth and by land availability. Third, the large defense establishment competed with development projects for scarce resources; according to one estimate, military expenditures averaged 9 to 11 percent of GNP during 1951–65.[1] Fourth, the abundant supply of money, swollen by transfers from China, as well as imbalances in the demand for and supply of many essential goods, led to rapid inflation during the period immediately after World War II.[2]

As can be seen in Table 10.1, manufacturing activity accounted for 11 percent of GDP in 1952, while 37 percent of GDP originated in the primary sectors. In 1955, largely because of Taiwan's separation from China and its changing relations with Japan, exports accounted for only 7.5 percent of GNP, and the share of manufactured exports in total exports was only 7.6 percent. Economic development from the end of World War II through the 1950s was characterized by efforts to promote growth in the agricultural sector coupled with import-substituting industrialization. The share of manufacturing in GDP increased to 17 percent in 1960. With rapid increases in output, employment in manufacturing maintained a 4.8 percent annual growth rate throughout the 1950s.

The way was gradually paved for the second stage of

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development, characterized by outward orientation, that followed the major policy shifts to be discussed in detail in the following section. Tables 10.1 and 10.2 show that economic performance in the 1960s and early 1970s had greatly improved in comparison with that of the 1950s. Manufactured export growth coupled with rising domestic demand accelerated industrialization. The average annual growth of manufactured output increased from 11 percent in 1955–60 to 14 percent in 1960–65 and then to 21 percent in 1965–70. The share of manufactured products in total exports rose from 28 percent in 1960 to 77 percent in 1970.

With the rapid development of labor-intensive export industries, economic growth became more labor absorptive than before. Manufacturing employment rose at a rate of 8.3 percent a year in 1965–70 while real wages in this sector increased at a rate of 6.5 percent. Despite the oil crisis and the world recession of 1974–75, rapid economic growth continued during the 1970s. In 1952–76 GNP grew at an average annual rate of 7.9 percent, and GNP per capita at 4.8 percent, which was a remarkable performance among developing countries.

The important role of incentive policies in accelerating Taiwan's economic transformation is the principal subject of this chapter. The first section provides a brief history of Taiwan's successful transition from its initial import-substitution strategy to a strategy oriented toward export expansion. The next two sections discuss in detail the estimates of nominal and effective incentive rates among sixty-one sectors for 1969. Export performance and structural change are then described and quantified, and the changes in factor allocation and use are examined. The final section summarizes the major findings of the study and discusses possible lines of future development and desirable policy changes.

Incentive Policies for Import Substitution and Export Expansion

The incentive policies applied through 1958 were based on an import-substitution strategy. In the process of industrial development, primary emphasis was given to the protected domestic market; a multiple exchange rate system and strict import controls were in force.

The first and relatively easy phase of import substitution, however, soon reached its limit in the confines of the narrow domestic market. It was recognized that only an outward-looking or export-oriented industrialization policy could sustain a high rate of economic growth in a small island economy such as that of Taiwan, and a series of policy reforms was undertaken during 1958–61. The greatly overvalued currency was devalued, and the complicated exchange rate structure was simplified and finally unified in June 1961. Laws and regulations governing investment and imports were liberalized. The emphasis of trade policy shifted from import controls to export promotion. This section briefly summarizes the shift in incentive policies in roughly chronological order.

Inward-oriented Growth, 1949–58

With the changing situation in China and the loss of major outlets in Japan, ready markets for such primary products as sugar, rice, bananas, canned pineapple, and tea were no longer available. As a result, Taiwan suffered severe foreign exchange shortages and rapid inflation during the late 1940s. Measures to reconstruct the economy began to be introduced in 1949, the year of separation from China, and included land reform, currency reform, and inward-oriented trade policies.

The main features and contributions of the land reform and related policies of 1949–53 can be summarized as follows:[3] First, since tenant farmers had assumed managerial responsibility for their farm operations even before the land reform, the implementation of the land reform program did not affect the size of farm operational and management units. Perhaps the most important aspect of the land reform was its positive effect on incentives; multiple-cropping was adopted, and there was a subsequent rapid growth in the productivity of land. The successful development of diversified farming and the use of new inputs, adopted by an educated and suitably motivated farm population, ensured an adequate supply of food for Taiwan's rapidly growing population. Furthermore, agricultural and processed agricultural exports continued to dominate the island's growing exports throughout the 1950s.

Second, landlords were duly compensated. Of the total compensation based on the selling price, which was judged to be 2.5 times the annual main crop yield, 70 percent was paid in land bonds redeemable in kind over a ten-year period and carrying a 4 percent rate of interest. The other 30 percent was paid in stocks of several public enterprises.

Third, land reform and the consequent expansion of agricultural output contributed to Taiwan's industrial development in many ways. Increased demand for inputs and consumer goods and rising and more evenly distributed incomes provided a powerful stimulus to industrial expansion at the initial stage of development when industry was inward oriented. Taiwan's industry also enjoyed a continuous net inflow of capital from agriculture through government taxes and other direct and hidden levies.[4]

Fourth, by removing distortions inherent in certain tenancy contracts, the land reform not only helped to equalize the distribution of income within agriculture,

Table 10.1. *Taiwan: Major Economic Indicators, 1952–76*

	1952	1955	1960	1965	1970	1975	1976
Computation of per Capita Income							
GNP (NT$ million at 1971 prices)	58,070	73,429	97,450	149,640	235,121	324,048	362,459
Population (thousand)	8,128	9,078	10,792	12,628	14,676	16,150	16,508
GNP per Capita (NT$ thousand at 1971 prices)	7.1	8.1	9.0	11.8	16.0	20.1	22.0
Percentage Shares of GDP (factor cost, at current prices)							
Primary Production	36.9	33.4	33.6	27.8	18.2	16.8	15.3
Manufacturing	11.2	14.2	17.3	20.7	26.7	28.5	29.9
Social Overhead a/	9.6	10.4	11.0	12.1	15.1	15.1	15.1
Services	42.3	42.0	38.1	39.4	40.0	39.6	39.7
Percentage Shares of GNP (at 1971 prices)							
Government Revenue	21.8	24.8	23.8	20.7	25.9	27.5	28.9
Government Savings	3.7	5.0	3.9	2.2	0.9	0.7	1.1
Total Domestic Savings	2.7	3.7	8.1	14.7	24.8	43.9	53.7
Gross Capital Formation	8.5	9.2	14.1	19.2	25.6	29.8	27.6
Exports of Goods and Services	8.5	7.5	10.3	15.0	27.2	39.2	46.3
Imports of Goods and Services	15.9	11.8	15.3	17.5	27.4	38.6	44.5
Manufactured Exports							
Manufactured Exports (NT$ million) b/		144	1,688	7,785	43,604	163,528	263,608
Manufactured Exports as Percentage of Total Exports		7.6	28.2	42.6	76.7	81.3	91.2

a/ Construction; electricity, gas, and water; transport, storage, and communication.
b/ SITC categories 5 through 8.

Sources: Directorate-General of Budget, Accounting and Statistics, National Income of the Republic of China; Economic Planning Council, Taiwan Statistical Data Book; Department of Statistics, Ministry of Finance, Monthly Statistics of Exports and Imports, The Republic of China; Research, Development, and Evaluation Commission, Commodity Trade Statistics of the Republic of China (SITC Revised), 1954-74 (August 1976); Overall Planning Department, Economic Planning Council, Research Report, no. (66) 120.119 (July 1977).

Table 10.2. *Taiwan: Structural Change, 1952–76*
(compound annual percentage growth rates)

	1952–55	1955–60	1960–65	1965–70	1970–75	1975–76	1952–76
GNP (at 1971 prices)	8.0	5.8	8.9	9.4	6.6	11.8	7.9
GNP per Capita (at 1971 prices)	4.5	2.1	5.6	6.3	4.7	9.4	4.8
Index of Manufacturing Output	16.7	10.9	13.8	20.6	13.5	25.7	15.3
Total Exports (at 1971 prices)	3.7	12.7	17.4	23.3	14.7	32.0	15.8
Population Under 15; 65 and Over	4.5	4.4	3.0	0.8	0.05	0.8	2.3
Employment							
Total	1.2	2.1	2.3	4.3	3.8	2.5	2.9
Manufacturing	4.8	4.8	5.3	8.3	9.9	7.1	6.8
Agriculture	0.4	0.6	0.5	-0.7	-0.3	-0.2	-0.1
Real Wages in Manufacturing	5.6	-0.1	5.5	6.5	7.8	13.9	5.3
Prices							
GNP Deflator	11.1	9.1	1.1	5.1	11.2	4.8	7.1
Wholesale Price Index	8.3	9.0	2.0	1.9	11.4	2.8	6.1

Sources: As in Table 10.1.

but also stimulated demand for the formation of human capital. Increased incomes made possible by land reform lowered the cost barriers to education. Furthermore, by placing scarce land in the hands of the cultivators, the land reform helped to ensure that they benefited from education and used their knowledge of new agricultural practices. Land reform thus laid a broad base for economic development. The role played by Taiwan's agriculture contrasts with the experiences of many other developing countries, where the backwardness of agriculture has hindered industrial and general economic development.

Taiwan also benefited from a substantial aid program. Without U.S. aid, Taiwan's trade gap would have seriously limited its economic development in the early post–World War II period. U.S. aid augmented the country's foreign exchange resources, sustaining the import of necessary inputs that complemented domestic labor and other capital. U.S. aid continued to supply more than 30 percent of total imports until 1961, but declined rapidly thereafter.[5]

The currency reform of June 1949 consisted of several measures. A new currency named the New Taiwan dollar (NT$) was issued with 100 percent reserves made up of gold, silver, foreign exchange, and export commodities; the exchange rate was pegged at NT$5 to US$1; the maximum amount of currency issue was limited to NT$200 million;[6] the old currency was convertible to New Taiwan dollars at the rate of 40,000 to 1; a stabilization fund was established to support the currency value by selling gold and foreign exchange; and 20 percent of export earnings was to be settled at the Bank of Taiwan in New Taiwan dollars, while 80 percent was paid with foreign exchange certificates that could be sold in the market or used to import goods.

Because of government budget deficits and the easy credit granted to public enterprises, the currency issue exceeded the prescribed limit of NT$200 million by early 1950 and continued to increase thereafter. The resulting inflation forced the government to devalue the exchange rate repeatedly, and, in an effort to deal with recurrent balance of payments difficulties, the single rate was abandoned in favor of multiple rates. Foreign exchange rates varied with the type of import and the source of foreign exchange, and importers were required to make advance deposits of 100 percent of the domestic currency equivalent of foreign exchange.

Exports of sugar and rice received a relatively unfavorable exchange rate as part of the government's system of taxing farmers. A tax in the form of a higher exchange rate was applied to imports other than those of basic raw materials and industrial products financed from U.S. aid and imports by government enterprises at controlled prices. In addition, high tariffs were levied on many finished goods and luxury items, and imports were severely restricted by a licensing scheme.

In September 1953 the government introduced a performance record system as the basis of exchange allocation. Each importer was given the right to receive foreign exchange on the basis of its export performance, while the cost of foreign exchange was raised by imposing a 20 percent defense tax on exchange settlements. The performance record system gave rise to a number of unnecessary imports and failed to take account of the needs of new industries. Furthermore, under the strict foreign exchange and import controls, the recipients of import licenses enjoyed substantial premiums over the duty-inclusive import costs of many industrial materials and consumer goods. For instance, in 1953 wheat flour commanded a premium of 48 percent, soybeans 141

Table 10.3. *Taiwan: Real Effective Exchange Rates for Exports, 1956–76*

	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
A. Official Exchange Rate for Exports a/ (NT$ per US$)	24.71	25.53	34.14	39.38	39.73	39.83	39.83	39.87	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	38.16	37.90	37.95	37.95
B. Incentives (NT$ per US$ of Exports)																					
Interest Subsidy b/	0.00	0.005	0.017	0.021	0.031	0.038	0.086	0.086	0.06	0.073	0.083	0.077	0.096	0.10	0.093	0.01	0.095	0.074	0.053	0.083	0.076
Customs Duties Rebate c/	0.21	0.22	0.50	1.22	1.69	1.87	2.23	2.48	2.69	2.97	3.24	3.49	3.37	3.48	4.06	4.27	3.68	2.82	2.47	2.7	2.14
Indirect Tax Rebate d/	0.01	0.06	0.15	0.36	0.68	0.97	1.00	0.77	0.92	1.07	1.07	1.19	1.23	1.27	1.36	1.34	1.24	0.98	0.87	1.12	0.89
Subtotal	0.22	0.285	0.667	1.601	2.401	2.878	3.316	3.336	3.67	4.113	4.393	4.757	4.696	4.85	5.513	5.71	5.015	3.874	3.423	3.903	3.106
C. Nominal Effective Exchange Rate (A+B)	24.93	25.82	34.81	40.98	42.13	42.71	43.15	43.21	43.67	44.11	44.39	44.76	44.70	44.85	45.51	45.71	45.02	42.03	41.32	41.85	41.06
D. Taiwan's Wholesale Price Index (1960 =100)	72.79	78.11	79.56	88.39	100.00	103.14	106.41	113.18	114.99	110.25	112.21	114.99	117.90	118.26	120.92	121.52	128.17	155.50	218.62	207.50	213.20
E. Average Wholesale Price Index of Major Trading Partners e/	98.77	102.63	97.30	98.54	100.00	101.10	100.93	104.34	103.93	105.36	110.40	114.18	113.57	117.90	122.64	126.01	130.53	146.96	187.49	201.88	201.20
F. Exchange Rate Index f/	78.70	79.67	89.24	95.84	100.00	96.80	96.71	93.76	95.79	94.55	90.26	86.18	91.50	90.32	90.80	90.79	95.47	98.20	84.48	83.79	99.88
G. Real Effective Exchange Rate for Exports (C/D x E x F)	26.62	27.03	37.99	43.79	42.13	40.53	39.58	37.35	37.81	39.85	39.42	38.30	39.39	40.38	41.91	43.04	43.77	39.00	29.94	34.12	38.81

a/ Where the rates fluctuated over a period, the mean of the range was taken. The rate up to April 14, 1958, was that applicable to exports by private enterprises. Therefore, until September 30, 1963, it was the rate applicable to all exports other than a few commodities (for example, sugar, rice, salt, bananas) for which lower rates applied. The same rate applied to all exports after September 30, 1963. See M. Scott, "Foreign Trade," in Economic Growth and Structural Change in Taiwan: The Postwar Experience of the Republic of China, ed. W. Galenson (Ithaca, N.Y.: Cornell University Press, 1979), Table 3.

b/ The difference in the interest on export loans and that on unsecured loans is treated as an export subsidy. The interest subsidy is estimated by multiplying outstanding export loans with the interest differential.

c/ Includes defense surtax and harbor dues.

d/ Includes commodity tax, salt tax, and flood rehabilitation surtax.

e/ An average of wholesale price indexes in Australia, Canada, West Germany, Hong Kong, Japan, Korea, Netherlands, Singapore, United Kingdom, and the United States, weighted by Taiwan's annual export value with the respective countries.

f/ An average of the exchange rate index weighted by Taiwan's annual export value with its partners.

Sources: DGBAS, Commodity-Price Statistics Monthly, Taiwan District, the Republic of China; IMF, International Financial Statistics; Economic Research Department, the Central Bank of China, The Republic of China, Taiwan Financial Statistics Monthly; and Department of Statistics, Ministry of Finance, Yearbook of Financial Statistics of the Republic of China.

percent, cotton yarn 33 percent, cotton piece goods and poplin 152–163 percent, woolen yarn 350 percent, soda ash 275 percent, ammonium sulfate 102 percent, and steel plate 35 percent.[7]

In March 1955 the performance record system was replaced by a quota system for commodity imports. Importers were obliged to purchase a stipulated percentage of exchange certificates from the banks or from exporters to supplement the foreign exchange obtainable at the official rate.

The multiple exchange rate system and tariff and nontariff protection made import substitution more profitable and were partly responsible for the doubling of manufacturing production during 1950–58. The import-substitution strategy, however, had its adverse effects.[8] Implementing a complicated system of multiple exchange rates imposed considerable administrative costs. Also, the system of foreign exchange allocation discriminated among categories of commodities without an economic rationale, induced entrepreneurs to compete for licenses rather than to lower production costs, and encouraged corruption. At the same time, the preferential allocation of undervalued foreign exchange for imported raw materials and capital equipment created incentives to expand capacity even when existing capacity was not fully used. The squeeze on agriculture through the allocation of foreign exchange also depressed the incomes and consumption of farmers.[9]

Import substitution was a self-limiting process, and the growth rate of GNP decelerated during 1955–60, as shown in Table 10.2. Also, the industrial survey for 1959 indicates that many plants producing simple manufactures were operating at low levels of capacity utilization. They included those producing rubber and canvas shoes (23.3 percent), electric fans (38.1 percent), soap (39.2 percent), insulated wire (40.0 percent), plywood (46.9 percent), synthetic fabrics (49.7 percent), woolen yarn (52.6 percent), sewing machines (64.3 percent), iron rods and bars (65.4 percent), and paper (67.4 percent).

In July 1955 the government had promulgated the Regulations for Rebate of Taxes on Export Products, which provided for the rebate of import duty, defense surtax, and commodity tax to encourage the processing of imported materials for export. This did not prove sufficient, however, to promote exports. Correspondingly, as the government began to recognize that only export-oriented industrialization could sustain a high rate of economic growth in such a small island economy as Taiwan, a series of major policy reforms was undertaken during 1958–60.

Outward-oriented Growth, 1958–76

The promulgation of the Program for Improvement of Foreign Exchange and Trade Control in 1958 marked the beginning of a new era. The government devalued the greatly overvalued currency and replaced the multiple exchange rate system with a basic official exchange rate and an exchange certificate rate. Export proceeds and remittances were exchanged for certificates that were transferable and that represented full import rights. The exchange certificate rate was determined by market demand and supply; it was stabilized at NT$40 to US$1 by August 1958. The basic official exchange rate and the exchange certificate rate were subsequently merged at this level in June 1961. The new unified and stable exchange rate not only simplified the administration of foreign exchange, but also assured exporters of reasonable earnings free from exchange uncertainties.

Table 10.3 shows changes in the real effective exchange rate for exports, which is defined as the official exchange rate of New Taiwan dollars for each U.S. dollar of exports, adjusted for changes in export incentives, in wholesale prices in Taiwan and abroad, and in the exchange rates of Taiwan's major trading partners. The estimates of export incentives include only interest subsidies and rebates of customs duties and indirect taxes.

The estimates clearly show that the repeated devaluations during the period of policy reform, together with the export incentives and relative domestic price stability, substantially increased the real effective exchange rate for exports in the late 1950s and kept it fairly stable during 1958–73. The real effective exchange rate was particularly favorable for exports during 1959–60 and 1971–72. The high and fairly stable real effective exchange rate led to accelerated export expansion after the policy reforms.

The 1958 reform also aimed at reducing tariffs and abolishing controls on foreign exchange allocation. The government gradually liberalized and finally abolished the commodity import quota system. The restrictions on imports of materials and equipment to be used for exports were substantially eased and subsequently eliminated. As a result of reductions in tariffs, the ratio of net customs revenues (including import duty, defense surtax, and harbor dues) to total imports declined from 42.3 percent in 1955 to 28.1 percent in 1960, 22.0 percent in 1965, 18.0 percent in 1970, and 13.6 percent in 1976.[10]

Import controls were liberalized from the early 1960s onward. Domestic manufacturers seeking protection had to show that the quantity and quality of their products were adequate to satisfy domestic demand, and that the cost of imported raw materials did not exceed 70 percent of total product costs. Also, the exfactory price of the controlled commodity was not allowed to exceed the prices of comparable imports (inclusive of all duties) by more than 25 percent in 1960. In 1964 this ratio was reduced to 15 percent, in 1968 to 10 percent, and in 1973 to 5 percent.

Table 10.4. *Taiwan: Changes in the Classification of Various Categories of Importables, 1956–69*

	1956	1961	1966	1969
Number of Commodity Categories	672	771	771	771
Commodity Categories Containing Items Subject to Import Control	398	460	471	448
Commodity categories containing only items subject to import control	347	327	304	288
Of which, with average tariff rates higher than 30 percent	276	260	233	220
Commodity categories containing controlled as well as uncontrolled items	51	133	167	160
Uncontrolled Imports	274	311	300	327

Source: The Foreign Exchange and Trade Commission, Classification of Import and Export Commodities of the Republic of China (various editions).

Although changes in the number of items falling into the different categories provide only a crude indication of changes in the extent of import control, the data in Table 10.4 show a tendency toward trade liberalization during the period considered. The number of commodity categories consisting wholly of items subject to import control, as well as those subject to average tariff rates higher than 30 percent, have decreased since 1956.

In May 1967 the advance deposit required for ordinary imports on the date of the letter of credit was reduced from 100 to 50 percent. It was further lowered to 10 to 30 percent in August 1969.[11] The interest burden of importers was thus substantially reduced.

The emphasis of trade policy shifted gradually from import controls to export promotion after the 1958 reform. The new export incentives comprised rebates of customs duties (including defense surtax and harbor dues) and commodity tax on imported raw materials;[12] exemption from business and related stamp taxes; a deduction of 2 percent of annual total export earnings from taxable income, and a 10 percent tax reduction for manufacturing, mining, or handicraft corporations that exported more than 50 percent of their output;[13] provisions for the retention of foreign exchange earnings to import raw materials and machinery, together with the privilege of selling such rights to other firms;[14] special low-interest loans for working capital to finance the production of exports, and financing for imports of raw materials; and export insurance by a government organization.

Encouraged by the government, manufacturers formed trading organizations—as in the case of textiles, canned mushrooms, canned asparagus spears, and citronella oil—that controlled production and exports by means of export quotas and the quotation of unified export prices. Manufacturers' associations financed direct subsidies to exports in a few industries, such as cotton spinning, steel and iron, rubber products, monosodium glutamate, woolen yarn and fabrics, and paper and paper products. These subsidy schemes amounted to private levies on domestic sales or on materials used in manufacturing for domestic sales, with corresponding subsidies to exports.[15]

Export promotion facilities provided by government and semigovernment agencies included export inspection, managerial, technical, and trade consultation services, market research, and participation in international trade fairs. The China External Trade Development Council was founded in July 1970 to promote exports and to conduct market research. The council exacted a

levy of 0.0625 percent on export revenue to finance the United Funds for Promotion and Extension of Exports.[16]

From 1965 onward exports were also assisted by the establishment of three duty-free export processing zones that encouraged investment in the processing and assembly of such exportables as electronic products, garments, and plastic products. The Export Processing Zone Administration simplified procedures for registration, import and export licensing, and foreign exchange transactions. Exports from the three zones in 1975 amounted to US$453 million and imports were US$256 million, representing 8.5 percent and 4.3 percent, respectively, of Taiwan's total exports and imports. Employment in the three zones amounted to 66,115 persons, or 4.4 percent of total employment in manufacturing, in 1975.[17]

In addition to the changes in foreign exchange and trade policies, there were several key reforms aimed at improving the investment climate. Laws and regulations governing investment were liberalized. New industrial establishments eligible under the Statute for the Encouragement of Investment were given a five-year tax holiday from the starting date of operation and were exempted from import duties on machinery and equipment.

Among the measures to encourage financial growth, the most important was the offer to savers of a positive real rate of return, which amounted to about 10 percent during much of the period. Also, financial deepening increased as the wholesale price index stabilized in the 1960s. The ratio of the broadly defined money supply (M_2) to GDP increased from 12 percent in 1952–55 to 39 percent in 1966–70, while M_2 deflated by the wholesale price index, representing the real lending capacity of the organized banking sector,[18] grew twelve times during this period. These measures contributed not only to rapid financial growth but also to the rise of net private savings, from 4.6 percent of national income in 1952–55 to 15.4 percent in 1966–70.

In the favorable investment climate created by government policies, industry underwent radical changes, aided also by an abundant and efficient labor force. Manufactured exports expanded rapidly. As a result, rates of capacity utilization improved to a considerable extent. In the industries referred to earlier, capacity utilization rates reached 80 to 90 percent, and were highest for woolen yarn (100 percent) and for iron rods and bars (98.7 percent).

Outward orientation has been a highly successful strategy in Taiwan. The expansion of manufactured exports has contributed to efficient industrialization by permitting specialization according to comparative advantage and by stimulating technological improvement. It has led to rapid economic growth, and it has improved income distribution through the creation of productive employment and rapid increases in wages.

After 1973, however, disturbances emanating from abroad, shortages of raw materials, and the quadrupling of petroleum prices, disrupted the Taiwanese economy and contributed to inflation. To cope with the situation, the government introduced an economic stabilization program on January 27, 1974. It tightened credit through a large-scale upward adjustment of bank rates and substantially raised prices for government-controlled goods and services such as petroleum products, electricity, transport services, and alcoholic beverages and tobacco.

These measures produced the desired effect. After increasing sharply in late 1973 and early 1974, the price level stabilized. Furthermore, the upward adjustment of bank rates not only forced enterprises to reduce their inventories but also curtailed consumer demand and encouraged savings. The subsequent decline in the prices of raw material and food imports and the growing government budget surplus were also helpful to economic stabilization.

Because inflation in Taiwan proceeded more rapidly than abroad and the exchange rate in terms of the U.S. dollar appreciated 5 percent in February 1973, the real effective exchange rate deteriorated sharply in 1974 (Table 10.3). Export incentives were also reduced during this period. A program under which exporters could borrow for working capital against a credit line based on their previous year's trade performance was discontinued in January 1974. Furthermore, preshipment preferential export credit to finance working capital needs was limited to exports under letters of credit, and stricter rules were applied to rebates on customs duties.

The deterioration in real effective exchange rates made exports less profitable and aggravated the economic slowdown created by the world recession. The real effective exchange rate for exports increased again after 1974, largely because of the containment of domestic inflation by the economic stabilization program. As a result, the commodity trade balance swung from deficits of US$1,327 million and US$643 million in 1974 and 1975, respectively, to a surplus of US$567 million in 1976.

Taiwan and other economies pursuing outward-oriented policies were able to weather the recession better than those having inward-oriented policies. In the future, it would be desirable to continue outward orientation in Taiwan. To do so it would have to upgrade its traditional unskilled-labor-intensive exports and develop exportables such as machinery and equipment that are intensive in skilled labor. Its literate and trainable working force is Taiwan's most important resource, and products intensive in skilled labor have bet-

ter world market prospects than products that are unskilled-labor intensive. The real effective exchange rate needs to be maintained at a level that will provide adequate incentives to exports. Export incentives could be increased by extending the scope of export credits, especially medium- and long-term credits, to foreign buyers of machinery and equipment, by reforming the export insurance and guarantee systems, and by initiating additional export promotion programs.

The Structure of Nominal Protection in Taiwan

Calculating Adjusted Tariff Rates

Apart from raising revenue,[19] the aim of imposing tariffs is to increase the domestic production of the protected commodities. In the case of Taiwan, the adjusted tariff rates, that is, the import duties actually paid, exceeded the legal tariff rates for two main reasons:[20] The tariff was levied on the dutiable value of imports, which amounted to 1.2 times the c.i.f. value, and harbor dues were levied on dutiable values at a rate of 4 percent. This meant, for instance, that the total tariff rate on a commodity with a legal tariff rate of 40 percent was 52.8 percent.

As noted earlier, many manufactures were protected not only by tariffs but also by quantitative restrictions. Article 4 of the "Criteria Governing the Control of Imports," promulgated by the Foreign Exchange and Trade Commission on July 27, 1960, and amended on January 8, 1968, states:

> The Foreign Exchange and Trade Commission of the Executive Yuan, for the purpose of economizing the nation's foreign exchange spending, may reclassify any commodity, or its acceptable substitute, which is produced domestically in sufficient quantity to meet the domestic demand, from permissible import into controlled import.
>
> If the commodity which has been reclassified as controlled import is an industrial product, it should conform to the following provisions:
>
> (1) The quality of the domestic product is up to international standard or [Taiwan's] standard as ascertained by Inspection. (In case the pertinent [domestic] standard has not yet been established, other national standards may be designated for temporary application.)
>
> (2) The ex-factory price of the domestic product (the cash-against-delivery price before payment of commodity tax as shown in the price list of various manufactures—if there are differences in the prices of a certain product provided by different manufactures, the highest price shall apply) is not 10 percent higher than the cost for import of similar products. Calculation of the cost of import shall include (a) c.i.f. cost, (b) import duty, (c) defense surtax, and (d) harbor dues. However, products of important domestic industries or newly established enterprises need not be subject to the limitation of 10 percent for a certain period, provided that it is permitted by the government authorities in particular, and the markup is less than 15 percent.
>
> (3) The cost of imported raw materials required for the manufacture of the product does not exceed 70 percent of the total production cost.

Thus, in 1969 the domestic price could exceed the tariff-inclusive c.i.f. import price by at most 10 percent in the case of industrial products that conformed to the above provisions and that were classified as controlled imports. With a markup of 10 percent, the adjusted tariff rate for a controlled commodity with a legal tariff rate of 40 percent was 68.1 percent.

Averaging Tariff Rates

Since the tariff schedule classifies import commodities in much more detail than does the presentation of industry data, we had to combine several tariff items to obtain an average rate for each sector in the input-output table for 1969. The procedures used in averaging adjusted tariff rates were as follows.

We determined the correspondence between Standard International Trade Classification groupings and each sector of the input-output table on the basis of information provided by the Council for International Economic Cooperation and Development and the Foreign Exchange and Trade Commission; our classification was carried up to seven digits.[21] We then located the corresponding tariff rate for each SITC item.[22] The columns of the input-output table were much more detailed than the rows since data were available for 241 producer sectors but only 76 user sectors. We first computed the arithmetic average of adjusted tariff rates for each of the 241 sectors. The sectors were then regrouped into 153 four-digit commodity groups and, subsequently, into 76 industries by averaging adjusted tariff rates; production values in world market prices were used as weights.

The Price Comparison Survey

In the case of controlled commodities, the domestic price may exceed the sum of the c.i.f. import price and the adjusted tariff. Alternatively, competition may reduce the domestic price below this limit and give rise to tariff redundancy. To take account of these possibilities,

direct price comparisons were made for 1969. The price comparison survey used data from various sources, primarily questionnaires and personal interviews, supplemented by government publications and the reports of manufacturers' associations. Price comparisons were made for 587 commodities in 141 commodity groups. It was not possible to obtain prices for 12 commodity groups; these will be considered subsequently. For 56 of the 141 commodity groups, only single price comparisons were made. In these commodity groups—which consist of agricultural products, foods, and in a few cases petrochemicals (for example, fuel oil and synthetic plastic resins)—products are generally homogeneous, and hence the implicit rate of protection derived for a single commodity may be taken for the group as a whole.

Manufactured tobacco (1800) and alcoholic beverages (1900) produced by the Tobacco and Wine Monopoly Bureau of Taiwan provide a special case. We computed the average implicit rate of protection by comparing the exfactory and the export prices of various brands from data provided by the Accounting and Statistics Office, Tobacco and Wine Monopoly Bureau of Taiwan.[23]

There were 85 commodity groups for which more than one price comparison was made. Six to ten price comparisons were made for 18 of these commodity groups and two to five price comparisons for 54 commodity groups. In the remaining 13 commodity groups, which contained many differentiated products, we made price comparisons for more than ten products.

Determining Nominal Rates of Protection

The results of the price comparisons were expressed as the percentage differences between domestic prices and c.i.f. import or f.o.b. export prices (that is, the implicit rates of protection) for individual commodities, and averages for four-digit commodity groups were calculated. Next, the nominal rate of protection for each commodity group was determined from data on the implicit rate of protection and the adjusted tariff rate.[24]

We classified commodities into the four trade categories used throughout this volume: export commodities, import-competing commodities, export-and-import-competing commodities, and non-import-competing commodities. The first category comprises goods of which more than 10 percent of domestic production is exported, while imports account for less than 10 percent of domestic consumption. Import-competing commodities are those of which less than 10 percent of production is exported, while more than 10 percent of domestic supply is imported. The third category comprises commodities of which more than one tenth of output is exported, and more than one tenth of domestic consumption is imported. In the case of non-import-competing commodities, international trade accounts for less than 10 percent of both output and consumption.

The following two criteria were applied to export commodities: First, if the export price were greater than or equal to the domestic price, the nominal rate of protection was taken to be zero. The underlying assumption is that the export commodity did not enjoy the benefits of protection, and hence that protection was redundant and the excess of export over domestic prices was due to quality differences. Second, if the export price were less than the domestic price, the nominal rate of protection on domestic sales was taken to be equal to the implicit rate of protection. In such instances, producers may have practiced price discrimination and exported at marginal costs.

For commodities competing with imports that were unrestricted by quotas, the nominal rate of protection was taken to be equal to the adjusted tariff rate on the assumption that competition equates domestic prices to the adjusted tariff-inclusive prices of imports for uncontrolled commodities. The same procedure was used for goods whose imports were controlled, if the implicit rate of protection was lower than the adjusted tariff-inclusive import price; the assumption here is that the price discrepancies were due to quality differences.

Many commodities fall into the export-and-import-competing category in Taiwan, an indication of intra-industry specialization. For most of these commodities, the nominal rate of protection was equated to the implicit tariff rate. In exceptional cases discussed later, the nominal rate was equated to the adjusted tariff. The same procedure was used for non-import-competing commodities.

For both of these categories, as well as for import-competing commodities, the nominal rate of protection was taken to be zero whenever the domestic price was less than the world market price, on the assumption that the discrepancy was due to quality differences.

The results of the price comparison survey by trade category are summarized in Table 10.5. Among the 587 commodities for which price comparisons were made, the world market prices exceeded the domestic prices of 230 items. Among the commodities whose domestic prices exceeded world market prices, 264 had implicit rates of protection below the adjusted tariff rates. This is to say, among commodities for which we made price comparisons, 39 percent did not exploit the benefits from tariff and nontariff protection and 45 percent did not exploit these benefits fully.

For the majority of products, then, the adjusted tariff rates tended to exaggerate the differences between domestic prices and world market prices. For 90 percent of the export and non-import-competing commodities,

Table 10.5. *Taiwan: Frequency Distribution of the Results of Price Comparisons, by Trade Category, 1969*
(number of commodities)

	X	XIC	IC	NIC	Total	Primary	Manufactured
World Price Higher than Domestic Price	81	82	32	35	230	34	196
Domestic Price Higher than World Price							
Adjusted Tariff Rate Higher than Implicit Protection Rate	66	104	61	33	264	2	262
Implicit Protection Rate Higher than Adjusted Tariff Rate	16	47	24	6	93	8	85
Total	163	233	117	74	587	44	543

Note: World price = c.i.f. import or f.o.b. export price; domestic price = exfactory price.

tariffs were redundant; the proportion was about 80 percent for the import-competing and the export-and-import-competing categories. In the last two groups, tariffs had apparently been made redundant by increases in productivity.[25]

Special considerations apply to exported products, which included most of the cases where world market prices exceeded domestic prices. For primary commodities, higher export prices are often due to differences in quality. Taiwan's exports of bananas, for instance, are subject to government inspection, and those judged unfit for export are sold domestically at a lower price.

Canned food (1700, 1710, 1720) presents a somewhat different case. For pineapples, mushrooms, and asparagus, contract prices for export were determined by collective bargaining between growers and processors, subject to government approval. As an illustration, no canner was allowed to buy mushrooms from noncontract growers or at prices lower than the contract price. The right to export canned mushrooms was suspended if the contract was violated. Such practices tended further to augment the prices of exports.

Quality differences may also explain why export prices exceeded domestic prices for certain manufactured goods, such as leather shoes (3611), reclaimed rubber (3709), citronella oil (4200), anhydrous ammonia (4312), cement (4500), pig iron (4901), and ferro-silicon (4902). Unlike primary commodities, however, the domestic prices of most manufactured goods exceeded the world market price.

Table 10.6 shows the frequency distribution of the estimated rates of nominal protection by four-digit industries. The table also indicates the special cases where we have not followed the prescribed criteria. Among the commodity groups for which price comparison data were available, the nominal rate of protection of domestic sales was taken to equal the adjusted tariff rate for two out of thirty-six export industries—television sets (5602) and bicycles (6003). The implicit rates of these industries exceeded the adjusted tariff rates by wide margins, apparently because of quality differences in favor of domestically sold products. For similar reasons we have chosen the adjusted tariff rates to represent the nominal rates of protection in four industries in the

Table 10.6. *Taiwan: Frequency Distribution of Nominal Protection Rates on Four-digit Industries, by Trade Category, 1969*

	Trade Category				
	X	XIC	IC	NIC	Total
With Price Comparison Data					
World Price Higher than Domestic Price					
Nominal Protection Rate = 0	15	7	2 f/	21	45
Nominal Protection Rate = Adjusted Tariff Rate	-	-	2	-	-
Domestic Price Higher than World Price					
Nominal Protection Rate = Implicit Protection Rate	19	25	3 g/	17	64
Nominal Protection Rate = Adjusted Tariff Rate	2 a/	4 c/	23	-	29
Nominal Protection Rate = 0	-	1 d/	-	-	1
Subtotal	36	37	30	38	141
Without Price Comparison Data					
Nominal Protection Rate determined by:					
Implicit Protection Rates for Comparable Products	1 b/	4 e/	1 h/	5 k/	11
Tariff Actually Paid	-	-	1 i/	-	1
Subtotal	1	4	2	5	12

Note: World price = c.i.f. import or f.o.b. export price; domestic price = exfactory price.

a/ television sets, bicycles
b/ lumber
c/ tableware, machinery parts, transistor radios, scientific and medical instruments and apparatus
d/ minerals for chemicals and fertilizers
e/ metallic minerals, "other" leather products, "other" fuel oils, gasoline and diesel oils, asphalt
f/ salt and byproducts, industrial alcohol
g/ tobacco manufactures, paper and paper products, and leather
h/ Chinese medicines
i/ crude petroleum
k/ sweet potatoes, sugarcane, natural gas, printing and publishing, cement products

export-and-import-competing category: tableware (5010), machinery parts (5430), transistor radios (5603), and scientific and medical instruments and apparatus (6100).

Minerals for chemicals and fertilizers (1530), an export-and-import-competing industry, is another special case. Locally produced raw sulphur, the only product in this category for which price comparisons could be made, provided a small fraction of domestic consumption at a considerably higher price than the import price. Minerals make up the bulk of this commodity group, for which we assumed that the nominal rate of protection

equaled that for nonmetallic minerals such as clay (1500), sand (1510), and stone (1520).

Among import-competing industries, salt and by-products (1400) have been imported to make up for insufficient domestic supply. Since the import price was higher than the domestic price, the tariff protection appeared to be redundant, and we therefore assumed that the nominal rate of protection of salt was zero. The same procedure was followed for industrial alcohol (4311).

Adjusted tariff rates exceeded the implicit rates by a substantial margin for tobacco manufactures (1800), paper and paper products (3410), and leather (3600). Products in all these industries are heterogeneous, and tariff and nontariff protection appear to have been redundant. We have, therefore, equated nominal rates of protection to the implicit rates rather than to the adjusted tariff rates.

For twelve four-digit industries, price comparisons could not be made. For five of them (one export industry and four export-and-import-competing industries), we derived the nominal rates of protection by applying the implicit rates of similar commodities. The nominal rate of protection of lumber (3100), an export industry, was assumed to be equal to the implicit rate for forestry (08); the nominal rate for metallic minerals (1100) was assumed to be equal to that of nonmetallic minerals (15); and the nominal rates of gasoline and diesel oil (4100) and asphalt (4130) was assumed to be the same as that of other fuel oils (4100). Finally, the nominal rate of other leather products (3619) was derived by applying the implicit rate for leather shoes (3611).

Chinese medicines (3900) competed with imports, and according to our criteria their nominal rate of protection was equated to the adjusted tariff rate. Sweet potatoes (0202), natural gas (1300), printing and publishing (3500), and cement products (4600) were non-import-competing industries for which we assumed a zero nominal rate of protection.

Sugarcane (0300) accounted for 72.4 percent of the material costs of refined sugar (1600). The price of sugarcane was guaranteed by the Taiwan Sugar Corporation, the government sugar-refining monopoly. The guaranteed floor price was announced before the planting season; if international sugar prices rose, growers received higher prices. We therefore assumed that sugarcane growers received the same degree of nominal protection as sugar refiners.

Finally, crude petroleum (1200) was an import-competing industry, for which rates differed depending on the petroleum content. Unless the product composition of imported crude petroleum is known, an average adjusted tariff rate may give a seriously biased estimate of protection. We assumed that the product composition of imported crude petroleum remained stable, and thus estimated the nominal rate of protection from the data on tariffs actually paid.

Effective Protection and Subsidies

Most of the information needed to calculate effective protection rates in 1969 is available in tables compiled by the Council for International Economic Cooperation and Development, Executive Yuan. They contain data on interindustry transactions at purchasers' prices, interindustry transactions at producers' prices, interindustry domestic transactions, and interindustry import transactions. Effective protection rates were calculated for 61 two-digit sectors of which 9 were in agriculture, forestry, and fishing, 6 in mining, and 46 in manufacturing. The input-output tables also include 15 sectors producing household goods. The results are shown in Appendix Table 10.1.

Estimating Effective Protection Rates

In our calculation of incentive measures, value added has been defined to be net of depreciation and indirect taxes. Nontradeable inputs were divided into direct and indirect tradeable inputs and direct and indirect value added. Both the Balassa and the Corden methods were used; direct and indirect value added is included with tradeable inputs in the first method and with value added in processing in the second; direct and indirect tradeable inputs are combined with tradeable inputs under both methods.

A distinction was made between production for domestic use and for export. Input coefficients for domestic use and for exports were derived by assuming that the physical input coefficients are identical in the two cases. The nominal protection of the output and inputs used in production for domestic and for export markets—and hence the input coefficients expressed in value terms—will differ.

The effective protection of production for domestic use depends on the nominal protection of the output and inputs. The nominal protection of the output and inputs in production for exports was taken to be zero, since exports were sold at world market prices and exporters could import inputs duty free. However, tariffs on inputs into nontraded goods and on four major components of fixed capital—machinery, electrical equipment, vehicles, and tradeable inputs for construction—raised the costs that producers had to pay for inputs for export production above world market prices. As a result, the effective protection of exports was negative.

Estimating Effective Subsidy Rates

Apart from the tariffs on inputs used in the production of nontraded inputs and on fixed capital, exports received free-trade treatment in Taiwan. Various export incentives were also provided. First, exporters received low-interest loans to finance imports of raw materials. The monthly interest rate was 0.5625 percent, compared with the 1.17 percent charged for unsecured loans. This difference in interest charges has been treated as an export subsidy. Second, 2 percent of the annual total export earnings of exporters could be deducted from their taxable incomes. The export subsidy provided by this incentive measure has been estimated by multiplying 2 percent of export earnings by 0.25, which was the prevailing tax rate on business income. Third, facilities were made available for the rapid collection of export proceeds. Assuming that the difference in collection time between export and domestic transactions was three months, we estimated the benefit from these facilities by multiplying export earnings by the interest rate for a three-month unsecured loan. Fourth, some of the manufacturers' associations administered direct subsidies for exports. In the case of cotton spinning and iron and steel, a certain percentage of the value of raw materials imported (20 percent of c.i.f. import value for cotton, 7.5 percent of c.i.f. import value for scrap iron and steel, and US$2.5 per ton for scrapped ship) was placed in a cooperative fund to be used to subsidize members that exported products using these imports as inputs. This type of export subsidy amounted to 5 percent of f.o.b. export value for cotton spinning and rubber products, and 7.5 percent for steel and iron. Export promotion schemes were also applied in the case of monosodium glutamate, woolen yarn and fabrics, and paper and paper products.

These subsidies were included in our calculation of effective rates of subsidy for exports. Production for domestic markets received no credit or tax subsidies. As in the other case studies, effective subsidy rates have been subsequently adjusted, so that their weighted average equals that for effective protection rates.

Bias against Exports

While effective protection and subsidy rates measure the extent of incentives to particular sectors, the extent of the bias against exports indicates to what degree the incentive system favors producing for the domestic market. The extent of the anti-export bias was calculated as the percentage by which domestic value added realized by production for domestic use exceeded that obtainable from exporting. Abstracting from differences between c.i.f. and f.o.b. values, this difference will, in turn, equal the ratio of effective protection or subsidy for domestic use to that of exports.

The next two sections examine the results for the major industry groups and trade categories. Nominal rates of protection, effective rates of protection and subsidy, bias against exports, and the cash flow measure for the ten major industry groups and for the four trade categories are shown in Tables 10.7 and 10.8, respectively.

Nominal and Effective Protection by Industrial Group

The nominal rates of protection pertaining to individual industries were averaged by using the world market value of output as weights. World market value added was also used in averaging effective rates of protection and subsidy; this weighting scheme ensures that the average effective rate thus calculated equals the effective rate calculated directly from data on domestic and world market value added for the industry group as a whole. Data on output and value added in domestic and world market prices are available from the authors.

As already noted, tariff and nontariff protective measures were to a considerable extent redundant. The weighted averages of adjusted tariff rates and nominal rates of protection on production for domestic markets were 61 and 12 percent, respectively (Tables 10.7 and 10.8). Since exports did not enjoy any protection, the weighted average nominal rate of protection on production both for domestic use and for export was even lower (9 percent).

Tariff redundancy was particularly marked in primary activities (categories I and IV in Table 10.7). While the average adjusted tariff rate for primary products sold domestically was 53 percent, the average nominal rate of protection on domestic sales of these products was only 2 percent. Also, negative effective protection and effective subsidy rates indicate that primary production for domestic markets was taxed rather than protected or subsidized by the government measures. Estimates of effective protection of the primary sector reveal that exports were favored over production for domestic markets. Exports of primary activities also enjoyed various subsidies, so that effective rates of subsidy on these exports were positive.

The adjusted tariff rate and the nominal rate of protection were highest on beverages and tobacco. Alcoholic beverages and tobacco were manufactured under a government monopoly that also regulated imports. For this industry, value added as defined under the Balassa method was negative in world market prices. As expected, there was also a bias against exports.

Average adjusted tariff rates and nominal rates of

Table 10.7. *Taiwan: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1969*
(percent)

	Export Share	Import Share	Adjusted Tariff Rate	Nominal Rate of Protection		Effective Protection				Export Subsidy[a]	Effective Subsidy				Bias against Exports[b]
						Balassa			Corden		Balassa			Corden	
			D	D	A	E	D	A	A		E	D	A	A	
Agriculture, Forestry, & Fishing	10.1	16.9	54	2	2	-2	-5	-4	-4	4	2	-8	-7	-6	-10
Mining and Energy (IV)	4.0	42.0	37	0	0	-3	-7	-7	-6	4	2	-10	-10	-8	-12
Primary Activities (I+IV)	9.6	19.9	53	2	2	-2	-5	-5	-4	4	2	-9	-7	-6	-11
Processed Foods (II)	35.3	7.5	79	12	8	-7	5	1	6	5	30	1	7	10	-23
Beverages and Tobacco (III)	8.4	15.2	167	53	48	-379	-6,036	-6471	216	4	747	-5812	-6316	210	-775
Construction Materials (V)	13.6	4.2	36	0	0	-3	-11	-10	-8	4	5	-15	-12	-9	-19
Intermediate Products I (VIA)	21.0	32.3	50	19	14	-7	41	30	20	5	29	36	34	16	-6
Intermediate Products II (VIB)	42.4	28.3	78	21	12	-5	30	16	8	5	30	26	27	13	1
Nondurable Consumer Goods (VII)	30.9	20.8	74	15	10	-2	13	8	6	4	10	9	9	6	-2
Consumer Durables (VIII)	55.0	51.7	52	32	14	-3	50	29	14	4	30	44	38	19	12
Machinery (IX)	21.8	58.5	35	11	9	-1	1	1	0	4	11	-3	0	0	-12
Transport Equipment (X)	13.7	58.6	59	31	27	-4	72	55	28	4	10	66	53	26	51
Manufacturing, less Beverages and Tobacco (II, V-X)	32.1	32.8	64	18	12	-4	23	15	9	5	23	18	20	11	-4
Manufacturing, less Beverages and Tobacco and Construction Materials (II, VIA-X)	33.9	32.9	65	19	13	-4	28	18	11	5	24	24	24	13	0
Manufacturing, less Beverages and Tobacco, Construction Materials, and Processed Foods (VIA-X)	37.5	32.3	63	20	14	-4	31	21	11	5	23	27	25	13	3
Manufacturing (II, III, V-X)	31.6	32.7	66	18	13	-4	28	19	11	5	23	24	23	13	1
All Industries, less Beverages and Tobacco (I, II, IV-X)	24.6	28.2	59	11	9	-4	5	3	3	4	16	1	3	3	-13
All Industries (I-X)	24.3	28.0	61	12	9	-4	6	5	4	4	16	2	5	4	-12

a/ Expressed as a percentage of the c.i.f. value of exports.
b/ Derived using the Balassa measures.

Table 10.8. *Taiwan: Nominal Protection, Effective Protection, Export Subsidy, and Effective Subsidy Rates, by Trade Category, 1969*
(percent)

	Adjusted Tariff Rate	Nominal Rate of Protection		Effective Protection				Export Subsidy [a]	Effective Subsidy				Bias against Exports [b]
				Balassa			Corden		Balassa			Corden	
	D	D	A	E	D	A	A		E	D	A	A	
Export Industries	86	10	6	-4	3	1	1	5	11	-1	3	3	-11
Primary Activities	97	0	0	-2	-12	-9	-8	4	2	-15	-9	-8	-17
Manufacturing	80	15	9	-5	24	14	8	5	23	19	20	11	-3
Export-Import-Competing Industries	59	20	13	-4	28	18	11	4	22	23	23	13	1
Primary Activities	38	0	0	-1	-4	-3	-3	4	1	-7	-6	-5	-8
Manufacturing	60	21	13	-4	36	23	12	4	24	31	29	15	6
Import-Competing Industries	66	11	11	-2	9	9	7	4	10	5	5	4	-5
Primary Activities	62	3	3	-1	-1	-1	-1	4	4	-5	-5	-4	-8
Manufacturing	74	27	25	-5	155	133	35	4	22	145	128	32	101
Non-Import-Competing Industries	47	5	5	-1	-5	-5	-3	4	8	-9	-8	-5	-16
Primary Activities	36	2	2	-1	-5	-5	-4	4	5	-8	-8	-7	-13
Manufacturing	67	10	9	-2	-7	-7	2	4	10	-11	-9	0	-19
All Industries	61	12	9	-4	6	5	4	4	16	2	5	4	-12
Primary Activities	53	2	2	-2	-5	-5	-4	4	2	-9	-7	-6	-11
Manufacturing	66	18	13	-4	28	19	11	5	23	24	23	13	1

a/ Expressed as a percentage of the c.i.f. value of exports.
b/ Derived using the Balassa measure.

protection on processed foods for domestic use were estimated to be 79 percent and 12 percent, respectively (Table 10.7). Average effective rates of protection and subsidy were relatively low for these products compared with those on other manufactures, and the effective subsidy measures show a bias in favor of exports. Different parts of the processed foods industry received contrasting treatment, however, as can be seen from Appendix Table 10.1. First, the nominal rates of protection on canned food (17) and miscellaneous foods (25) were zero, and the domestic use of these products was taxed since protection raised the cost of some of their inputs, such as tin sheet. Second, most other processed foods had positive nominal rates of protection and high effective rates of protection and subsidy. Both the adjusted tariff rate and the nominal rate of protection on monosodium glutamate (20) sold in domestic markets exceeded 130 percent, and this industry also enjoyed considerable export subsidies. In turn, with a low ratio of domestic value added to output and high nominal protection, value added in production for domestic markets was negative in world market prices for edible vegetable oil (22) and wheat flour (21) under the Balassa method, and also negative for vegetable oil under the Corden method. Effective rates of protection were relatively high on sugar (16) and on tea (24).

The nominal rate of protection on construction materials (V) was nil, and effective rates of protection and subsidy on domestic sales were negative. This industry received small export subsidies; exports were favored over domestic sales. Cement exports further benefited from the existence of abundant deposits of raw materials and clay, modern production facilities, low labor costs, and relatively cheap power.

Intermediate products are divided into two subgroups: Intermediate products I are used as inputs for higher-level intermediate products II. Adjusted tariff rates generally escalate with the degree of processing. This conclusion applies, for example, to cotton yarn, wool tops, wood pulp, and plastic powder classified as intermediate products I, and to cotton fabrics, woolen textiles, fabrics and other manufactures, paper and paper products, and plastic products classified as intermediate products II. Average nominal rates of protection were almost the same for the two categories of intermediate products, however, and effective rates of protection and subsidy were higher on intermediate products I than on intermediate products II (Table 10.7).

Note further that the incentive structure for intermediate products I, which had higher effective rates of protection and subsidy, was biased against exports, whereas that for intermediate products II, which had lower effective rates of protection and subsidies, was biased in favor of exports. The incentives provided may have contributed to the high export share (42 percent) of intermediate products II; the corresponding share for intermediate products I was 21 percent (Table 10.7).

Nondurable consumer goods are generally considered to be the prime candidates for the initial phase of import substitution. The idea that the availability of domestic products justifies a high rate of protection appears to be reflected in the very high adjusted tariff rates on nondurable consumer goods. Tariff and nontariff protection were redundant to a large extent, however, and nominal rates of protection were considerably lower than adjusted tariff rates. Also, effective rates of protection and subsidy were lower on nondurable consumer goods than the average for the manufacturing sector as a whole. Although there was a slight bias against exports, exports of these products increased rapidly. As shown in Table 10.7, the export share of nondurable consumer goods was 40 percent in 1969.

Apart from beverages and tobacco, consumer durables had the highest nominal rates of protection within the manufacturing sector, but the relatively high protection of its inputs reduced the effective rates of protection and subsidy of this industry group. Notwithstanding a small bias in favor of production for domestic use and against exports, the higher than average effective rate of subsidy to export production contributed to the large export share (55 percent) of this group.

Machinery industries produced for export and competed with imports in the domestic market. The effective protection of sales in the domestic markets was negligible in this industry, and there was a bias in favor of export sales. Although machinery exports were of relatively recent origin, they reached 22 percent of the value of output in 1969. Although quality would still need to be improved, machinery offers excellent possibilities for export expansion since it is intensive in skilled labor.

Parts and components for transport equipment could be imported at lower tariff rates than final goods, and there was a relatively low ratio of value added to gross output in this industry group. Correspondingly, effective rates of protection and subsidy were substantially higher than nominal rates, and there was also a bias against exports. The distorted domestic price structure encouraged the domestic production of motor vehicles, which consisted of assembling imported components on inefficient small-scale assembly lines. Except in shipbuilding, exports remained small, accounting for only 14 percent of output of transport equipment in 1969.

Nominal and Effective Protection by Trade Category

Table 10.8 shows the structure of protection by trade category. Export industries generally had higher adjusted tariff rates, but lower nominal rates of protection,

than the other three trade categories. It appears that tariff protection became largely redundant as productivity improved in a process of successful export expansion. Two possible reasons for the relatively high adjusted tariff rate on export industries are that the tariff structure of export industries had not yet been revised to make it conform with realized protection, or that the government wished to discourage imports of finished goods, such as processed foods and nondurable consumer goods, which were exported by Taiwan.

Like nominal rates of protection, effective rates of protection and subsidy were lower for export industries than for XIC industries or import-competing industries. In particular, domestic sales of primary export products were taxed rather than protected. But there were export subsidies on primary as well as on manufactured exports.

While import-competing industries had a higher adjusted tariff rate than export-and-import-competing industries, their average nominal and effective rates of protection and effective rates of subsidy were considerably lower. This implies that the tariff and nontariff protection accorded them was substantially redundant. This finding appears contradictory to the criterion used to determine the nominal rate of protection on import-competing industries—that is, that the nominal rate of protection is equal to the adjusted tariff rate—and it may be explained by aggregation. Thus, the criteria stipulated earlier were applied to the four-digit industry classification, while estimates of effective protection and subsidy pertain to two-digit industry categories, which may include four-digit commodity groups that belong to several trade categories.

Nevertheless, import-competing manufacturing was highly protected, and there was also a bias against exports. In contrast, import-competing primary activities had low nominal protection and were in fact taxed by the high tariffs on their inputs, so that in this case the bias of incentives was in favor of exports.

Export-and-import-competing industries occupied an intermediate position between export industries and import-competing industries. Apart from primary activities, which show little difference, average nominal and effective rates of protection and effective rates of subsidy for XIC industries were higher than for export industries and lower than for import-competing industries. These results, and the relatively low degree of tariff redundancy, reflect the fact that the XIC industries were in a transitional phase and had not yet become fully competitive internationally.

Industries in the export-and-import-competing category exported a large proportion of their output: 39.5 percent in comparison with 38.5 percent for export industries. The coexistence of exports and imports in these industries reflects in part the extent of intra-industry specialization and in part the importance of processed exports and assembly operations that are based on imported inputs, which often belong to the same two-digit category. For instance, the categories of machinery, metal products, and electrical apparatus and equipment cover diverse types and qualities of products, some of which may be exported and some imported. Also, foreign companies in Taiwan often combined imported intermediate inputs with domestic labor. A case in point is that of transistor radios (5603): Exports accounted for 98 percent of production, and imports (mostly of intermediate inputs) made up 92 percent of domestic consumption. The government's attempts to encourage the domestic production of inputs may partly explain the fact that the protection of export-and-import-competing manufacturing was higher than that of export industries.

Nominal rates of protection were lowest in non-import-competing industries. The very high degree of tariff redundancy is related to the fact that tariffs in these industries had not yet been revised to conform with realized protection. With low nominal protection of the output and relatively high protection of inputs, effective rates on protection and subsidy on production for domestic markets were negative in these industries, and there was a bias in favor of exports.

For all industries together, the weighted average effective rates of protection according to the Balassa and the Corden measures were 5 percent and 4 percent, respectively (Table 10.7). These figures are quite low by international standards.[16] Taking export subsidies into account, the weighted average effective rate of subsidy on exports measured by the Balassa method was 16 percent and for manufactured exports it was 23 percent; domestic sales of manufactures received average effective subsidies of 24 percent.

On the whole, export subsidies do not appear to have been excessive. There were, however, some exceptions. Exports of cotton fabrics (28) and woolen and worsted fabrics (29) received effective rates of subsidy of 88 percent and 91 percent, respectively, and incentives strongly favored exports over domestic sales. Monosodium glutamate (20) received a higher effective export subsidy, at 213 percent, than any other industry; effective protection on the domestic sale of this product was even higher.

Under the Balassa method, value added in world market prices was negative in tobacco (18), alcoholic beverages (19), wheat flour (21), edible vegetable oil (22), artificial fibers (26), and inedible vegetable and animal oils (42). Of these industries, alcoholic beverages, wheat flour, and edible vegetable oil belonged to the non-import-competing and the other industries to the import-competing category. The infant industry argument

Table 10.9. *Taiwan: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Industry Group, 1969*
(percent)

	Net Adjusted Tariff Rate	Net Nominal Rate of Protection		Net Effective Rate of Protection				Net Effective Subsidy			
				Balassa			Corden	Balassa			Corden
	D	D	A	E	D	A	A	E	D	A	A
Agriculture, Forestry, & Fishing (I)	47	-3	-3	-8	-10	-9	-8	-3	-13	-12	-10
Mining and Energy (IV)	30	-4	-4	-8	-11	-11	-10	-3	-15	-14	-13
Primary Activities (I+IV)	45	-3	-3	-7	-10	-10	-9	-3	-13	-12	-10
Processed Foods (II)	71	7	3	17	-5	-10	1	-15	-9	0	5
Beverages and Tobacco (III)	155	45	41	-204	23,690	13,348	201	218	22,794	13,019	195
Construction Materials (V)	29	-5	-5	-9	-16	-15	-12	-1	-20	-17	-14
Intermediate Products I (VIA)	43	13	9	-15	28	18	9	17	23	22	11
Intermediate Products II (VIB)	70	15	7	-13	19	6	3	19	14	16	8
Nondurable Consumer Goods (VII)	66	10	5	-8	5	1	1	2	1	2	1
Consumer Durables (VIII)	45	26	9	-13	38	18	9	16	33	26	13
Machinery (IX)	29	6	4	-7	-7	-7	-4	3	-10	-7	-5
Transport Equipment (X)	51	25	21	-11	-56	41	22	3	50	40	20
Manufacturing, less Beverages and Tobacco (II, V-X)	56	12	7	-13	13	6	4	12	9	10	6
Manufacturing, less Beverages and Tobacco and Construction Materials (II, VIA-X)	58	13	7	-13	18	8	5	13	13	13	8
Manufacturing, less Beverages and Tobacco, Construction Materials, and Processed Foods (VIA-X)	55	14	8	-12	21	11	-2	12	16	15	8
Manufacturing (II, III, V-X)	59	13	7	-13	18	9	6	12	13	13	8
All Industries, less Beverages and Tobacco (I, II, IV-X)	52	6	3	-11	-2	-4	-2	7	-6	-4	-2
All Industries (I-X)	53	7	4	-11	0	-2	-1	7	-4	-2	-1

may help to explain the high protection of artificial fibers, but not that of the other industries. The estimate may be a statistical anomaly as a result of using inappropriate deflators; inputs may have been underdeflated and outputs overdeflated.

Domestic sales received negative effective protection in several industries. As measured by the Balassa method, these were rice (01), other common crops (02), crops for processing (04), miscellaneous horticultural crops (02), hogs (06), forestry (08), fisheries (09), coal and coal products (10), natural gas (13), salt (14), nonmetallic minerals (15), miscellaneous foods (25), woolen and worsted fabrics (29), lumber (31), pulp, paper, and paper products (34), printing and publishing (35), leather and products (36), cement (45), cement products (46), miscellaneous nonmetallic mineral products (48), steel and iron (49), and aluminum products (52). Rather than being protected, these activities were taxed as a result of tariffs on their inputs. The tariff and nontariff protection of these industries would need to be reviewed to increase the economic rationality of protection. In particular, it would be necessary to ensure proper price relations between agriculture and the rest of the economy.[27]

Net Effective Protection and Subsidies

The imposition of protective measures makes it possible to maintain external balance at a lower exchange rate (fewer units of domestic currency per U.S. dollar) than the exchange rate under free trade. Effective rates of protection and subsidy calculated at the exchange rate observed under protection will thus overstate the extent of (net) protection of individual industries.

The effective rates of protection and subsidy for 1969 shown in Tables 10.7 and 10.8 have been measured at the existing exchange rate. To adjust them for the overvaluation of the exchange rate, compared with the hypothetical free-trade situation, requires information on export value, import value, the nominal rates of protection and export subsidy, the elasticity of import demand, and the elasticity of demand for and supply of exports.

The extent of overvaluation under alternative assumptions ranges between 6.7 and 9.3 percent. The central value of 4.9 percent has been derived on the assumption that the elasticity of export demand, the elasticity of export supply, and the elasticity of import demand were 8, 5, and 2, respectively. Estimates of net effective protection and subsidy, adjusted for the overvaluation of 4.9 percent, are shown in Tables 10.9 and 10.10. After the adjustment, the average net effective rates of protection and subsidy for all industries were zero under the Balassa measure and −1 percent under the Corden measure.

Rank Correlation among Various Indicators of Incentives

Spearman rank correlation coefficients calculated among various indicators of incentives indicate that adjusted tariff rates do not provide an appropriate basis for judging incentives. Rank correlation coefficients between adjusted tariff rates and other indicators of incentives are less than 0.25 and are not significant at the 5 percent level. Rank correlation coefficients are 0.44 between nominal and effective protection rates, 0.65 between effective protection and effective subsidy rates, and 0.91 between nominal protection and effective subsidy rates. Balassa and Corden effective rates have a rank coefficient of 0.98. Other tests revealed no significant correlations between effective rates of protection and either the capital intensity or the skill intensity of industries.[28]

The frequency distribution of adjusted tariff rates and nominal and effective rates of protection are shown in Table 10.11. It is apparent that the dispersion of the rates increases to a considerable extent as we move from adjusted tariff rates to nominal protection rates, and then to effective rates.

Overview of the Incentive Structure

Since quantitative restrictions were applied in addition to tariffs and since many tariffs were redundant, it was necessary to make direct comparisons between domestic and import or export prices. Among 587 commodities for which price comparisons were made, 230 had world market prices exceeding domestic prices. Of the remainder, 264 had implicit rates of protection that fell below the adjusted tariff rates. This is to say that, among commodities for which we made price comparisons, 39 percent derived no benefits from tariff protection, and 45 percent did not fully exploit the potential benefits of tariff protection. These results indicate the existence of tariff redundancy in Taiwan.

Adjusted tariffs were highest and nominal rates of protection were lowest in export industries. The structure of protection appears to reflect the superior efficiency that export industries had achieved over time. Adjusted tariff rates do not, however, clearly indicate incentives in Taiwan. The pattern of legal tariffs in 1969 was the result of policy decisions taken at different times without an attempt at consistency. These considerations point to the desirability of revising and simplifying the tariff structure in accordance with a clear concept of its economic rationale.

The weighted average effective rates of protection on all industries, measured by the Balassa and the Corden methods, were 5 percent and 4 percent, respectively;

Table 10.10. *Taiwan: Net Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Trade Category, 1969*
(percent)

	Net Adjusted Tariff Rate	Net Nominal Rate of Protection		Net Effective Protection				Net Effective Subsidy			
				Balassa			Corden	Balassa			Corden
	D	D	A	E	D	A	A	E	D	A	A
Export Industries	77	5	1	-7	-2	-4	-4	2	-5	-2	-2
Primary Activities	88	-5	-5	-7	-15	-12	-12	-2	-17	-12	-12
Manufacturing	71	10	4	-7	9	3	3	5	6	6	6
Export-Import-Competing Industries	51	15	8	-7	11	5	5	6	8	7	7
Primary Activities	32	-5	-5	-6	-8	-8	-8	-3	-10	-9	-9
Manufacturing	53	16	8	-7	14	7	7	6	11	9	9
Import-Competing Industries	58	6	6	-6	2	2	2	1	-1	-1	-1
Primary Activities	54	-2	-2	-5	-6	-6	-6	-1	-8	-8	-8
Manufacturing	66	21	19	-7	32	29	29	3	28	26	26
Non-Import-Competing Industries	40	0	0	-5	-7	-7	-7	1	-10	-9	-9
Primary Activities	29	-3	-3	-5	-9	-9	-9	0	-11	-11	-11
Manufacturing	59	5	4	-6	-2	-3	-3	2	-5	-5	-5
All Industries	53	7	4	-7	0	-1	-1	4	-2	-1	-1
Primary Activities	45	-3	-3	-7	-9	-9	-9	-2	-11	-10	-10
Manufacturing	59	13	7	-7	12	6	6	6	9	8	8

Table 10.11. *Taiwan: Frequency Distribution of Selected Indicators of Incentives, 1969*

Value		Adjusted	Nominal Protection		Effective Protection		
					Balassa		Corden
From	To	Tariff Rate	Domestic	Average	Domestic	Average	Average
-100.0	-50.1	0	0	0	7	5	1
-50.0	-40.1	0	0	0	3	0	0
-40.0	-30.1	0	0	0	1	2	0
-30.0	-20.1	0	0	0	1	3	2
-20.0	-10.1	0	0	0	9	7	7
-10.0	-0.1	0	0	0	13	16	19
0		0	18	18	0	0	0
0.1	10.0	2	11	15	1	6	6
10.1	20.0	3	7	9	4	1	8
20.1	30.0	3	9	9	2	3	4
30.1	40.0	4	6	6	1	3	3
40.1	50.0	7	5	1	2	1	1
50.1	100.0	30	4	3	6	6	4
100.1	200.0	12	1	0	5	5	3
200.1 & above		0	0	0	6	3	3

effective rates averaged 6 percent on domestic sales and −4 percent on export sales under the Balassa method. These figures are quite low by international standards. Taking export subsidies into account modifies the relative incentives provided to sales in domestic and in foreign markets. On the whole, the system of incentives favored exports over import substitution, although within manufacturing industries there was little discrimination. Finally, export subsidies did not appear excessive, except in the case of cotton fabrics and woolen and worsted fabrics, which had effective subsidy rates of 88 and 91 percent, respectively.

A few industries had negative value added at world market prices when measured by the Balassa method. Some of these cases—which included tobacco, alcoholic beverages, wheat flour, edible vegetable oil, artificial and inedible vegetable oils, and animal oils—might have been due to errors in the deflators used.

The measured rates of effective protection and effective subsidy show that primary products for domestic use were taxed as a result of the tariffs on their inputs. There was also a bias against primary exports, but it was much smaller than such biases in most other developing economies. Taiwan also differed from other developing economies in that rates of protection did not escalate within the manufacturing sector.

Of the 61 sectors in the 1969 input-output table, 27 were in the export-and-import-competing category, a fact reflecting the existence of intra-industry specialization in Taiwan. Effective rates of protection and subsidy

on the products of these industries were intermediate between those in import-competing industries, which had higher rates, and those in export industries, which had lower rates. Industries in the export-and-import-competing group appear to have been in a transitional phase and, unlike export industries, had not yet become fully competitive internationally.

Export Performance and Structural Change

A viable industrialization strategy must go beyond import substitution to gain access to foreign markets. This section reviews to what extent Taiwan's export-oriented strategy has been successful in transforming Taiwan's economy. It examines changes in the commodity composition and the geographical distribution of Taiwan's exports, the factors affecting changes in exports, and the effects of exports on economic growth.

Postwar Developments in Foreign Trade

Table 10.12 shows that, at current prices, the ratio of exports to GDP increased from 9 to 52 percent between 1952 and 1976, while the share of imports rose from 20 to 49 percent. Apart from indicating the increased trade orientation of Taiwan's economy, these figures show that earlier large import surpluses gave place to export surpluses in the early 1970s. Also, the trade deficits of 1974 and 1975 as a result of the oil crisis and the world recession were followed by an export surplus in 1976.

Between 1952 and 1976 the volume of exports grew at an average annual rate of 15.8 percent (Table 10.2), and the composition of exports varied greatly. As shown in Table 10.12, two staples, sugar and rice, accounted for almost 70 percent of Taiwan's total exports during the first half of the 1950s. The share of these commodities had fallen to less than 2 percent by 1976, and their place was taken by manufactured goods.

The leading manufactured exports have been clothing and footwear, electrical machinery and appliances (mainly telecommunications equipment), textiles, and plastic articles. Over the decade 1965–76 rapid growth was achieved in exports of nonelectrical machinery, transport equipment, and metal products. All in all, the share of manufactured exports (excluding food, beverages, and tobacco) rose from 5 percent in 1953 to 88 percent in 1976.

The decline of traditional agricultural exports was accompanied by the emergence of new export-oriented agricultural products, of which canned mushrooms and asparagus spears are the most notable examples. These exports started in the early 1960s and reached a value of US$158 million in 1976. The emergence of new export crops is largely explained by the provision of incentives and government aid, including overseas market information and technical assistance.

The increased diversification of Taiwan's exports is shown by the coefficients of commodity concentration, calculated at the SITC three-digit commodity level, which are presented in Table 10.13. Coefficients of commodity concentration for imports declined, although less so than did those of exports; they increased again in 1976, largely because of the increased share of oil imports after the rise in the price of oil.

Table 10.13 also presents coefficients of geographical concentration. Imports have been more geographically concentrated than exports since 1955. This difference reflects the fact that Taiwan's two major trading partners, the United States and Japan, together supplied much larger shares of its imports than they purchased of its exports, as shown in Table 10.14. This may be explained by U.S. aid tying until the mid-1960s, the availability of long-term credits from both countries throughout the period, and Taiwan's continued reliance on American and Japanese machinery and equipment.

The decline over time in the coefficients of geographical concentration suggests that Taiwan has broadened its trade relations in the process of diversifying the commodity composition of its trade. In the late 1970s, however, Taiwan came to rely more heavily on the U.S. market for its labor-intensive manufactures, as shown by the increased coefficient of the geographical concentration of exports in 1976.

Table 10.15 gives summary balance of payments data for 1952–76. Until the mid-1960s the deficits in the trade balance were more or less covered by transfer payments, most of which came from the United States in the form of grants. Subsequently, the place of foreign aid was taken by inflows of long-term capital. By 1976 the trade surplus and the inflow of long-term capital had resulted in a substantial accumulation of reserves.

The inflow of long-term capital appears to have contributed to export expansion in Taiwan. According to the results of a survey conducted by the Investment Commission, Ministry of Economic Affairs, exports by private foreign and overseas Chinese firms amounted to US$2.2 billion, or 29 percent of Taiwan's total exports, in 1976. Foreign investment has played an especially important role in the export of electronics products and electrical appliances: In 1976 foreign and overseas Chinese firms accounted for 82 percent of Taiwan's exports of these products (Table 10.16).

Factors Affecting Changes in Exports

We shall next analyze factors affecting changes in Taiwan's exports by applying a procedure earlier used

Table 10.12. *Taiwan: Major Export Commodities, 1952–76*
(percent)

	1952	1955	1960	1965	1970	1975	1976
Agricultural Products							
Rice and Paddy	10.6	23.3	3.1	9.1	0.1	0.0	0.0
Bananas	2.4	3.1	3.7	10.8	2.2	0.4	0.2
Processed Agricultural Products							
Sugar	67.2	49.9	44.0	13.1	3.2	5.0	1.9
Tea	5.3	4.4	3.7	2.0	0.9	0.4	0.2
Canned Pineapple	1.9	4.2	4.8	3.8	1.4	0.3	0.2
Canned Mushrooms	-	-	-	4.3	2.2	0.9	0.7
Canned Asparagus Spears	-	-	-	2.3	2.3	1.5	1.2
Manufactured products							
Plywood	-	0.1	1.5	5.9	5.5	2.5	2.3
Textiles	0.1	0.9	11.6	10.3	13.8	10.1	10.0
Cement	0.7	-	0.7	1.9	0.7	0.1	0.2
Clothing and Footwear	0.8	1.4	2.6	4.9	16.8	20.4	20.7
Plastic Articles	-	-	-	2.6	5.1	6.5	6.5
Electrical Machinery and Appliances	-	-	0.6	2.7	12.3	14.0	15.7
Nonelectrical Machinery	-	-	-	1.3	3.2	4.4	4.0
Transport Equipment	-	-	-	0.4	0.9	2.2	2.5
Metal Products	-	-	0.6	1.1	1.9	2.6	3.0
Basic Metals	0.8	1.6	3.7	3.6	4.4	2.3	1.6
Total Exports	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Value in Million U.S. Dollars	13	12	164	450	1,481	5,309	8,166
Percentage Shares of GDP (at current prices)							
Exports	8.5	8.2	11.2	18.4	29.5	41.0	51.9
Imports	19.7	12.5	18.7	21.6	29.6	44.5	49.0

Table 10.13. *Taiwan: Coefficients of Commodity Concentration and Geographical Concentration of Trade, 1955–76*

	Commodity Concentration		Geographical Concentration	
	Exports	Imports	Exports	Imports
1955	56.48	23.83	59.89	56.92
1960	46.17	21.35	45.35	52.41
1965	24.17	19.87	40.05	51.40
1970	22.35	17.17	44.24	49.68
1975	23.18	17.84	38.81	42.75
1976	22.77	20.04	41.32	41.96

Note: The coefficient of commodity concentration of exports is defined as

$$C_X = 100 \sqrt{\sum_i \frac{x_i}{x}}$$

where X_i = the value of exports of commodity i by Taiwan to the rest of the world,
and X = the total value of exports by Taiwan to the rest of the world.

The coefficient of commodity concentration of imports is defined in the same manner, except that the symbols in the above formula now refer to imports instead of exports.

The calculation has been made using the SITC three-digit commodity classification. SITC three-digit commodity groups numbered 177 in the revised classification (1961-76), and 150 for the earlier data (1955-60). Therefore, the coefficients for years 1955 and 1960 have an upward bias because the computation is based on a less aggregated commodity classification than is available for years 1961-76.

The coefficient of geographical concentration (Gx) has been defined in an analogous manner; X_i now refers to Taiwan's exports (imports) to (from) country i.

Source: Chinese Maritime Customs, The Trade of China (various years).

Table 10.14. *Taiwan: Exports to and Imports from the United States and Japan as Percentage of Total Exports and Imports, 1953–76*

	Exports			Imports		
	United States	Japan	Together	United States	Japan	Together
1953	4.2	45.6	49.8	38.5	30.6	69.1
1955	4.4	59.5	63.9	47.5	30.5	78.0
1960	11.5	37.7	49.2	38.1	35.3	73.4
1965	21.3	30.6	51.9	31.7	39.8	71.5
1970	39.5	15.1	54.6	23.9	42.8	66.7
1975	34.3	13.1	47.4	27.8	30.6	58.4
1976	37.2	13.4	50.6	23.7	32.3	56.0

by Stern.[29] Our analysis covers the period 1962–72 and excludes the subsequent years of the oil crisis and the world recession. We adopt the following notation:

X = value of Taiwan's exports in 1962
X' = value of Taiwan's exports in 1972
r = the ratio of 1972 world exports to those in 1962
i = commodity groups: food, beverages, and tobacco (SITC 0 and 1); crude materials, oils and fats (SITC 2 and 4); mineral fuels and related materials (SITC 3); chemicals (SITC 5); machinery and transport equipment (SITC 7); and other manufactured goods (SITC 6 and 8)
j = developed and developing areas.

The effect of an increase in total world trade on Taiwan's exports by commodity class is estimated as

$$\sum_i rX_i - \sum_i X_i \quad \text{or} \quad \sum_i X_i(r-1).$$

The effect of the commodity composition of an increase in world trade on Taiwan's exports, given the latter's 1962 product mix, is estimated as

$$\sum_i r_i X_i - \sum_i rX_i.$$

The effect of the area distribution of the increase in world trade on Taiwan's exports, given the latter's 1962 geographical structure, is estimated as

$$\sum_i \sum_j r_{ij} X_{ij} - \sum_i r_i X_i.$$

Estimated as follows, the residual then indicates the part of the increase in Taiwan's exports that can be attributed to its improved competitiveness:

$$\sum_i \sum_j x'_{ij} - \sum_i \sum_j r_{ij} x_{ij}.$$

The results of these calculations are presented in Table 10.17. All the data are in current prices since appropriate deflators were not available. The four factors shown in Table 10.17 are assumed to be independent and additive. The numerical results should be interpreted with caution because of the limitations of the method of calculation, the data, and the level of aggregation.

The increase in the value of world trade accounts for less than 24 percent of the increase in Taiwan's total exports during 1962–72, while the effects of Taiwan's initial 1962 commodity composition and market distribution were small and negative. The negative result for the commodity composition implies that world trade

Table 10.15. *Taiwan: Balance of Payments, 1952–76*
(million U.S. dollars)

	1952	1955	1960	1965	1970	1975	1976
A. Goods and Services							
Exports	119.50	127.10	164.00	450.77	1,468.60	5,304.05	7,805.54
Imports	-208.30	-184.70	-286.52	-517.21	-1,363.38	-5,558.61	-7,105.56
Nonmonetary Gold	1.90	1.10	-0.66	-0.39	0.04	0.06	-15.47
Commodity Trade Balance	-86.90	-56.50	-123.18	-66.83	105.26	-254.50	684.51
Services	-12.60	-14.40	-6.80	-22.34	-118.41	-341.52	-391.62
Total Trade Balance	-99.50	-70.90	-129.98	-89.17	-13.15	-596.02	292.89
B. Transfer Payments							
U.S. Aid Grants	92.60	90.40	89.16	26.09	-	-	-
Other Transfer Payments	3.80	1.30	-0.90	6.78	13.94	7.55	20.32
Total	96.40	91.70	88.26	32.87	13.94	7.55	20.32
C. Current Balance (A & B)	-3.10	20.80	-41.72	-56.30	0.79	-588.47	313.21
D. Long-term Capital	2.10	4.30	32.92	55.81	122.94	642.63	624.48
E. Basic Balance (C & D)	-1.00	25.10	-8.80	-0.49	123.72	54.16	937.69
F. Net Errors and Omissions	2.10	2.20	4.68	-11.39	-0.18	22.29	-113.44
G. Short-term Capital	0.80	1.00	5.53	-2.96	70.13	-67.83	205.16
Overall Balance(E + F + G)	1.90	28.30	1.41	-14.84	193.68	9.32	1,029.41
Net Foreign Assets of the Banking System	-1.90	-28.30	-1.41	14.84	-193.68	-9.32	-1,029.41

Note: Export value: f.o.b. Import value: c.i.f. for 1952,1955,1960; f.o.b. for 1965-76.

Source: Economic Research Department, Central Bank of China, Balance of Payments, the Republic of China (Taipei), various years.

Table 10.16. *Taiwan: Value of Exports by Private Foreign and Overseas Chinese Firms as Percentage of Total Exports, 1976*

	Overseas Chinese	Foreign	Total
Food and Beverages	3.41	3.07	6.48
Textiles	6.74	11.77	18.51
Wearing Apparel and Finished Textile Products	13.13	11.08	24.21
Nonmetallic Products	3.77	6.21	9.98
Metal Products	2.01	13.49	15.50
Machinery and Instruments	0.68	13.33	14.01
Electronic Products and Electrical Appliances	2.19	80.24	82.43
Others	9.62	13.48	23.10
Total	6.29	22.33	28.62

Note: The sample consisted of 766 firms, of which 260 were overseas Chinese and 506 foreign firms. Exports by these firms included both direct and indirect exports, and were not adjusted for the proportions of equity owned by local, overseas Chinese, and foreign shareholders.

Source: Investment Commission, Ministry of Economic Affairs, Survey Report on the Operation of Private Foreign and Overseas Chinese Firms and Their Contribution to the Economy of the Republic of China, 1976 (Taipei, 1978; in Chinese), p. 7.

Table 10.17. *Taiwan: Sources of Change in Exports, by Commodity Class, 1962–72*
(thousand U.S. dollars at current prices)

	Food, Beverages, and Tobacco	Crude Materials, Oils and Fats	Mineral Fuels and Related Materials	Chemicals	Machinery and Transport Equipment	Other Manufactured Goods	Total
Exports in 1962	100,766	14,291	9,536	15,629	3,722	105,264	249,208
Exports in 1972	264,008	54,803	4,469	39,540	578,837	1,380,075	2,321,732
Changes in Exports, 1962-72	163,242	40,512	-5,067	23,911	375,115	1,274,811	2,072,524
Due to Increase in Value of World Trade	201,531	28,582	19,072	31,258	7,444	210,528	498,416
Due to Commodity Composition	-77,389	-15,148	-582	6,455	3,770	18,105	-64,788
Due to Market Distribution	-1,177	818	-8,786	-3,740	-3,364	-55,576	-71,824
Due to Increased Competitiveness	40,277	25,260	-14,771	-10,062	567,265	1,101,754	1,710,720

Sources: United Nations, Monthly Bulletin of Statistics, March 1968, March 1971, and September 1974; Chinese Maritime Customs, The Trade of China, 1962 and 1972.

grew slightly less rapidly than the average rate in those commodities (notably food) in which Taiwan specialized in the initial year. Similarly, export demand grew less than proportionately in those markets in which Taiwan's exports were concentrated in 1952. The residual portion, which is taken to measure the increase in Taiwan's exports that was due to increased competitiveness, accounted for more than 80 percent of the total increase during the period considered.

Much of Taiwan's export expansion can thus be attributed to increases in domestic supply rather than to the general growth in world import demand. Although both price and nonprice factors were at work, Taiwan's improved ability to compete in world markets owes much to its outward-oriented development strategy.

Among individual product groups, Taiwan's exports of food, crude materials, machinery and transport equipment, and other manufactured goods experienced large competitive gains. The opposite result for mineral fuels and related materials reflects the fact that Taiwan is poor in mineral resources. In the case of chemicals, the rapid increase of domestic demand limited the exportable surplus of those chemicals already in production, while the small size of the domestic market coupled with the scarcity of capital in Taiwan inhibited the manufacture of chemical products that require large-scale, capital-intensive techniques.

Sources of Growth in Manufacturing

The sources of growth in manufacturing were examined from the side of demand by applying a method introduced by Chenery.[30] The data on manufacturing production, imports, and exports are expressed in current prices, since relevant deflators were not available. Table 10.18 provides estimates of the relative contributions of domestic demand, exports, and import substitution derived using the formula

$$O = (u_2 - u_1)S_2 + u_1 H + u_1 X,$$

where O denotes the domestic production of manufactures; S the total supply of manufactures (the sum of the domestic production of manufactures and manufactured imports); H the domestic demand for manufactures; X manufactured exports; u equals O/S; and subscripts 1 and 2 refer to the first and second periods, respectively.

In the formula, the first term represents import substitution, the second the increase in domestic demand, and the third, export expansion. Import substitution is thus defined with reference to the proportion of domestic production in total supply in the first period; whenever domestic production increases faster than imports, import substitution is said to take place. The relative effects of increased domestic demand and export expansion are estimated by assuming that the ratio of domestic production to total supply remained constant at the level of the first period.

Estimates were made for the period 1953–75 as well as for five subperiods: the early aid period, 1953–55; the middle aid period, 1955–60; the late aid period, 1960–65; and the post-aid periods, 1965–70 and 1970–75. For 1953–75 as a whole, increased domestic demand appears to have been the major source of industrial growth. It accounted for 79 percent of the growth in manufacturing output, while exports accounted for 25 percent and the contribution of import substitution was negative. The contribution of exports increased over time, whereas the opposite trend was shown for import substitution.

This finding for Taiwan contrasts with Chenery's conclusion that in many economies import substitution has provided an important impetus to industrial development.[31] The growth of the import content of total supplies in Taiwan has been caused both by the expansion in industrial capital formation[32] and by the increased use of imported inputs for export processing. This trend has accelerated since the relaxation of import controls.

Although the sources of growth in Taiwan differ among industries, a few findings stand out from Table 10.18. First, in nondurable consumer goods, especially textiles, import substitution was an important source of growth during the early 1950s. The import-substitution effect was negative during 1955–70. The positive effect of import substitution in 1970–75 was the result of backward linkages that raised the share of inputs produced domestically. Export expansion was a major source of output growth in these industries during the post-aid period after 1965. The basis of export expansion lies in the exploitation of comparative cost differences in labor-intensive products. Second, in intermediate goods industries, the major source of growth was domestic demand, but export expansion became more and more important in the 1960s. In these industries, import substitution had a noticeable effect on growth only during the early 1960s. Third, the import content of metals and machinery decreased steadily; import substitution contributed to the growth of these industries up to the end of the 1960s. Although the expansion of domestic demand was the dominant source of growth in metals and machinery, export demand has become increasingly important, accounting for more than one fifth of the growth of output in the post-aid period. Fourth, the food, beverages, and tobacco industries were well established, and domestic demand was largely met by domestic production. Export expansion has become important since the mid-1950s.

On the whole, domestic demand continued to absorb a major proportion of manufacturing output, but export

Table 10.18. *Taiwan: Sources of Change in Manufacturing Output, by Industry Group, 1953–75*
(percentage distribution for each group)

	Domestic Demand	Export Expansion	Import Substitution
1953-75			
Total Manufactured Products	79.4	24.5	-3.9
Food, Beverages, and Tobacco	82.9	13.9	3.2
Nondurable Consumer Goods	40.7	54.6	4.6
Intermediate Goods	89.0	8.6	2.4
Metals and Machinery	63.6	17.1	19.3
1953-55			
Total Manufactured Products	99.6	-8.7	9.0
Food, Beverages, and Tobacco	135.8	-56.4	20.6
Nondurable Consumer Goods	75.2	2.5	22.4
Intermediate Goods	99.4	0.5	0.1
Metals and Machinery	80.5	1.5	18.0
1955-60			
Total Manufactured Products	91.7	16.5	-8.1
Food, Beverages, and Tobacco	63.8	34.8	1.4
Nondurable Consumer Goods	84.5	21.2	-5.7
Intermediate Goods	96.2	5.5	-1.6
Metals and Machinery	93.4	3.9	2.7
1960-65			
Total Manufactured Products	82.5	13.8	3.6
Food, Beverages, and Tobacco	89.0	9.4	1.5
Nondurable Consumer Goods	74.7	27.5	-2.2
Intermediate Goods	77.9	12.8	9.3
Metals and Machinery	75.4	8.6	16.0
1965-70			
Total Manufactured Products	76.1	31.2	-7.3
Food, Beverages, and Tobacco	92.4	7.3	0.2
Nondurable Consumer Goods	32.1	74.2	-6.3
Intermediate Goods	87.9	14.1	-1.9
Metals and Machinery	72.9	20.7	6.3
1970-75			
Total Manufactured Products	75.5	23.3	1.2
Food, Beverages, and Tobacco	86.6	15.5	-2.0
Nondurable Consumer Goods	38.8	54.0	7.2
Intermediate Goods	93.8	7.9	-1.7
Metals and Machinery	81.0	23.7	-4.7

demand has become increasingly important. It should be added that these estimates understate the full contribution of export growth since they take no account of the derived demand for domestically produced intermediate inputs,[33] the multiplier effects of the increased consumption and investment of the additional income earned through export expansion, the exploitation of economies of scale made possible by increased market size, or the motivation that competition in foreign markets provides for technological improvement. There is every indication that export expansion has played a dominant role in Taiwan's development.

Factor Allocation and Use

Taiwan's outward-looking strategy has permitted the country to exploit its comparative advantage and to reap the gains from trade predicted by the traditional theory of international trade. This section examines the extent to which the resulting pattern of trade has conformed to the factor proportions theory of international trade, and indicates the effects of export expansion on employment and income distribution.

Comparative Advantage and Export Expansion

Compared with developed countries, Taiwan is poorly endowed with capital and skilled labor. The hypothesis will be tested that, apart from resource-intensive products, Taiwan's comparative advantage in trade with developed countries lies in industries that are intensive in unskilled and semiskilled labor. Inasmuch as Taiwan is probably more richly endowed with capital and skilled labor than most developing countries, a second hypothesis to be tested is that Taiwan tends to export to less developed countries the manufactured products that make more intensive use of capital and skilled labor.[34] Although the numerical results should be interpreted with caution in view of the limitations inherent in the statistical data, they appear to be unambiguous and can be taken as indicative of the determinants of the trade pattern of Taiwan.

Average capital-labor ratios and skill ratios for the ten industry groups, weighted by production volumes, are presented in Table 10.19. In Taiwan's industry as a whole, the capital-labor ratio increased by 148 percent between 1966 and 1971. Since the GNP deflator for fixed capital formation increased by only 22 percent during the period, the data show the rapid accumulation of capital in Taiwan. A contributing factor has been the profitability of export industries in which Taiwan's comparative advantage lies.

Among the ten industry groups, intermediate products and construction materials were relatively capital intensive throughout 1966–71. Mining and energy, intermediate products I, and transport equipment have become increasingly capital intensive over time, possibly because of the introduction of more sophisticated equipment.

The average skill ratio increased by 22 percent during the period considered. Skill ratios changed in various industry categories but remained highest in machinery production. This industry appears to be next in line for the broadening of the export base as the economy moves toward more skill-intensive production and exports.

Average capital-labor ratios and skill ratios for the four trade categories of industry and for primary and manufacturing activities, also weighted by production volumes, are shown in Table 10.20. Little significance can be attached to the estimated capital-labor ratios and skill ratios for primary activities, both because the value of land is excluded from the calculation of capital and because the allocation of data on capital and skilled employment among different crops involves considerable error. In the case of manufacturing alone, export industries were less capital and skill intensive than XIC industries, and the latter were less capital and skill intensive than import-competing industries. In turn, the low capital-labor and skill ratios observed for non-import-competing industries are explained by the relatively low capital intensity and skill intensity of the production of edible vegetable oils, cement products, and miscellaneous and nonmetallic mineral products.

In comparison with the overall averages, export industries also showed a trend toward lower capital intensity and higher skill intensity over time. Increases in the skill intensity of manufactured goods are explained by the shift of Taiwan's comparative advantage toward products that require skilled and technical labor.[35]

Value added per employee indicates an industry's total capital intensity, since it reflects the use in the production process of both human and physical capital.[36] The relevant data are shown in Table 10.20. Considering manufacturing alone, the conclusions drawn from data on capital-labor ratios and skill ratios are reconfirmed. Thus, it appears that export industries are the least intensive in physical or human capital, followed by XIC industries, and that import-competing industries are the most intensive in physical and human capital. However, non-import-competing industries are now in the middle of the range.

Capital-labor ratios and skill ratios have also been calculated for exports to selected areas and countries. The results reported in Table 10.21 show that exports to developed countries are of relatively low capital and skill intensity and that the reverse is true of exports to developing countries. The geographical pattern of

Table 10.19. *Taiwan: Weighted Average Capital-Labor Ratios and Skill Ratios, by Industry Group, 1966 and 1971*

	Capital-Labor Ratio		Skill Ratio	
	1966	1971	1966	1971
Agriculture, Forestry, and Fishing (I)	27.57	49.07	0.1499	0.1885
Mining and Energy (IV)	44.40	102.35	0.5371	0.5390
Primary Activities (I + IV)	29.53	52.91	0.1778	0.2138
Processed Food (II)	35.78	46.80	0.2520	0.2175
Tobacco and Beverages (III)	39.24	33.47	0.2932	0.1245
Construction Materials (V)	99.89	190.40	0.4865	0.5377
Intermediate Products I (VIA)	122.04	366.70	0.4967	0.5929
Intermediate Products II (VIB)	72.63	158.20	0.4553	0.4955
Nondurable Consumer Goods (VII)	49.01	115.12	0.4444	0.5321
Consumer Durables (VIII)	50.76	78.46	0.5623	0.4488
Machinery (IX)	47.27	95.43	0.6008	0.6099
Transport Equipment (X)	47.36	123.87	0.5587	0.4713
Manufacturing, less Beverages and Tobacco (II, V-X)	72.58	159.14	0.4406	0.4624
All Industries, less Beverages and Tobacco (I, II, IV-X)	55.02	137.74	0.3352	0.4152
Manufacturing (II, III, V-X)	69.99	154.15	0.4292	0.4823
All Industries (I-X)	54.26	134.41	0.3332	0.4059

Source: Derived from Kuo-shu Liang and Ching-ing Hou Liang, "Exports and Employment in Taiwan," in Conference on Population and Economic Development in Taiwan (Taipei: Institute of Economics, Academia Sinica, 1976), Appendix Tables 7 and 8.

Table 10.20. *Taiwan: Weighted Average Capital-Labor Ratios and Skill Ratios by Trade Category, 1966 and 1971, and Value Added per Worker, 1969*

	Capital-Labor Ratio		Skill Ratio		Value Added per Worker 1969	
	1966	1971	1966	1971	Balassa	Corden
Export Industries	52.68	105.35	0.3260	0.4122	26.02	35.40
Primary Activities	24.30	48.54	0 2961	0.3725	14.03	15.49
Manufacturing	64.73	124.08	0.3387	0.4253	30.95	43.59
Export-and-Import-Competing Industries	64.84	146.46	0.4645	0.5072	42.17	60.73
Primary Activities	110.03	68.66	0.3436	0.6009	88.92	93.70
Manufacturing	60.81	146.56	0.4755	0.5067	40.16	59.32
Import-Competing Industries	75.05	280.69	0.3741	0.4404	28.70	76.32
Primary Activities	19.27	101.31	0.1096	0.2159	30.35	32.40
Manufacturing	96.10	356.22	0.4738	0.5350	49.38	113.81
Non-Import-Competing Industries	29.88	44.68	0.2015	0.2063	28.98	47.25
Primary Activities	25.92	32.70	0.1492	0.1417	20.22	23.44
Manufacturing	46.52	52.85	0.3715	0.2152	40.89	79.61
All Industries	54.26	134.41	0.3332	0.4059	35.39	55.51
Primary Activities	29.53	52.91	0.1778	0.2138	25.10	27.74
Manufacturing	69.99	154.15	0.4292	0.4823	39.72	67.20

Note: Value added is defined in two alternative ways, depending on whether it includes (Corden method) or excludes (Balassa method) value added in the production of nontraded goods.

Sources: Capital-labor and skill ratios: Kuo-shu Liang and Ching-ing Hou Liang, "Exports and Employment in Taiwan," Appendix Tables 7, 8, and 9. Value added per worker: T. H. Lee, Kuo-shu Liang, Chi Schive, and Ryh-song Yeh, "The Structure of Effective Protection and Subsidy in Taiwan," Economic Essays, vol. 6 (November 1975), p. 168, Appendix Table 4 and Appendix C.

Table 10.21. *Taiwan: Capital-Labor Ratios and Skill Ratios of Exports to Selected Areas and Countries, 1966 and 1971*

	Capital-Labor Ratio		Skill Ratio	
	1966	1971	1966	1971
Developed areas	41.56	104.30	0.2546	0.4206
United States	45.11	105.55	0.3254	0.4450
Japan	44.36	105.22	0.2180	0.3606
EEC	20.02	88.28	0.1531	0.3729
Other Developed Countries	48.83	117.10	0.3192	0.4339
Less Developed Areas	68.90	154.42	0.4143	0.4629
Hong Kong	61.48	150.85	0.3811	0.4624
Viet Nam	82.41	251.45	0.4901	0.5171
Other Less Developed Countries	75.06	138.60	0.3620	0.4552

Source: Kuo-shu Liang and Ching-ing Hou Liang, "Exports and Employment in Taiwan," Table 19.

Taiwan's trade thus conforms to the factor proportions explanation of international trade, since in its endowment of physical and human capital Taiwan occupies an intermediate position between developed and developing countries.

Effects of Exports on Employment

Increases in exports create jobs for workers producing the exports. In addition to this direct employment effect, jobs will be created indirectly if the raw materials and machinery used in export production are domestically supplied. Also, new jobs will be created in supporting service industries such as electricity, water supplies, transport, warehousing, communications, and finance and insurance.[37]

The direct employment effect of industry i, E_i^d, can be estimated by:

$$E_i^d = \sum_j a_{ij} \frac{L_j}{Q_j} E_i,$$

where a_{ij} = direct requirement of domestic input j per unit of output i
L_j = labor input of industry j
Q_j = domestic input of industry j
E_i = export of industry i.

In turn, the direct and indirect employment effect of industry i, E_i^t, can be estimated by the use of:

$$E_i^t = \sum_j r_{ij} \frac{L_j}{Q_j} E_i,$$

where r_{ij} = elements of the matrix of direct and indirect requirements of domestic input j per unit of output i.

The direct and indirect effects of exports accounted for 23 percent of the employment generated by all industries in 1966, and for 31 percent of that in 1971; in manufacturing (less beverages and tobacco), the corresponding figures were 56 and 54 percent, respectively. Comparing direct and indirect employment effects by industrial groups classified according to trade orienta-

Table 10.22. *Taiwan: Direct and Indirect Employment Effects of Exports, by Trade Category, 1966 and 1971*
(man-years)

	1966			1971		
	Direct Effect	Indirect Effect	Total	Direct Effect	Indirect Effect	Total
Export Industries	160,625	68,768	229,393	194,473	89,404	283,877
Export-and-Import-Competing Industries	67,595	103,791	171,386	292,703	152,605	445,308
Import-Competing Industries	18,554	40,165	58,719	20,047	45,799	65,846
Non-Import-Competing Industries	40,179	78,496	118,675	8,590	133,584	142,174
Primary Industries	121,161	101,236	222,397	107,086	179,004	286,090
Manufacturing, less Beverages and Tobacco	165,254	189,644	354,898	406,942	236,779	643,721
All Industries	286,953	291,220	578,173	515,813	421,392	937,205

Sources: Derived from Council for Economic Co-operation and Development, Taiwan's Interindustry Transactions Tables for 1966 and 1971 (Taipei, 1975); and Kuo-shu Liang and Ching-ing Hou Liang, "Exports and Employment in Taiwan."

tion, we find that export-induced direct and indirect labor requirements as a percentage of total employment were highest in XIC industries, followed by export industries (Table 10.22). These two industry groups contributed substantially to employment creation in Taiwan, owing to their relatively high labor intensity (Table 10.20) and rapid export expansion.

On the average, the direct and the indirect employment effects of exports were of similar magnitude. Non-import-competing industries and XIC industries had larger indirect effects than direct ones. This may be explained by the relatively high content of domestic material in these industries as well as by the relatively labor-intensive nature of their domestically produced inputs.

The sectoral distribution of the labor force by sex indicates the important role that female workers have played in the economic development of Taiwan. Between 1965 and 1976 the average annual growth of female employment (5.7 percent) was substantially faster than that of male employment (3.2 percent).[38] In the same period, female employment in agriculture increased at an average annual rate of 0.5 percent while male employment declined by 1.1 percent. Female employment also increased more rapidly in the manufacturing and the service sectors.

In manufacturing alone, the average annual rate of growth of female employment (13.5 percent) was almost twice that of male employment (6.9 percent). The rapid development of labor-intensive export industries induced the large-scale entry of women into manufacturing operations. Most of the new female recruits were unskilled and between sixteen and twenty-four years of age, and most entered processing industries such as textiles, wearing apparel, leather products, and communication equipment and apparatus. In December 1976, 50 percent of all women employed in manufacturing were in these industries, compared with 17 percent of the men.[39] At the same time in the export processing zones 83 percent of the workers were women, of whom 70 percent were sixteen to twenty-four years old.[40]

In 1965–76 agricultural employment declined at an average rate of 0.6 percent a year, while employment in manufacturing and services rose by 9.0 and 6.8 percent a year, respectively. The absolute size of the agricultural labor force began to decline around 1969 as rural-urban migration accelerated in the late 1960s.

Distributive Implications of Export Expansion

Taiwan's outward-oriented development shows that a developing country can increase employment and output by adopting a development strategy that follows its comparative advantage. Table 10.2 shows that the average annual rate of growth of employment in manufacturing far exceeded that of population.[41] At the same time, the unemployment rate fell from a peak of 6.5 percent in 1952 to 2.6 percent in 1976.

The rapid development of labor-intensive export industries, the land reform program, and mass education have contributed to the equitable allocation of the fruits of economic growth. Data compiled by the World Bank for the mid-1960s indicate a high degree of income equality in Taiwan compared with other developing countries, whether measured by the ratio between the incomes of the richest and the poorest households or by the Gini coefficient of income distribution.[42]

Data on the quintile distribution of household incomes (Table 10.23) also indicate that income distribution became more equitable over time. Thus, while the income share of the highest 20 percent was 5.3 times that of the lowest 20 percent in 1964, this ratio had declined to 4.2 in 1975. The decline occurred after 1969 when the absolute size of the agricultural labor force began to decline and the rise of real wages in manufacturing accelerated; in 1970–75 real wages in manufacturing rose at an average annual rate of 7.5 percent. Nevertheless, caution is necessary in interpreting these numerical results, because large fortunes that were probably made during the process of rapid export expansion may have escaped the sample of the family income survey.

Gini coefficients by sector computed from family income survey data by Chang and Kuo confirm these results. Until 1968 the data do not display a clear trend, apart from the decline in inequality shown for farm families, but the Gini coefficient fell to a considerable extent after that year.

The decline in income inequality among farm families in the early years under review may be explained by the rent reductions that resulted from the land reform program and subsequent increases in land productivity associated with reliance on a labor-intensive, land-saving type of multiple cropping. Subsequently, a major factor contributing to increases in the incomes of farm families has been the rise in earnings from nonfarm activities. In conjunction with the regional decentralization of industry, the share of off-farm earnings in farm family income increased from 23.6 percent in 1967 to 35.7 percent in 1975.[43]

It appears, then, that in Taiwan the rapid expansion of a labor-intensive export-oriented manufacturing sector has contributed to labor absorption and to improved income distribution. The expansion of employment opportunities has pulled workers from low-paying agricultural sector jobs to higher paying manufacturing employment. At the same time, the geographically dispersed development of labor-intensive export-oriented light manufactures has permitted many industrial workers to commute from rural areas rather than to migrate.[44]

Summary and Conclusions

Taiwan's post–World War II economic development may be divided into two periods. The incentive policies pursued until the late 1950s were those typically associated with a strategy of import substitution. The multiple exchange rate system and strict import controls that were adopted by the government during this period favored industrial expansion oriented toward domestic markets. At the same time, the preferential allocation of undervalued foreign exchange for imported raw materials and capital equipment encouraged expansion even when existing capacity was underutilized.

The easy phase of import substitution appeared to reach its limit in a relatively short time in the protected and narrow domestic market. In response to low capacity utilization in industry and the poor growth prospects associated with continued inward orientation, the government introduced a series of major policy reforms during 1958–61. The overvalued currency was devalued, and the complicated exchange rate structure was

Table 10.23. *Taiwan: Distribution of Household Income, 1964–75*

	1964	1966	1969	1970	1972	1974	1975
A. Percentage Shares of Income by Quintiles of Households							
Lowest	7.7	7.9	7.8	8.4	8.6	8.8	8.9
2nd	12.6	12.4	12.2	13.3	13.2	13.5	13.6
Middle	16.6	16.2	16.3	17.1	17.1	17.0	17.3
4th	22.0	22.0	22.3	22.5	22.5	22.1	22.3
Highest	41.1	41.5	41.4	38.7	38.6	38.6	37.9
Ratio of the income share of the highest 20% to that of the lowest 20%	5.3	5.3	5.3	4.6	4.5	4.4	4.2

	1964	1966	1968	1970	1971	1972	1973	1974	1975
B. Gini Coefficients									
All Families (1)	0.357	0.359	0.362	0.321	0.315	0.313	0.320	0.316	0.304
(2)	0.328	0.330	0.335	0.299	0.301	0.295	n.a.	n.a.	n.a.
Nonfarm Families (1)	0.365	0.359	0.366	0.308	0.308	0.283	0.319	0.314	0.296
(2)	0.336	0.332	0.338	0.285	0.292	0.288	n.a.	n.a.	n.a.
Farm Families (1)	0.342	0.356	0.316	0.308	0.320	0.315	0.294	0.314	0.303
(2)	0.315	0.326	0.292	0.283	0.297	0.291	n.a.	n.a.	n.a.

Sources: Percentage Shares: Directorate-General of Budget, Accounting and Statistics Executive Yuan, A Report on Personal Income Distribution in Taiwan Areas, Republic of China, 1964-1975 (Taipei, 1977), p. 6.

Gini Coefficients: (1) Han-yu Chang, "Income Disparity under Economic Growth in Taiwan: Over Time Changes and Degree as Compared with Other Countries," Industry of Free China (June 1977), pp. 11-12, Tables 4.1-4.3.

(2) Wan-yong Kuo, "Income Distribution by Size in Taiwan Areas: Changes and Causes," Income Distribution, Employment and Economic Development in Southeast and East Asia, vol. 1 (Tokyo: The Japan Economic Research Center, 1975), p. 96, Table 7.

simplified and finally unified in June 1961. Laws and regulations governing investment and imports were liberalized. The emphasis of trade policy was shifted from import controls to export promotion.

To a considerable extent, Taiwan's excellent economic performance during the 1960s and early 1970s can be attributed to its outward-oriented development policies. To begin with, marked changes in the commodity composition and geographical distribution of Taiwan's exports over time provide evidence of successful transformation. Furthermore, available information indicates that domestic supply, rather than foreign demand, explains most of the expansion of exports. Finally, in contrast with the findings of Chenery, Shishido, and Watanabe, exportation rather than import substitution has been an important factor contributing to economic growth. Thus, although domestic demand has continued to absorb a major proportion of manufacturing output, export demand has become increasingly important over time.

Taiwan provides an example of an economy following its comparative advantage and reaping the gains from trade in accordance with traditional theory of international trade. On the whole, Taiwan's exports have been of low capital and skill intensity, and there have been considerable geographical differences in the factor intensity of exports. As a result, exports to developed countries have been relatively labor intensive and of low skill intensity, whereas exports to developing countries have been relatively capital intensive as well as skill intensive. The resulting pattern of trade conforms to expectations, since Taiwan's factor endowments place it in an intermediate position between developed and developing countries.

The rapid expansion of exports to the developed countries has provided increased opportunities for the growing labor force and has made it possible to achieve the twin objectives of output growth and employment growth. In particular, employment generated directly and indirectly by exports accounted for 56 percent of the employment in manufacturing (other than beverages and tobacco) in 1966, and for 54 percent in 1971. Female workers have come to play an important part in the economic development of Taiwan because the rapid growth of labor-intensive export industries induced the large-scale entry of women, primarily young and unskilled, into manufacturing.

The expansion of employment in manufacturing has also pulled workers from low-paying agricultural sector jobs to higher paying manufacturing employment and has helped to raise wages. At the same time, policies to reduce domestic distortions and encourage labor-intensive production for export have created profitable opportunities and thereby have encouraged capital accumulation. These policies appear to have increased simultaneously the supply of capital, employment opportunities, and the output per unit of capital. Investors and workers have benefited as a result, but the greater relative benefits have probably accrued to workers because of the rapid growth of employment in labor-intensive export industries and because of rapidly rising wage rates. While income distribution was equitable compared with that in many other developing countries, income inequalities declined further after 1969 when the farm labor force fell in absolute terms and unemployment shrank.

Our findings indicate that export orientation has played a dominant role in Taiwan's development. The expansion of manufactured exports has contributed to efficient industrialization by permitting specialization according to comparative advantage and by stimulating technological improvement; it has also improved living standards as well as income distribution through the creation of productive employment.

Even though the renewed pressure for protection in the developed countries has been a matter of concern, it should be recognized that Taiwan and other countries following outward-oriented policies were able to weather the 1974–75 recession better than countries that followed inward-oriented policies. It would be desirable to continue outward orientation in Taiwan, but this course of action would involve upgrading the traditional exports that rely on unskilled labor and developing exports that are intensive in skilled labor.

Special emphasis needs to be given to machinery that is skill intensive and has relatively low capital costs.[45] The availability of a literate and trainable working force is Taiwan's most important resource, since world market prospects are better for skill-intensive products than for those using unskilled labor. Machinery could be next in line to achieve a high rate of export expansion, since the growth of experience and capacity in manufacturing will permit the economy to move beyond simple labor-intensive types of production.

Present and future policies should concentrate on improving the ability of Taiwan's economy to adjust to changing internal and external conditions. Failure to recognize the dynamic nature of comparative advantage would freeze capital, labor, and other scarce resources in industries where opportunities are declining, and would lead to the neglect of advantageous new export opportunities.

Notes to Chapter 10

1. N. H. Jacoby, *U.S. Aid to Taiwan: A Study of Foreign Aid, Self-Help and Development* (New York: Frederick A. Praeger, 1966), p. 118.

2. Ching-yuan Lin, *Industrialization in Taiwan, 1946–72: Trade and Import-Substitution Policies for Developing Countries* (New York: Frederick A. Praeger, 1973), pp. 30–31.

3. Anthony M. Tang and Kuo-shu Liang, "Agricultural Trade in the Economic Development of Taiwan," in *Trade, Agriculture and Development*, ed. G. S. Tolley and P. A. Zadrozny (Cambridge, Mass.: Ballinger Publishing Co., 1973), pp. 116–17.

4. Teng-hui Lee, *Intersectoral Capital Flows in the Economic Development of Taiwan, 1895–1960* (Ithaca: Cornell University Press, 1971).

5. Kuo-shu Liang and Teng-hui Lee, "Process and Pattern of Economic Development in Taiwan," in *The Economic Development of East and Southeast Asia*, ed. Shinichi Ichimura (Honolulu: University Press of Hawaii, 1974), pp. 296–99.

6. See Fu-chi Liu, *Essays on Monetary Development in Taiwan* (Taipei: China Committee for Publication Aid and Prize Awards, 1970) p. 13.

7. Lin, *Industrialization in Taiwan*, pp. 50–51.

8. Maurice Scott, "Foreign Trade," in *The Economic Development of Taiwan, 1945–75: The Experience of the Republic of China*, ed. W. Galenson (Ithaca, N.Y.: Cornell University Press, 1979), pp. 315–16.

9. Tang and Liang, "Agricultural Trade in the Economic Development of Taiwan," p. 138.

10. Scott, "Foreign Trade." A somewhat smaller decline is shown if duty rebates to exporters are included in the figures. The relevant ratios are 43.0 percent in 1955, 31.7 percent in 1960, 26.1 percent in 1970, and 19.1 percent in 1976.

11. The government changed the minimum margin requirements from time to time as an instrument of selective credit controls.

12. Furthermore, bonded warehouses could be established to avoid the cumbersome problem of assessing and refunding taxes.

13. The government abolished income tax reductions for exports in December 1970.

14. A margin ranging from NT$1 to NT$4 per US$1 was generally paid by the transferee. Provisions for the transfer of retained or registered foreign exchange were abolished on July 30, 1970.

15. These subsidy schemes no longer exist. For instance, the cotton spinning scheme ended in 1972.

16. The levy was reduced to 0.04 percent between July 1974 and August 1975 as the economy was affected by the serious decline in global trade.

17. Export Processing Zone Administration, *Export Processing Zones Essential Statistics* (Taipei, 1975).

18. R. I. McKinnon, *Money and Capital in Economic Development* (Washington, D.C.: Brookings Institution, 1973), p. 114.

19. Owing to their administrative convenience, customs duties are a major traditional device for tax collection. In Taiwan they have been the largest item in central government revenues, and in fiscal year 1974 they accounted for 28 percent of total tax and monopoly revenues. See Economic Planning Council, *Taiwan Statistical Data Book 1975* (Taipei, 1976), p. 151, table 8–6a.

20. The defense surtax, which amounted to 30 percent of the tariff in 1969, was included in the revised tariff schedule.

21. Board of Foreign Trade, *Classification of Import and Export Commodities of the Republic of China*, 8th ed. (Taipei, December 1968).

22. The import commodity classification and the tariff rates were obtained from the Inspectorate-General of Customs, *Customs Import Tariff of the Republic of China* (Taipei, 1971).

23. "Taiwan: Tobacco and Wine Statistical Year Book, 1969" (Taipei, 1970), which was not publicly circulated.

24. The relevant data are available from the authors.

25. Kuo-shu Liang and Ching-ing Hou Liang, "Exports and Employment in Taiwan," in *Conference on Population and Economic Development in Taiwan* (Taipei: Institute of Economics, Academia Sinica, 1976).

26. Bela Balassa and Associates, *The Structure of Protection in Developing Countries* (Baltimore, Md.: Johns Hopkins University Press), p. 54, table 3.1.

27. Kuo-shu Liang, "Agricultural Trade and Economic Development in Taiwan," *Economic Essays*, vol. 5 (Taipei: National Taiwan University Graduate Institute of Economics, 1974), pp. 207–42.

28. Details are given in Liang and Liang, "Exports and Employment in Taiwan," pp. 238–43, appendix tables 7 and 8.

29. R. M. Stern, *Foreign Trade and Economic Growth in Italy* (New York: Frederick A. Praeger, 1967), pp. 161–63, 33–35.

30. H. B. Chenery, "Patterns of Economic Growth," *American Economic Review*, vol. 50, no. 4 (September 1960), pp. 639–41.

31. Ibid.

32. The value of capital equipment must be several times the value of goods it can produce each year. If imports consist largely of capital goods, total imports may continue to increase even if these capital goods are being used to produce import-substituting commodities.

33. If we include the indirect contribution owing to induced changes in intermediate demand, the contribution of home demand and export expansion during 1966–71 would be 65.6 percent and 36.7 percent, respectively, according to the input-output data. The expansion of exports had significant backward linkages.

34. The capital-labor ratio has been defined as the value of physical capital per worker expressed in New Taiwan dollars. For the industrial sectors, the skilled labor ratio has been derived as the number of skilled workers, technicians, and managerial personnel divided by total employment, while for agriculture it has been derived as the ratio of workers with an educational level of senior high school and higher to total employment. For definitions and basic data, see Liang and Liang, "Exports and Employment in Taiwan."

35. On this point, see Bela Balassa, "A 'Stages' Approach to Comparative Advantage," in Economic Growth and Resources, vol. 4, *National and International Issues*, ed. Irma Adelman (London: Macmillan, 1979), pp. 121–56.

36. H. B. Lary, *Imports of Manufactures from Less Developed Countries* (New York: Columbia University Press, 1968), p. 14.

37. The data used in what follows do not take into account the extent to which labor is drawn from other occupations. In the early part of the period, unemployed labor provided a "reserve army"; subsequently, most of the increment in industrial labor originated in agriculture.

38. Taiwan Provincial Labor Survey and Research Institute, *Quarterly Report on the Labor Force Survey in Taiwan* (Taipei, 1965 and 1976).

39. Directorate-General of Budget, Accounting and Statistics, *Monthly Bulletin of Labor Statistics*, no. 53 (March 1978), table 1-3.

40. Export Processing Zone Administration, *Export Processing Zones Essential Statistics* (December 1976), p. 20.

41. The "critical minimum effort" criterion for successful development was thus satisfied. Cf. J. C. H. Fei and G. Ranis, *Development of the Labor Surplus Economy: Theory and Policy* (Homewood, Ill.: Richard D. Irwin, Inc., 1964), p. 121.

42. S. Jain, *Size Distribution of Income: A Compilation of Data* (Washington, D.C.: World Bank, 1975).

43. Directorate-General of Budget, Accounting and Statistics, *National Income of the Republic of China* (Taipei).

44. I. M. D. Little, "Taiwan's Growth in an International Context," in Galenson, *Economic Development of Taiwan*, p. 500.

45. T. H. Lee, Kuo-shu Liang, Chi Schive, and Rhy-song Yeh, "The Structure of Effective Protection and Subsidy in Taiwan," *Economic Essays*, vol. 6 (November 1975), p. 94.

Appendix
Formulas for Calculating Indicators of Incentives

Notation

Unless otherwise noted, all variables are valued in domestic prices.

Values per unit of output

- P = domestic price
- W = value added in domestic prices (domestic value added)
- V = value added in world market prices (world market value added)
- Q = gross profit in domestic prices
- O = gross profit in world market prices
- B = value of borrowed capital in domestic prices

Nominal protection, taxes, and interest

- T = nominal rate of protection
- T_l = average nominal rate of protection on goods consumed by labor
- T_c = rate of corporate income tax
- i = interest rate

Coefficients

- a_{ji} = input-output coefficient for intermediate products in domestic price
- a_{li} = input-output coefficient for labor in domestic prices
- a_{ni} = input-output coefficient for nontraded goods in domestic prices
- r_{jn} = direct plus indirect input-output coefficient for intermediate inputs used in producing nontraded goods in domestic prices
- r_{wn} = direct plus indirect input-output coefficient for value added embodied in the production of nontraded goods in domestic prices
- r_{ln} = direct plus indirect input-output coefficient for labor used in producing nontraded goods
- r_{kn} = direct plus indirect input-output coefficient for capital used in producing nontraded goods

Superscripts

- w = world market
- d = for domestic use
- x = for exports
- m = for imports
- c = assuming unlimited labor supply
- B = Balassa method of treating nontraded goods
- C = Corden method of treating nontraded goods
- $'$ = adjusted for the difference between actual and free-trade exchange rates
- n = norm

Subscripts

- i = output
- j = input
- m = import
- x = export
- l = labor
- k = capital
- n = nontraded goods

Indicators

- Z = effective rate of protection of value added
- X = bias against exports
- S = effective rate of subsidy to value added
- C = effective rate of protection of cash flow
- H = effective rate of subsidy to cash flow

Price elasticities

- η_x = elasticity of foreign demand for exports
- η_m = elasticity of domestic demand for imports
- ϵ_x = elasticity of domestic supply of exports
- ϵ_f = elasticity of supply of foreign exchange

Trade-related variables

- M = import value (c.i.f.)
- X = export value (f.o.b.)
- R = exchange rate (domestic currency per dollar)

Effective Rates of Protection

On the assumption of constant input coefficients for the total sales of industry i, equation (1) shows the formula for the effective rate of protection, which represents an average of effective rates for domestic and export sales. The numerator of the expression is obtained from domestic input-output statistics; the denominator is derived by deflating domestic values by the nominal rate of protection for the output and tradeable inputs. Nontraded inputs will be introduced later.

$$(1) \qquad Z_i = \frac{W_i}{V_i} - 1 = \frac{P_i - \sum_j a_{ji}P_i}{\frac{P_i}{1+T_i} - \sum_j \frac{a_{ji}P_i}{1+T_j}} - 1$$

Equation (1) can be transformed by normalizing the world market price of the product at unity and deriving input-output coefficients in terms of world market prices. This transformation involves dividing the numerator as well as the denominator of (1) by $P_i/(1 + T_i)$ and using the expression $a_{ji} = a_{ji}{}^w [(1 + T_j)/(1 + T_i)]$. In this way, we obtain equation (2), which is used to estimate effective rates of protection from free-trade (world market) input-output coefficients:

$$(2) \qquad Z_i = \frac{(1+T_i) - \sum_j a_{ji}{}^w (1+T_j)}{1 - \sum_j a_{ji}{}^w} - 1.$$

Assuming that input-output coefficients expressed in world market prices are the same irrespective of whether sales take place in domestic or in export markets, we can now analogously express the effective rate of protection for sales in these markets:

$$(3) \qquad Z_i^d = \frac{W_i^d}{V_i^d} - 1 = \frac{(1 + T_i^d) - \sum_j a_{ji}{}^w (1+T_j^d)}{1 - \sum_j a_{ji}{}^w} - 1$$

$$(4) \qquad Z_i^x = \frac{W_i^x}{V_i^x} - 1 = \frac{(1 + T_i^x) - \sum_j a_{ji}{}^w (1+T_j^x)}{1 - \sum_j a_{ji}{}^w} - 1.$$

The effective rate of protection for industry i will now be the weighted average of effective rates of protection for domestic and for export sales, the weights being world market value added in domestic markets and in export markets. In turn, the nominal rate of protection of the total (domestic *and* export) sales of industry i will be the weighted average of nominal rates on its domestic and export sales, the weights being the world market value of sales in the two markets. Finally, the nominal rate of protection of input j used in industry i will be the weighted average of nominal rates on the inputs used in production for domestic and export markets, the weights being the world market value of input j used in production for the two markets, respectively.

Equations (3) and (4) have been derived under the assumption that there is a single world market price for each product, irrespective of whether sales take place in domestic or in export markets. Under these assumptions, we can derive an indicator of the bias against exports E defined as the ratio of value added in domestic sales to that in foreign sales:

$$(5) \qquad E_i = \frac{(1 + T_i^d) - \sum_j a_{ji}{}^w (1+T_j^d)}{(1 + T_i^x) - \sum_j a_{ji}{}^w (1+T_j^x)} = \frac{Z_i^d + 1}{Z_i^x + 1}.$$

The Treatment of Nontraded Inputs

The treatment of nontraded inputs in estimating the effective rate of protection will be indicated by using equation (1), which has been derived by taking domestic input-output coefficients as the point of departure.

In deriving the Corden measure for treating nontraded inputs, the direct and indirect contributions of primary factors are summed through the various stages of producing a nontraded good; that is, one goes down the input-output structure until a traded input is reached. This procedure entails dividing the value of nontraded inputs into two parts: (1) direct and indirect material inputs, which are combined with the value of material inputs used in the production process; and (2) direct and indirect value added, which are combined with value added in processing. Tariffs on material inputs used in producing nontraded goods are thus assumed to increase the cost of these inputs to the producer. The Balassa method, too, assumes the forward shifting of such tariffs, since it takes the effective rate of protection of nontraded goods to be zero.

The input-output coefficients for nontraded goods, a_{ni}, are divided into two parts: the cumulated value of material inputs and value added in the production of nontraded goods and their nontraded inputs. This division is effected by using a semi-input-output method that uses elements of the matrix of direct and indirect material inputs and value added coefficients for nontraded inputs (denoted by r_{jn} and r_{wn}, respectively) without further partitioning the material inputs used in producing nontraded goods. The effective rates of protection under the Balassa (B) and Corden (C) methods are estimated from domestic input-output coefficients by using equations (6) to (10):

$$(6) \qquad W_i^B = P_i - \sum_j a_{ji}P_i - \sum_n a_{ni}P_i$$

$$(7) \qquad W_i^C = P_i - \sum_j a_{ji}P_i - \sum_j \sum_n a_{ni}P_i r_{jn}$$
$$= W_i^B + \sum_w \sum_n a_{ni}P_i r_{wn}$$

where $r_{jn} + r_{wn} = 1$

$$(8) \qquad V_i^B = \frac{P_i}{1+T_i} - \sum_j \frac{a_{ji}P_i}{1+T_j} - \sum_j \sum_n \frac{a_{ni}P_i r_{jn}}{1+T_j}$$
$$- \sum_w \sum_n a_{ni}P_i r_{wn}'$$

$$(9) \qquad V_i^C = \frac{P_i}{1+T_i} - \sum_j \frac{a_{ji}P_i}{1+T_j} - \sum_j \sum_n \frac{a_{ni}P_i r_{jn}}{1+T_j}$$
$$= V_i^B + \sum_w \sum_n a_{ni}P_i r_{wn}$$

$$(10a) \qquad Z_i^B = \frac{W_i^B}{V_i^B} - 1 = \frac{W_i^B - V_i^B}{V_i^B}$$

$$(10b) \qquad Z_i^C = \frac{W_i^C}{V_i^C} - 1 = \frac{W_i^C - V_i^C}{V_i^C}$$
$$= \frac{W_i^B - V_i^B}{V_i^B + \sum_w \sum_n a_{ni}P_i r_{wn}}.$$

Thus the formulas used for estimating the effective rate of protection under the Corden and the Balassa methods differ in that the former includes, and the latter excludes, in the denominator of the equation, the term

$$\Sigma_w \Sigma_n a_{ni} P_i r_{wn}$$

(the cumulated value added elements of nontraded inputs). Since this term is always positive, the Corden formula will give a smaller or greater result than the Balassa method, depending on whether the effective rate of protection is positive or negative. In practice, an approximation can be used instead of the (partial) inversion of the input-output matrix, because it will rarely be necessary to go back more than two steps in calculating value added and the material content of nontraded goods since the additional adjustments become increasingly smaller.

Calculation of "Net" Effective Rates

Net effective rates are calculated by adjusting effective rates estimated at the actual exchange rate for the extent of overvaluation in relation to the hypothetical free-trade situation'. The relevant formulas are derived from (11a) and (11b):

$$(11a) \qquad P_i = \pi_i R(1 + T_i)$$

$$(11b) \qquad P_i' = \pi_i R'.$$

These equations express the domestic prices of a particular commodity under protection and under free trade in terms of world market prices, exchange rates, and tariffs. P denotes the domestic price expressed in the domestic currency; π is the world market price expressed in foreign currency, and R the exchange rate. Unprimed magnitudes refer to the situation under protection, and primed magnitudes pertain to free-trade values. The world market price of the commodity in question is taken to be unaffected by the imposition of protective measures.

The net nominal rate of protection T', which indicates the percentage excess of the domestic price under protection over that under free trade, can now be expressed as:

$$(12) \qquad T_i' = \frac{P}{P'} - 1 = (1 + T_i)\frac{R}{R'} - 1.$$

The same formula is used in adjusting effective rates of protection as long as the Corden method is applied, for this method combines value added in producing nontraded inputs with value added in processing. The use of the Balassa method, however, will require adjusting the nominal rates of protection in (11a) by the extent of overvaluation in relation to the free-trade situation.

It will be recalled that effective rates of protection are estimated under the assumption that world market prices are constant, that is, that foreign demand elasticities are infinite. While it may be realistic to assume that the imports of developing countries are supplied at constant costs, world demand for their exports may not be infinitely elastic. To the extent that it is not, the degree of discrimination against export industries will be overstated: the lower the elasticity of foreign demand for a country's exports, the less will the overvaluation of the exchange rate associated with protection reduce the domestic prices of these exports.

Less than infinite elasticities of export demand thus call for an additional adjustment in the estimates of effective protection for export industries. Because of the possibilities for error associated with the assumed values of the relevant elasticities for particular products, such adjustments have not been made in the present investigation.

Estimation of the Extent of Overvaluation

Logically, the estimation of the extent of overvaluation in relation to the free-trade situation proceeds in two stages. First, we estimate the decrease in exports and the increase in imports that would result from the elimina-

tion of protective measures; second, we calculate the extent of the devaluation that would be necessary to remedy the ensuing deficit in the balance of payments. In actual estimation, we take account of the simultaneity of changes in tariffs, export subsidies, and the exchange rate. The condition for balance of payments equilibrium after the elimination of tariffs and subsidies and the compensating devaluation is indicated by (13).[1] From (13), we can express the ratio R'/R as in (14) for estimating net effective rates of protection:

$$(13) \qquad \epsilon_f \left[\frac{R'}{R(1+T_x)} - 1\right] X - \eta_m \left[\frac{R'}{R(1+T_m)} - 1\right] M = 0$$

where $\epsilon_f = \dfrac{\epsilon_x(\eta_x - 1)}{\epsilon_x + \eta_x}$

$$(14) \qquad \frac{R'}{R} = \frac{\epsilon_f X_i + \eta_m M_i}{\dfrac{\epsilon_f X_i}{1+T_x} + \dfrac{\eta_m M_i}{1+T_m}}.$$

As indicated by (13), the extent of overvaluation as compared with the free-trade situation depends on the initial values of exports X and imports M, the nominal rates of protection of exports T_x and imports T_m, the price elasticity of import demand η_m, and the elasticity of supply of foreign exchange ϵ_f. The latter will depend on the foreign demand elasticity for the country's exports η_x and on the domestic supply elasticity of these exports ϵ_x; the foreign elasticity of supply of imports is taken to be infinite.

It is easy to see that in the usual case when the rate of tariff exceeds the rate of export subsidy, the extent of overvaluation will be smaller than the former rate and greater than the latter. Correspondingly, in (13) the term in the first brackets will be positive and the term in the second brackets negative; that is, both exports and imports would rise after the elimination of tariffs and subsidies accompanied by the devaluation necessary to reestablish equilibrium in the balance of payments. It is further apparent that if the rate of tariff exceeds the rate of export subsidy, the extent of overvaluation will be positively correlated with the elasticity of import demand and negatively with the elasticity of supply of foreign exchange. The latter, in turn, is positively related to the elasticities of demand for, and supply of, exports. The extent of overvaluation is independent of the values taken by the elasticities only if average rates of tariffs and export subsidies are identical, and it will then be equal to these rates.

For simplicity's sake, equations (13) and (14) have been formulated with regard to total exports and imports; they can be reinterpreted, however, as the summation of values for individual products and product groups. Also, we have assumed that the country's balance of payments is initially in equilibrium, in the sense that given the protective measures actually applied, there is no unplanned reserve loss or temporary short-term capital movements. Should this not be the case, equations (13) and (14) would need to be modified as indicated in *The Structure of Protection in Developing Countries*, appendix A. Such adjustments have not been necessary, however, in the case studies reported in Part II of this volume.

Calculation of the Effective Rate of Subsidy

Effective rates of subsidy are calculated by adjusting the equations used in estimating effective rates of protection for credit and tax preferences. Now, the superscript n refers to the norm that has been usually defined as the weighted average of the relevant variables. Thus, in the numerator of equations (15) and (16), the second term refers to the value of tax preferences (differential rates of corporate income tax) and the third to that of interest preferences (differential interest rates). The two equations show the effective rate of subsidy using the Corden and the Balassa conventions for traded and nontraded inputs, respectively:

$$(15) \qquad S_i^C = \frac{W_i^C + (T_c^n - T_c)Q_i + (i^n - i)B_i}{V_i^C} - 1$$

$$= \frac{P_i - \sum_j a_{ji}P_i - \sum_j \sum_n a_{ni}P_i r_{jn} + (T_c^n - T_c)Q_i + (i^n - 1)B_i}{\dfrac{P_i}{1+T_i} - \sum_j \dfrac{a_{ji}P_i}{1+T_j} - \sum_j \sum_n \dfrac{a_{ni}P_i r_{jn}}{1+T_j}} - 1$$

where $Q_i = P_i - \sum_j a_{ji}P_i - \sum_n a_{ni}P_i - a_{li}P_i - iB_i.$

$$(16) \qquad S_i^B = \frac{\left[P_i - \sum_j a_{ji}P_i - \sum_n a_{ni}P_i\right] + (T_c^n - T_c)Q_i + (i^n - i)B_i}{\left[\dfrac{P_i}{1+T_i} - \sum_j \dfrac{a_{ji}P_i}{1+T_j} - \sum_j \sum_n \dfrac{a_{ni}{}^n P_i r_{jn}}{1+T_j} - \sum_w \sum_n a_{ni}{}^n P_i r_{wn}\right]} - 1.$$

1. The derivation of the formula is provided in B. Balassa and Associates, *Structure of Protection in Developing Countries* (Baltimore, Md.: Johns Hopkins University Press, 1971), app. A.

Cash Flow Measure

The effective rates of protection and subsidy can be transformed into cash flow measures C_i and H_i, in which observed cash flow is related to its market value. This is shown in equations (17) and (18), respectively, which use the Balassa convention of treating nontraded inputs. In the equations, a_{li} refers to labor input-output coefficients, T_l is the average rate of nominal protection on goods consumed by labor, and r_{ln} and r_{kl}, respectively, refer to the matrix of direct plus indirect input-output coefficients for labor and capital used in producing nontraded goods.

$$(17) \qquad C_i = \frac{Q_i}{O_i} - 1 = \frac{P_i - \sum_j a_{ji} - \sum_n a_{ni}P_i - a_{li}P_i - iB_i}{\frac{P_i}{1+T_i} - \sum_j \frac{a_{ji}P_i}{1+T_j} - \sum_j \sum_n \frac{a_{ni}P_i r_{jn}}{1+T_j} - \sum_l \sum_n \frac{a_{ni}P_i r_{ln}}{1+T_l} - \frac{a_{li}P_i}{1+T_l} - iB_i - \sum_k \sum_n a_{ni}P_i r_{kn}} - 1$$

where $r_{jn} + r_{ln} + r_{kn} = 1$

$$(18) \qquad H_i = \frac{Q_i + (T_c^n - T_c)Q_i + (i^n - i)B_i}{\frac{P_i}{1+T_i} - \sum_j \frac{a_{ji}P_i}{1+T_j} - \sum_j \sum_n \frac{a_{ni}P_i r_{jn}}{1+T_j} - \sum_l \sum_n \frac{a_{ni}P_i r_{ln}}{1+T_i} - \frac{a_{li}P_i}{1+T_i} - iB_i - \sum_k \sum_n a_{ni}P_i r_{kn}} - 1.$$

Appendix Table 3.1. *Eleven Semi-industrial Economies: Exports and Imports and the Manufacturing Sector*
(million U.S. dollars)

	Argentina	Brazil	Chile	Colombia	India	Israel	Korea	Mexico	Singapore	Taiwan	Yugoslavia
A. Export Values											
1953											
Primary	1022	1524	385	589	567	38	38	517	n.a.	122	143
Traditional	863	1269	295	568	355	36	25	386	n.a.	112	80
Nontraditional	159	255	90	21	212	2	13	131	n.a.	10	63
Manufactured	103	15	25	7	549	22	2	68	n.a.	6	43
Total	1125	1539	410	596	1116	60	40	585	n.a.	128	186
1960											
Primary	1036	1240	459	458	731	142	27	663	48	112	326
Traditional	908	870	399	412	421	106	8	378	-	89	103
Nontraditional	128	370	60	46	310	36	19	285	48	23	223
Manufactured	43	29	31	7	600	69	5	100	23	37	240
Total	1079	1269	490	465	1331	211	32	763	71	149	566
1966											
Primary	1495	1616	801	466	954	343	99	994	230	292	455
Traditional	1341	982	687	401	429	247	33	474	-	141	199
Nontraditional	154	634	114	65	525	96	66	520	230	151	256
Manufactured	98	125	74	42	882	160	151	205	85	243	765
Total	1593	1741	875	508	1836	503	250	1199	315	535	1220
1973											
Primary	2530	4970	1157	947	1482	1014	514	1330	799	875	989
Traditional	2141	1632	974	625	434	727	98	534	-	153	455
Nontraditional	389	3338	183	322	1048	287	416	796	799	722	534
Manufactured	736	1229	74	228	1469	495	2711	740	1001	3606	2031
Total	3266	6199	1231	1175	2961	1509	3225	2070	1800	4481	3020
B. Manufacturing Sector (1973)											
Output	20706	27851	3002	3041	16893	3504	6687	16781	2350	7225	12024
Less Exports	736	1229	74	228	1469	495	2711	740	1001	3606	2031
Plus Imports	1147	4107	622	772	1622	1691	2364	2872	2439	2306	3173
Utilization	21117	31629	3550	3585	17046	4700	6340	18913	3788	5925	13166

Note: The dollar values of manufactured output have been derived by adjusting data expressed in national currencies by the exchange rates shown in the World Bank, World Tables, 1976. An exception has been made for Korea, where the 1960 official exchange rate was adjusted for the devaluation undertaken in early 1961 and for wholesale price changes.

To make up for the lack of data on manufactured output for 1960, values have been derived from the 1966 data by using growth rates of value added in manufacturing, and inflation in the prices of manufactured goods, for the period 1960-66. The same method has been applied in cases where 1973 manufactured output figures are not available.

Sources: Exports: national and international trade statistics.
Manufactured output: United Nations, The Growth of World Industry, various issues, and national statistics.

Appendix Table 3.2. *Eleven Semi-industrial Economies: Traditional Exports*

SITC Code	Commodity		1953 Exports	1953 As Percentage of Total Exports	1960 Exports	1960 As Percentage of Total Exports	1966 Exports	1966 As Percentage of Total Exports	1973 Exports	1973 As Percentage of Total Exports
ARGENTINA										
011	Meat, chilled and frozen	V	76.6	6.8	158.2	14.7	307.7	19.3	639.9	19.6
		Q	0.18	18.0	0.37	16.6	0.56	15.9	0.43	7.8
013	Meat, canned or prepared	V	124.9	11.1	61.8	5.7	85.3	5.4	149.1	4.6
		Q	0.06	15.6	0.06	12.4	0.07	10.8	0.07	7.9
041	Wheat, unmilled	V	190.6	16.9	142.7	13.2	279.6	17.5	273.8	8.4
		Q	2.53	9.9	2.49	9.0	5.05	9.0	2.97	3.9
044	Maize, unmilled	V	58.9	5.2	124.2	11.5	200.7	12.6	365.3	11.2
		Q	1.08	21.1	2.57	22.0	3.76	14.8	4.03	8.4
045	Other cereals, unmilled	V	22.5	2.0	34.2	3.2	51.4	3.2	200.5	6.1
		Q	1.12	12.9	0.79	14.6	0.23	2.7	0.46	2.9
051	Fruits and nuts, fresh	V	53.0	4.7	24.9	2.3	39.3	2.5	50.1	1.5
		Q	0.09	1.1	0.20	2.0	0.24	2.0	0.13	0.8
081	Animal feeding stuff	V	62.4	5.5	73.7	6.8	97.6	6.1	165.5	5.0
		Q	0.71	26.8	0.78	18.0	0.78	8.9	0.73	5.1
211	Hides, skins, and furs, undressed	V	60.6	5.4	70.0	6.5	75.2	4.7	23.3	0.7
		Q	0.15	28.1	0.14	18.4	0.18	17.3	0.03	2.6
262	Wool and animal hair	V	179.0	15.9	146.2	13.5	132.9	8.3	188.2	5.8
		Q	0.10	8.1	0.11	8.5	0.11	9.0	0.05	4.5
4221	Linseed oil	V	34.7	3.1	72.5	6.3	71.1	4.5	85.5	2.6
		Q	0.11	44.0	0.17	68.0	0.12	42.8	0.10	35.7
	Total	V	863.2	76.7	908.4	84.2	1,340.8	84.2	2,141.2	65.6
		Q	0.78	15.2	0.95	18.4	1.85	13.4	1.31	7.3
BRAZIL										
0711	Coffee, green, roasted	V	1042.1	67.7	712.7	56.2	764.0	43.9	1244.3	20.1
		Q	0.93	44.5	1.01	38.5	1.01	32.7	1.07	28.2
0721	Cocoa beans, raw, roasted	V	73.6	4.8	69.2	5.4	50.7	2.9	88.5	14.3
		Q	0.11	14.5	0.13	14.4	0.11	10.0	0.08	7.1
2432	Wood, shaped, coniferous (million cubic meters)	V	45.5	2.9	42.7	3.4	56.2	3.2	80.7	1.3
		Q	0.48	1.1	0.56	0.08	0.78	0.07	0.75	0.0
2631	Raw cotton	V	107.5	7.0	45.6	3.6	111.0	6.4	218.1	3.5
		Q	0.14	5.5	0.09	2.5	0.24	6.3	0.28	6.4
	Total	V	1,268.7	82.4	870.2	68.6	981.9	56.4	1,631.6	26.3
		Q	0.80	37.9	0.87	32.8	0.86	26.7	0.89	22.7

(Table continues on the following page.)

Apoendix Table 3.2 (continued)

SITC Code	Commodity		1953 Exports	1953 As Percentage of Total Exports	1960 Exports	1960 As Percentage of Total Exports	1966 Exports	1966 As Percentage of Total Exports	1973 Exports	1973 As Percentage of Total Exports
CHILE										
281	Iron ore & concentrates	V	12.8	3.1	35.2	7.2	78.0	8.9	55.6	4.5
		Q	2.44	3.7	5.19	3.7	10.31	4.7	8.12	2.4
2712	Natural sodium nitrate (saltpetre)	V	54.4	13.3	25.9	5.3	24.2	2.8	16.9	1.4
		Q	n.a.		n.a.		n.a.		n.a.	
68211	Copper, unrefined	V	228.7	55.8	337.5	65.4	584.6	66.8	901.6	73.2
68212	and refined	Q	0.29	19.3	0.27	33.7	0.23	30.3	0.16	21.0
	Total	V	295.9	72.2	398.6	81.3	686.8	78.4	974.1	79.1
		Q	0.40	18.5	0.73	30.9	1.42	27.3	0.62	19.9
COLOMBIA										
0711	Coffee, green, roasted	V	492.2	82.6	332.2	71.4	328.3	64.6	597.9	50.9
		Q	0.30	14.4	0.36	13.7	0.33	10.7	0.40	10.5
331	Crude petroleum	V	76.3	12.8	80.0	17.2	71.7	14.1	26.8	2.3
		Q	4.61	2.3	4.35	1.1	4.89	0.7	1.34	0.1
332	Petroleum products	V	0.3	0.0	7.8	1.7	9.7	1.9	34.0	2.9
		Q	1.3	0.0	602.8	0.3	918.9	0.3	1900.0	0.5
	Total	V	568.8	95.4	420.0	90.3	410.7	80.7	658.7	56.1
		Q	0.88	12.8	12.31	11.1	22.82	8.7	98.48	9.6
INDIA										
0741	Tea	V	218.7	19.4	260.0	19.5	252.2	13.7	186.3	6.3
		Q	0.24	49.0	0.19	37.2	0.18	30.0	0.19	24.0
ex-075	Pepper	V	28.1	2.5	17.9	1.4	24.2	1.3	29.9	1.0
		Q	0.01	17.3	0.02	16.2	0.03	22.4	0.03	14.7
121	Tobacco, unmanufactured	V	23.7	2.1	30.7	2.3	34.3	1.9	80.8	2.7
		Q	0.03	4.9	0.04	5.4	0.04	3.7	0.08	6.8
2837	Manganese ore and concentrates	V	52.2	4.6	29.5	2.2	22.9	1.2	10.3	0.3
		Q	1.00	20.8	1.17	21.7	1.19	16.5	0.69	8.3
	Total	V	322.7	28.6	366.7	25.4	333.6	18.1	307.3	10.3
		Q	0.33	38.4	0.23	29.4	0.22	25.8	0.16	18.0

(Table continues on the following page.)

Appendix Table 3.2 (continued)

SITC Code	Commodity		1953 Exports	1953 As Percentage of Total Exports	1960 Exports	1960 As Percentage of Total Exports	1966 Exports	1966 As Percentage of Total Exports	1973 Exports	1973 As Percentage of Total Exports
ISRAEL										
0511	Citrus fruit	V	22.5	37.5	45.2	49.9	57.6	11.4	110.0	7.3
& 0512		Q	0.21	7.6	0.40	11.8	0.57	12.4	0.80	12.7
6672	Diamonds, non-industrial, unset	V	13.3	22.2	60.9	28.9	189.5	37.6	617.1	40.1
		Q	n.a.		n.a.		n.a.		n.a.	
	Total	V	35.8	59.7	106.0	50.2	247.1	49.1	727.1	47.4
		Q	0.21	7.6	0.40	11.8	0.57	12.4	0.80	12.7
KOREA										
ex-0548	Edible vegetables n.e.s. (seaweed)	V	0.8	2.0	1.3	4.0	8.7	3.5	7.6	0.2
		Q	n.a.		n.a.		n.a.		n.a.	
2613	Raw silk	V	6.3	15.7	1.0	3.0	11.6	4.6	72.8	2.3
		Q	0.20	3.1	0.12	2.0	1.07	7.3	2.66	10.4
2839	Tungsten ores & concentrates	V	15.8	39.5	4.7	14.2	9.5	3.8	10.3	0.3
		Q	26.93	55.0	4.00	24.4	3.76	32.7	4.37	26.8
2924	Vegetables used in pharmacy (ginseng)	V	2.3	5.8	0.9	2.7	2.9	1.2	7.2	0.2
		Q	n.a.		n.a.		n.a.		n.a.	
	Total	V	25.0	63.0	7.9	23.9	32.8	13.1	97.9	3.0
		Q	19.50	40.2	3.31	20.5	2.28	18.7	2.87	12.4
MEXICO										
0313	Shellfish	V	13.8	2.6	34.82	4.6	55.0	4.6	105.0	5.1
		Q	0.02	12.7	0.05	16.0	0.03	11.2	0.04	6.6
0711	Coffee, green, roasted	V	72.1	12.3	71.9	9.4	86.1	7.2	167.7	8.1
		Q	0.07	3.3	0.08	3.1	0.10	3.2	0.14	3.7
2631	Raw Cotton	V	140.4	24.0	157.9	20.7	221.9	18.5	166.0	8.0
		Q	0.23	9.4	0.32	9.4	0.43	11.0	0.18	3.8
2835	Zinc ores	V	9.0	2.0	6.9	1.0	37.0	3.2	23.9	1.1
		Q	0.30	30.3	0.38	20.9	0.31	15.2	0.24	8.7
6811	Silver, unworked or partly worked	V	27.4	4.7	24.5	3.2	35.4	2.9	19.80	0.8
		Q	n.a.		n.a.		n.a.		n.a.	
6821	Copper, unwrought	V	36.0	6.1	24.9	3.3	7.6	0.6	31.8	1.5
		Q	0.05	3.3	0.03	3.7	0.01	1.3	0.02	2.0
6851	Lead, unwrought	V	56.7	9.7	31.0	4.1	27.6	2.3	22.8	1.1
		Q	0.05	7.7	0.13	14.6	0.11	13.0	0.06	5.5
	Total	V	354.4	61.4	351.9	46.3	470.6	39.3	537.0	25.7
		Q	0.13	7.2	0.19	8.4	0.26	9.1	0.13	5.6

(Table continues on the following page.)

Appendix Table 3.2 (continued)

SITC Code	Commodity		1953 Exports	1953 As Percentage of Total Exports	1960 Exports	1960 As Percentage of Total Exports	1966 Exports	1966 As Percentage of Total Exports	1973 Exports	1973 As Percentage of Total Exports
TAIWAN										
042	Rice	V	13.4	10.5	5.1	3.4	29.7	5.6	14.4	0.3
		Q	0.06	1.4	0.04	0.7	0.18	2.5	0.26	2.8
051	Bananas	V	3.1	2.4	6.1	4.1	48.4	9.0	29.3	0.7
		Q	0.02	0.7	0.05	1.3	0.37	7.2	0.23	3.4
061	Sugar & honey	V	85.8	67.5	72.2	48.5	52.7	9.9	90.2	1.9
		Q	0.88	6.5	0.92	5.6	0.85	4.5	0.45	2.0
0741	Tea	V	6.8	5.3	6.1	4.1	9.9	1.8	19.4	0.4
		Q	0.01	2.0	0.01	2.0	0.02	3.3	0.02	2.5
	Total	V	109.1	85.8	89.4	60.1	140.8	26.3	153.2	3.4
		Q	0.70	5.4	0.75	4.8	0.49	4.9	0.34	2.4
YUGOSLAVIA										
011	Meat, fresh, etc.	V	8.2	4.4	28.3	5.0	105.4	8.6	170.9	5.7
		Q	0.02	0.2	0.05	2.2	0.10	2.8	0.07	1.2
121	Tobacco, unmanufactured	V	5.6	3.0	19.8	3.5	32.2	2.6	32.5	1.1
		Q	0.01	1.6	0.02	2.6	0.02	2.1	0.02	1.6
243	Wood, shaped	V	40.6	21.8	41.2	7.3	45.2	3.7	140.7	4.6
	(million cubic meters)	Q	0.60	1.4	0.63	0.9	1.05	1.0	0.91	0.6
6821	Copper, unwrought	V	10.0	5.4	0.0	0.0	0.1	0.0	94.2	3.1
		Q	0.01	0.7	0.0	0.0	0.0	0.0	0.08	1.1
6851	Lead, unwrought	V	15.4	8.3	13.8	2.4	16.7	1.4	16.5	0.5
		Q	0.06	7.7	0.07	7.9	0.06	6.0	0.04	3.7
	Total	V	79.8	42.9	103.1	18.2	199.5	16.4	454.3	15.0
		Q	0.32	2.4	0.28	2.5	0.28	2.5	0.33	1.7

Note: The quantity figures shown in the "Total" rows indicate the value-weighted averages of the quantities exported of commodities for which quantity data are available. The quantity percentages in the "Total" rows show the economy's average share in the volume of world exports of the commodities in question. In the case of Brazil and Yugoslavia, wood had to be excluded from the calculations as it is measured in different units from other commodities. V = value in millions of U.S. dollars; Q = quantities in metric tons, unless otherwise noted.

Source: As in Appendix Table 3.1.

Appendix Table 5.1. *Argentina: Protection Rates, by Three-digit Sector, 1969*
(percent)

Sector	Nominal Protection			Effective Protection				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Primary Activities																	
011	-10	-10	-10	-13	-13	-13	-13	-60	-60	-60	-12	-11	-11	-11	-59	-59	-59
Processed Foods																	
201	-9	-7	-8	-26	-6	-17	-14	-149	-109	-132	-22	-11	-17	-13	-142	-119	-132
202	-2	0	0	0	6	6	6	-51	-45	-45	0	5	5	5	-51	-46	-46
203	8	6	6	-4	-8	-8	-7	-54	-58	-57	5	-10	-10	-8	-45	-59	-58
204	3	0	0	7	-2	-1	-1	-52	-61	-60	14	-3	-2	-1	-43	-63	-61
205	-10	-8	-8	-36	-18	-20	-14	-134	-106	-110	-30	-18	-20	-14	-125	-107	-101
206	12	0	0	9	-23	-23	-20	-57	-96	-96	28	-23	-23	-20	-33	-96	-96
207	12	87	83	-41	-260	-247	-394	-51*	-113*	-109*	-62	-258	-247	-333	-57*	-113*	-101*
208	12	30	30	-4	27	27	24	-63	-24	-24	7	26	26	23	-48	-26	-26
209	-9	14	6	-54	138	72	49	-648	861	341	-46	132	71	49	-513	696	280
312	-16	-16	-16	-29	-28	-30	-22	-92	-91	-93	-27	-19	-30	-22	-89	-81	-93
Beverages & Tobacco																	
211	12	52	52	-67	22	22	17	-125	-36	-36	-52	22	22	17	-109	-37	-37
212	12	50	50	37	226	226	184	2	454	454	69	224	224	182	77	428	428
213	12	50	50	-3	119	119	72	-98	175	175	18	119	119	71	-49	168	168
214	12	50	50	-17	47	47	40	-63	-14	-14	-6	46	46	39	-54	-15	-15
220	-10	58	49	-448	192	139	111	-637	172	106	-445	191	188	111	-631	170	109
Mining & Energy																	
110	0	30	30	-8	25	25	25	42*	-14*	-14*	-9	24	24	24	44*	-14*	-14*
121	0	72	51	-17	86	56	47	-136	86	21	-17	87	57	48	-138	93	25
122	0	70	51	-10	72	50	47	-61	3	-15	-9	75	52	49	-60	5	-13
130	0	33	33	-5	39	39	31	-54	-24	-24	-5	39	39	31	-54	-24	-24
140	0	0	0	-12	-12	-12	-9	-65	-65	-65	-12	-12	-12	-9	-65	-65	-65
191	0	0	0	-23	-23	-23	-18	-94	-95	-94	-23	-23	-23	-18	-95	-95	-95
192	0	63	63	-32	81	81	56	238*	-224*	-224*	-19	76	76	52	277*	-221*	-221*
199	0	71	31	-19	75	22	18	-208	128	-62	-13	65	21	17	-201	117	-62

(Table continues on the following page.)

Appendix Table 5.1 (continued)

Sector	Nominal Protection			Effective Protection				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Construction Materials																	
331	12	63	63	6	83	83	71	-57	46	46	15	81	81	69	-46	39	39
334	12	15	15	-1	4	4	3	-53	-49	-49	8	2	2	2	-45	-50	-50
339	12	28	28	4	35	35	29	-56	-23	-23	16	34	34	28	-42	-25	-25
Intermediate Products I																	
231	-5	66	63	-214	878	832	370	31	-244	-233	-174	872	828	368	22	-246	-234
233	12	41	41	-21	58	58	49	-110	16	16	2	58	58	48	-72	14	14
251	12	76	76	238	1,308	1,308	391	-51	-143	-143	336	1,285	1,285	384	-60	-144	-144
291	-12	65	-3	-27	221	2	2	-92	184	-59	-22	184	2	2	-86	143	-59
292	-2	-3	-3	-2	-3	-3	-3	-55	-56	-56	4	-4	-2	-3	-49	-57	-56
299	12	12	12	4	5	5	4	-67	-67	-67	23	-1	5	4	-39	-76	-67
321	12	37	37	-353	48	48	36	-381	-11	-11	-325	47	47	36	-353	-12	-12
329	12	77	77	260	-264	-264	1,081	60*	-147*	-147*	208	-264	-264	-1,079	40*	-147*	-147*
332	12	63	63	-14	82	82	67	-111	72	72	-3	80	80	66	-86	63	63
341	26	62	61	14	106	103	87	-39	32	30	36	104	102	87	-22	30	29
342	12	41	41	-33	38	37	29	-82	-21	-22	-10	37	36	29	-61	-22	-23
Intermediate Products II																	
231	-5	45	43	-111	62	54	47	-188	7	-2	-103	61	53	47	-177	6	-3
239	12	51	49	-28	92	85	61	-213	160	140	-2	89	85	61	-129	150	135
251	12	87	87	-95	12	12	11	-8	-26	-26	-84	13	13	11	-9	-25	-25
252	12	95	95	-68	170	170	123	69*	-183*	-133*	-51	167	167	121	59*	-188*	188*
259	12	70	70	-68	158	158	110	25*	-91*	-91*	-40	159	159	111	10*	-91*	-91*
271	12	56	56	-22	114	114	80	-141	171	171	-3	112	112	78	-92	148	148
272	12	82	82	-94	70	70	57	-224	38	38	-79	69	69	55	-194	32	32
279	12	83	83	-83	193	193	127	570	-937	-937	-59	190	190	125	636	-1,278	-1,278
300	12	104	104	-264	384	384	243	748	-993	-993	-260	349	349	221	1,015	1,015	1,015
309	12	109	109	70	-544	-544	3,679	-23*	-140	-140	47	-523	-523	3532	-25*	-143*	-143*
311	-5	88	77	-172	160	123	82	-402	212	144	-163	158	122	81	-379	203	139
313	12	75	75	-126	179	179	94	8244	-7934	-7934	-91	178	178	94	20829	-25574	-25574
319	11	67	65	-49	202	193	99	294	-743	-705	-17	200	192	99	171	-774	-740
341	26	55	54	8	102	100	77	-53	63	60	20	101	99	76	-39	60	58
342	12	72	72	-68	109	179	146	-222	279	274	-29	179	177	145	-138	267	263
350	14	75	75	-2	137	137	112	-108	228	227	14	137	137	112	-69	222	222
379	12	78	75	0	147	141	112	22*	-235*	-224*	14	145	139	111	-1*	-240*	-230*

(Table continues on the following page.)

Appendix Table 5.1 (continued)

Sector	Nominal Protection			Effective Protection				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Nondurable Consumer Goods																	
232	12	40	90	-45	92	92	80	-100	34	34	-31	91	91	80	-85	32	32
241	12	76	78	-15	147	147	121	-143	265	265	2	146	146	121	-97	255	255
242	12	76	76	4	117	117	100	-57	68	68	17	116	116	99	-43	66	66
243	12	57	56	-51	35	35	32	-95	-25	-25	-38	35	34	31	-83	-25	-26
244	12	69	69	-191	18	17	14	-269	-42	-44	-164	18	16	13	-240	-43	-44
249	12	62	62	-19	48	48	48	-68	-14	-14	-10	48	48	47	-60	-15	-15
280	12	16	16	-6	-1	-1	-1	-62	-58	-58	-3	-2	-2	-2	-54	-59	-59
293	12	12	12	9	8	8	7	-70	-71	-71	25	4	8	7	-40	-79	-71
333	12	33	33	17	51	51	42	-46	2	2	27	50	50	41	-32	-1	-1
391	17	95	97	9	175	159	122	-60	119	102	23	171	157	122	-45	109	94
392	9	51	45	-9	60	50	44	-61	6	-3	-1	62	53	45	-53	10	1
394	12	122	122	68	-596	-596	-3275	-25*	-137*	-137*	24	-601	-601	-3303	-33*	-136*	-136*
395	12	55	55	-10	132	132	68	-116	269	269	17	135	135	70	-39	344	343
399	12	120	119	-199	381	381	192	89*	-226*	-225*	-154	386	386	195	58*	-219*	-218*
Consumer Durables																	
260	12	41	41	-16	43	43	36	-104	-7	-7	-3	42	42	35	-81	-10	-10
370	12	162	161	-176	472	468	287	39*	-183*	-181*	-168	467	463	284	39*	-185*	-184*
385	12	127	127	-74	307	307	217	7*	-121*	-121*	-43	307	307	217	-3*	-121*	-121*
393	12	115	93	-33	173	129	106	-474	1106	768	-16	171	131	108	-534	1860	1347
Machinery																	
360	15	88	86	-1	109	105	97	-51	28	25	20	107	104	96	-35	27	25
369	12	96	81	-12	174	140	108	-137	321	238	19	166	140	108	-58	302	237
370	12	96	95	-33	197	196	156	67*	-307*	-305*	-21	194	193	154	-56*	-323*	-321*
Transport Equipment																	
381	12	103	103	-5	146	146	126	38*	-244*	-244*	10	145	145	125	11*	-247*	-247*
382	12	84	84	5	104	104	94	-203	495	495	18	103	103	93	-108	442	442
383	12	112	112	-182	299	299	179	297*	-451*	-451*	-139	297	297	177	247*	-473*	-473*
384	12	148	148	-73	316	316	203	23*	-172*	-172*	-47	315	315	202	10*	-172*	-172*
386	12	44	44	1	43	43	40	-102	1	1	13	43	43	39	-72	-1	-1
389	12	93	93	-12	141	141	125	-6*	-99*	-99*	4	140	140	124	-15*	-99*	-99*

*Sectors with negative cash flow at world prices.

(Table continues on the following page.)

Appendix Table 5.1 (continued)

Key to Sectors

011 Farming and stockraising
110 Coal mining
121 Extraction of iron ore
122 Extraction of metals other than iron ore
130 Crude oil and natural gas
140 Extraction of stone, clay, and sand
191 Salt mining and quarrying
192 Extraction of ores for fertilizer and chemical products
199 Extraction of nonmetal ores not elsewhere classified
201 Slaughtering of livestock; meat preparation and processing
202 Manufacture of dairy products
203 Packing and processing of fruits and vegetables
204 Packing and processing of fish and other marine products
205 Manufacture of milled products
206 Manufacture of baked products
207 Sugar mills and refineries
208 Treatment of cocoa, chocolate, and candies
209 Miscellaneous food industries
211 Distillation, rectification, and blending of spirituous beverages
212 Wine making
213 Manufacture of beer and malt
214 Manufacture of nonalcoholic beverages and aerated waters
220 Tobacco industry
231 Spinning, weaving, and finishing of textiles
232 Manufacture of knitted fabrics
233 Manufacture of cord, rope, and cordage
239 Manufacture of textiles not elsewhere classified
241 Manufacture of footwear
242 Repair of footwear
243 Manufacture of apparel
244 Articles other than apparel made from textile materials
249 Manufacture of other articles from textile materials
251 Sawmills and woodworking shops
252 Wooden packing containers
259 Manufacture of other cork and/or wood products
260 Manufacture of furniture and accessories
271 Manufacture of woodpulp, paper, and cardboard
272 Manufacture of articles from woodpulp, paper, and cardboard
279 Manufacture of other articles from woodpulp, paper, and cardboard
280 Printing, publishing, and related industries
291 Tanneries and finishing shops
292 Manufacture of articles from hide
293 Manufacture of other articles from leather or imitation leather
299 Manufacture of miscellaneous articles from leather or imitation leather
300 Manufacture of rubber products
309 Manufacture of other rubber products
311 Basic industrial chemicals
312 Inedible oils and fats, of vegetable and animal origin
313 Manufacture of paint, varnish, and lacquer
319 Manufacture of miscellaneous chemical products
321 Petroleum refineries
329 Manufacture of miscellaneous petroleum and coal products
331 Manufacture of clay products for construction
332 Manufacture of glass and glass products
333 Manufacture of objects from mud, earthenware, and porcelain
334 Manufacture of cement
339 Manufacture of other nonmetal mineral products
341 Basic iron and steel industries
342 Basic nonferrous metal industries
350 Metal products other than transport machinery and equipment
360 Manufacture of machinery other than electrical machinery
369 Manufacture of other machinery and devices
370 Manufacture of electrical machinery and devices
379 Manufacture of other electrical machinery and devices
381 Shipbuilding and repair
382 Manufacture of railway equipment
383 Manufacture of automotive vehicles
384 Repair of automotive vehicles
385 Manufacture, assembly, and repair of motorcycles and bicycles
386 Manufacture of aircraft
389 Manufacture of other transport equipment
391 Manufacture of professional, scientific measuring, and control instruments
392 Manufacture and repair of photographic equipment and optical instruments
393 Watchmaking
394 Manufacture of jewelry and related articles
395 Manufacture of musical instruments
399 Manufacture of articles not elsewhere classified

Appendix Table 6.1. *Colombia: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Sector, 1969*
(percent)

	Nominal Protection			Effective Protection to Value Added				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Agriculture, Forestry, & Fishing (I)																	
1	-51	-51	-51	-51	-51	-51	-50	-70	-70	-70	-49	-49	-49	-49	-69	-69	-69
2	13	2	2	15	1	2	2	-11	-26	-25	26	3	4	4	2	-24	-23
3	13	30	26	10	30	25	25	-17	2	-3	19	27	25	25	-8	0	-2
4	13	0	0	15	0	0	0	-12	-27	-27	23	0	1	1	-2	-27	-26
Processed Foods (II)																	
6	13	3	6	23	3	10	7	-5	-24	-18	37	-6	8	6	8	-32	-19
7	13	15	15	12	15	15	12	-16	-14	-14	23	14	14	11	-7	-15	-15
8	13	42	42	-27	44	43	30	-64	30	29	-11	41	41	29	-42	23	23
9	13	31	31	-146	31	30	11	90[a/]	-43[a/]	-43[a/]	-81	22	22	8	50[a/]	-37[a/]	-37
10	13	-18	-5	87	-18	27	18	43	-41	-5	110	-39	25	16	60	-57	-7
11	13	0	0	75	-6	-6	-3	-357[a/]	20	20[a/]	117	-10	-10	-5	-732[a/]	67[a/]	67[a/]
12	13	-15	-10	26	-15	-8	-7	-3	-41	-34	36	-19	-9	-7	7	-44	-34
13	13	21	21	6	21	21	16	-21	-7	-8	19	19	19	15	-10	-9	-9
14	13	10	10	27	4	5	2	9	-23	-22	71	-3	0	0	55	-37	-33
Beverages and Tobacco (III)																	
15	13	51	51	1	51	51	43	-26	16	15	2	43	43	35	-22	9	9
16	13	51	51	-58	53	53	30	-75	18	18	-55	34	34	19	-61	1	1
17	13	0	0	19	0	0	0	-10	-26	-27	29	-1	-1	-1	-1	-27	-27
Mining & Energy (IV)																	
5	0	-11	-9	1	-12	-10	-9	-26	-40	-38	-1	-14	-12	-11	-29	-43	-40
Construction Materials (V)																	
34	13	8	10	25	8	18	8	36	-12	3	49	-7	11	6	82	-54	-11
63	13	0	1	27	-1	2	1	6	-29	-26	37	-8	-4	-3	14	-38	-33
64	13	6	6	22	5	6	4	5	-21	-20	33	-2	-1	-1	17	-33	-32
65	13	100	86	-13	100	81	61	-82	315	249	-10	92	75	57	-53	258	206
Intermediate Goods I (VIA)																	
18	13	28	23	-7	29	18	12	-33	1	-10	8	19	15	10	-19	-10	-13
20	13	8	9	15	8	10	8	-9	-18	-16	25	4	8	7	3	-24	-18
23	13	62	62	-105	68	68	35	-71027	39603	39387	-84	64	63	33	-1266	759	755
33	13	8	9	22	7	11	7	14	-16	-9	43	-2	9	6	47	-37	-17
43	13	20	19	-3	20	17	11	298	-772	-596[a/]	20	14	15	10	502	250	292
52	13	14	14	12	13	13	9	-16	-15	-15	22	10	10	7	-7	-18	-17
58	13	-15	-10	108	-17	8	5	79	-43	-19	140	-26	7	4	104	-53	-22
59	13	15	15	12	15	15	13	-16	-13	-13	24	14	14	12	-5	-13	-13
Intermediate Goods I (VIA)																	
60	13	15	15	10	15	15	10	-18	-13	-13	28	14	14	10	-2	-15	-15
66	13	30	30	-36	30	30	18	-58	0	0	-12	26	26	15	-36	-6	-6
68	13	43	43	-53	43	43	26	-103	33	33	-33	40	40	23	-71	22	22
Intermediate Goods II (VIB)																	
21	13	8	8	15	8	8	6	-9	-18	-18	26	7	7	5	4	-20	-20
22	13	20	20	-30	20	20	8	30[a/]	-48[a/]	-48[a/]	14	13	13	6	-40[a/]	-38[a/]	-38[a/]
24	13	35	35	-57	38	37	20	70[a/]	-75[a/]	-73[a/]	-30	33	32	17	36[a/]	-71[a/]	-70[a/]
25	13	16	16	-25	11	11	3	-5[a/]	-28[a/]	-27[a/]	61	-2	-2	0	-63[a/]	-18[a/]	-18[a/]
35	13	8	8	26	7	7	4	40	-14	-14	51	4	4	2	90	-28	-28
37	13	8	8	17	7	8	6	-103[a/]	-43[a/]	-47[a/]	30	5	7	5	-205[a/]	-28[a/]	-38[a/]
38	13	8	8	14	7	7	5	-8	-19	-19	24	6	6	4	6	-20	-20
40	13	24	24	-12	27	26	14	209[a/]	-326[a/]	-322[a/]	11	24	24	13	-314[a/]	-945[a/]	-941[a/]
41	13	16	15	-1	15	12	5	-15[a/]	-41[a/]	-36[a/]	36	3	8	4	-79[a/]	-17[a/]	-27[a/]
42	13	22	22	1	22	22	15	-27	2	2	16	21	21	14	-8	-2	-2
45	13	30	30	-10	30	30	22	-39	8	8	7	29	29	21	-21	4	4

(Table continues on the following page.)

Appendix Table 6.1. (continued)

	Nominal Protection			Net Effective Protection to Value Added				Effective Protection to Cash Flow			Net Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
				Balassa			Corden				Balassa			Corden			
	E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Intermediate Goods II (VIB) (continued)																	
47	13	10	10	11	5	5	4	-13	-21	-21	23	4	4	4	3	-23	-23
49	13	51	43	-12	61	46	36	-111	285	204	1	56	45	35	-43	209	158
51	13	43	42	-9	47	45	33	-81	174	166	1	43	41	30	-26	133	128
55	13	51	50	-63	98	93	50	24[a]	-89[a]	-86[a]	-40	88	84	45	6[a]	-88[a]	-85[a]
56	13	55	55	-39	65	65	40	-104	94	92	-26	60	59	37	-70	75	74
57	13	55	55	-572	420	418	56	157[a]	-136[a]	-135[a]	-450	366	364	49	124[a]	-140[a]	-139[a]
67	13	33	33	220	-9	-8	5	44[a]	-27[a]	-27[a]	145	5	6	-1	23[a]	-23[a]	-23[a]
69	13	43	36	-321	137	25	5	397[a]	-195[a]	-50[a]	-227	83	7	2	399[a]	-168[a]	-30[a]
70	13	52	51	-12	65	64	45	-44	56	55	-1	62	61	42	-28	49	48
71	13	33	31	2	37	34	27	-26	28	22	13	33	31	25	-10	20	16
75	13	17	17	8	16	16	13	-18	-9	-9	20	14	14	11	-4	-12	-12
76	13	14	14	3	7	7	15	-24	-18	-18	22	3	3	2	3	-27	-26
77	13	21	21	-4	21	21	14	-74	85	81	15	17	17	12	32	30	31
78	13	43	42	-1068	426	360	34	25[a]	-42[a]	-39[a]	-773	336	288	27	43[a]	-39[a]	-37[a]
79	13	53	47	-45	89	68	36	33[a]	-122[a]	-97[a]	-46	50	42	22	13[a]	-118[a]	-97[a]
87	13	95	95	111	-114	-114	-3849	32	-84[a]	-84[a]	114	-91	-91	-3067	26[a]	-83[a]	-83[a]
89	13	196	193	-252	321	312	124	680[a]	-789[a]	-766[a]	-268	281	272	108	938[a]	-1097[a]	-1066[a]
Nondurable Consumer Goods (VII)																	
19	13	46	46	-38	47	46	30	-143	100	98	-22	44	43	28	-89	74	73
26	13	1	1	40	0	1	0	96	-36	-34	63	-2	-1	-1	142	-45	-42
27	13	22	22	6	22	22	16	-21	-3	-3	18	21	21	16	-8	-5	-5
28	13	22	22	-35	22	22	10	70	-67[a]	-67[a]	9	19	19	8	-26[a]	-57[a]	-57[a]
29	13	22	22	1	22	22	15	-27	1	1	17	21	21	14	-7	32	-2
30	13	1	1	24	-1	-1	-1	5	-30	-30	38	-2	-2	-1	23	-32	-32
31	13	0	0	55	-1	-1	0	103	-34	-34	84	-2	-2	-1	148	-42	-42
32	13	10	9	19	9	9	6	-6	-17	-17	37	8	8	5	13	-20	-20
36	13	8	8	16	8	8	6	-7	-17	-17	26	7	7	6	7	-19	-19
44	13	30	29	-13	30	27	20	-125	140	120	5	28	26	19	-26	86	77
46	13	30	30	-26	31	31	21	-129	71	71	-3	24	29	19	-50	45	45
Nondurable Consumer Goods (VII)																	
48	13	10	10	14	9	9	8	-12	-18	-17	26	7	8	7	2	-19	-19
50	13	35	35	-7	38	38	29	-101	211	211	6	36	36	28	-15	152	152
53	13	90	86	-31	106	98	64	44[a]	-213[a]	-198[a]	-22	100	93	61	26[a]	-218[a]	-204[a]
54	13	16	16	0	11	11	7	-165	158	158	19	5	5	3	234	-41	-41
62	13	19	19	3	19	18	10	-17[a]	-77[a]	-68[a]	14	10	10	6	-160[a]	-54[a]	-59[a]
72	13	14	14	13	14	14	12	-14	-13	-13	21	11	12	10	-6	-15	-14
73	13	32	32	-4	34	34	26	-39	39	30	8	32	32	24	-14	29	29
74	13	25	25	-9	28	28	18	-56	37	37	9	24	24	16	-10	18	18
88	13	8	8	31	2	2	1	-124[a]	-16[a]	-16[a]	48	-26	-26	-11	-323[a]	13[a]	13[a]
92	13	0	0	27	-7	-7	-5	2	-35	-35	45	-9	-9	-7	19	-38	-38
93	13	0	2	18	-2	1	1	-5	-30	-27	28	-4	0	0	8	-34	-28
94	13	0	0	21	-1	-1	-1	-4	-28	-28	31	-2	-2	-2	8	-21	-30
95	13	13	13	13	12	12	10	-14	-14	-14	22	11	11	9	-4	-16	-15
96	13	72	67	-52	122	111	69	-226	401	361	-34	117	107	67	-137	307	279
Consumer Durables (VIII)																	
39	13	8	8	23	8	8	8	108	4	5	41	5	5	3	166	-30	-29
85	13	88	86	-1499	1098	1024	73	112[a]	-98[a]	-92[a]	-1512	813	746	53	104[a]	-97[a]	-91[a]
86	13	92	91	-82	122	120	65	-114	337	330	-84	101	99	53	-208	222	217

(Table continues on the following page.)

Appendix Table 6.1 (continued)

		Nominal Protection			Effective Protection to Value Added				Effective Protection to Cash Flow			Effective Subsidy to Value Added				Effective Subsidy to Cash Flow		
					Balassa			Corden				Balassa			Corden			
		E	D	A	E	D	A	A	E	D	A	E	D	A	A	E	D	A
Machinery (IX)																		
	79	13	53	47	-45	89	68	36	33	-122	-97	-46	58	42	22	13	-118	-97
	80	13	20	19	6	20	18	12	-19	7	3	8	21	5	3	-13	-25	-23
	81	13	31	30	-6	33	31	21	-44	40	36	-5	17	16	11	-26	0	-2
	82	13	22	21	-86	23	18	3	-12[a/]	-25[a/]	-25[a/]	-75	-64	-64	-12	-22[a/]	-23[a/]	-23[a/]
	83	13	55	55	12	56	56	56	-15	26	26	11	47	47	47	-14	18	18
	84	13	43	42	45	61	60	33	1658[a/]	-1264[a/]	-1237[a/]	-41	39	38	21	-846	919	903
Transport Equipment (X)																		
	90	13	143	143	-87	219	219	140	731	-1799[a/]	-1799[a/]	-69	220	220	140	778[a/]	-2273[a/]	-227[a/]
	91	13	69	69	-135	88	88	42	83	-87[a/]	-87[a/]	-104	88	89	42	65[a/]	-87[a/]	-87[a/]

a/ Negative cash flow at free-trade prices.

Key to Sectors

Sector Numbers 1-96 are tradeable sectors; numbers 97-121 are nontradeable.

Primary Activities	1	Coffee
	2	Agriculture and Cattle Raising
	3	Forestry
	4	Fishing
	5	Mining
Processed Foods	6	Meat Preparation
	7	Milk Products
	8	Canning and Preservation of Fruit and Vegetables
	9	Canning and Preservation of Fish Products
	10	Milling
	11	Baked Goods
	12	Sugar Refining
	13	Candy Manufacture
	14	Diverse Food Products
Beverages and Tobacco	15	Spirituous Beverages
	16	Wine Making
	17	Cigarettes and Cigars
	97	Breweries
	98	Soft drinks
Construction Materials	34	Wood for Construction
	63	Cement
	64	Asbestos Cement Products
	65	Other Nonmetallic Mineral Products
	107	Brick Making
	109	Marble and Granite Works
Intermediate Goods I	18	Spinning Industries
	20	Rope Manufacture
	23	Artificial Fiber Manufacture
	33	Wood Preparation and Preservation
	43	Tanneries
	52	Oils and Fats
	58	Petroleum Refineries
	59	Asphalt
	60	Coke and other Coal and Petroleum Derivatives
	66	Basic Iron and Steel
	68	Basic Nonferrous Metals
Intermediate Goods II	21	Cotton Textiles
	22	Wool Textiles
	24	Hard Fiber Textiles
	25	Other Textiles
	37	Other Wood Products
	38	Cork Products
	40	Pulp and Paper
	41	Paper Goods
	42	Cupboard
	45	Leather Industrial Products
	47	Tires and Tubes
	49	Rubber Industrial Products
	51	Chemical Products
	55	Paints
	56	Glues and Water Proofing Agents
	57	Other Chemical Products
	67	Manufactures of Iron and Steel
	69	Manufactures of Nonferrous Metals
	70	Tin Plate Manufactures
	71	Hand Tools and Knives
	75	Wire Products
	76	Foundry Products
	77	Diverse Metal Products
	78	Other Metal Manufactures
	87	Electrical Wire and Cable
	89	Other Electrical Goods
	106	Compressed Gases

(Table continues on the following page.)

Appendix Table 6.1 (continued)

Nondurable Consumer Goods	19	Knitting Mills
	26	Shoe Making
	27	Men's Clothing
	28	Women's Clothing
	29	Children's Clothing
	30	Hat Making
	31	Nonclothing Textile Products
	32	Other Clothing
	35	Wood Carvings and Wood Toys
	36	Toothpicks
	44	Leather Products
	46	Leather Sporting Goods
	48	Rubber Shoes and Household Goods
	50	Rubber Sporting Goods
	53	Drugs
	54	Soap
	63	Ceramics
	72	Cutlery
	73	Kitchenware
	74	Aluminum Articles
	88	Light Bulbs
	92	Medical and Scientific Equipment
	93	Optical Goods
	94	Jewelry
	95	Phonograph Records
	96	Diverse Industries
	99	Shoe Repair
	100	Bamboo Furniture
	101	Printing
	102	Photogravure
	104	Other Graphic Arts
	105	Matches
	108	Plaster and Limestone Objects
	114	Watch Repair
	115	Dental Laboratories
Consumer Durables	39	Wood Furniture
	85	Radio and Television Apparatus
	86	Electrical Appliances
	91	Bicycle Manufacture
Machinery	79	Motor Driven Machinery
	80	Agricultural Machinery
	81	Industrial Machinery
	82	Parts for Agricultural and Industrial Machinery
	83	Other Machinery
	84	Electrical Machinery
Transport Equipment	90	Automobile and Truck Assembly
	110	Ship Repair
	111	Railroad Equipment Repair
	112	Automobile Repair
	113	Airplane Repair
Services	116	Construction
	117	Transportation
	118	Communications
	119	Electricity, Gas, and Water
	120	Banks and Insurance
	121	Commerce, Professional Services, and Artisans

Appendix Table 7.1. *Israel: Nominal and Effective Protection Rates, Credit Subsidies, and Investment and Tax Exemptions, by Sector, 1968*
(percent)

Sector	Nominal Protection			Effective Protection Balassa			Credit Subsidies (I£ million)			Investment and Tax Exemptions (I£ million)		
	E	D	A	E	D	A	E	D	A	E	D	A
	101	102	103	107	108	109	28	31	34	38	39	37
12	0	0	0	-5	-5	-5	0	1	1	0	0	0
13	n.a.	17	17	n.a.	25	25	0	3	3	0	0	0
15	13	14	14	45	40	41	3	7	10	0	0	0
16	27	65	40	70	164	100	1	0	1	0	0	0
17	n.a.	36	36	n.a.	36	36	0	0	0	0	0	0
19	n.a.	80	80	n.a.	123	123	0	0	0	0	0	0
20	19	0	1	30	-4	-2	1	4	5	0	0	0
30	15	30	30	33	86	84	1	13	14	0	0	0
31	n.a.	67	67	n.a.	750	750	0	12	12	0	0	0
33	n.a.	50	50	n.a.	132	132	0	2	2	0	0	0
40	12	13	12	24	24	24	22	5	27	0	0	0
50	n.a.	57	57	n.a.	89	89	1	8	8	0	0	0
51	n.a.	0	0	n.a.	-1	-1	0	2	2	0	0	0
54	18	38	35	41	69	65	0	2	2	0	0	0
60	n.a.	0	0	n.a.	0	0	0	1	1	0	0	0
70	n.a.	25	25	n.a.	155	155	0	1	1	0	0	0
80	n.a.	0	0	n.a.	0	0	0	0	0	0	0	0
99	n.a.	0	0	n.a.	0	0	0	1	1	0	0	0
101	12	n.a.	12	19	n.a.	19	1	0	1	0	0	0
120	12	12	12	15	15	15	1	0	1	0	0	0
131	n.a.	37	37	n.a.	51	51	0	0	0	0	0	0
199	12	12	12	3	3	3	0	0	0	0	0	0
202	n.a.	67	67	n.a.	-943	-943	0	3	3	0	0	0
203	13	21	16	17	44	27	1	1	2	0	0	1
204	n.a.	6	6	n.a.	18	18	0	0	0	0	0	0
208	n.a.	0	0	n.a.	-12	-12	0	0	0	0	0	0
209	n.a.	32	32	n.a.	68	68	0	0	0	0	0	0
210	n.a.	360	360	n.a.	-392	-392	0	1	1	0	0	0
211	12	80	75	57	300	288	0	1	1	0	2	2
212	12	12	12	63	38	39	0	0	0	0	0	0
213	n.a.	43	43	n.a.	119	119	0	0	0	0	0	0
216	n.a.	50	50	n.a.	204	204	0	0	0	0	0	0
217	4	4	4	149	149	150	0	0	0	0	0	0
219	3	90	69	-124	397	161	0	1	1	0	0	0
220	54	60	56	340	206	232	1	3	4	1	2	3
221	50	56	54	233	180	197	1	2	3	1	2	3
223	43	72	65	74	130	116	2	6	7	1	0	6
225	24	80	55	2	120	68	0	1	1	1	3	5
230	29	98	62	14	184	139	0	2	2	0	1	1
240	41	31	34	89	48	59	1	1	2	0	0	0
241	n.a.	0	0	n.a.	-32	-32	0	0	0	0	0	0
242	n.a.	12	12	n.a.	-17	-17	0	0	0	0	0	0
243	n.a.	56	56	n.a.	66	66	0	2	2	0	1	1
250	n.a.	40	40	n.a.	174	174	0	2	2	0	4	4
251	11	34	32	5	51	46	0	2	2	0	2	2
270	13	34	30	33	246	156	0	0	0	0	0	0
271	n.a.	45	45	n.a.	50	50	0	0	0	0	0	0

(Table continues on the following page.)

Appendix Table 7.1 (continued)

Sector	Nominal Protection			Effective Protection Balassa			Credit Subsidies (I£ million)			Investment and Tax Exemptions (I£ million)		
	E	D	A	E	D	A	E	D	A	E	D	A
279	n.a.	70	70	n.a.	70	70	0	0	0	0	0	0
280	n.a.	57	57	n.a.	186	186	0	2	2	0	1	1
281	13	45	27	11	109	61	1	2	4	1	1	2
283	7	68	61	-381	183	189	0	2	2	0	1	1
290	12	53	37	33	218	133	4	12	17	0	1	1
291	10	60	42	9	442	159	0	1	1	0	0	0
294	n.a.	62	62	n.a.	254	254	0	0	0	0	0	0
295	n.a.	44	44	n.a.	449	449	0	3	3	0	0	0
300	n.a.	10	10	n.a.	6	6	0	0	0	0	0	0
301	9	61	52	-8	120	107	0	1	1	0	0	0
302	n.a.	51	51	n.a.	98	98	0	0	0	0	0	0
304	n.a.	0	0	n.a.	2	2	0	1	1	0	1	1
305	n.a.	0	0	n.a.	0	0	0	1	1	0	1	1
309	n.a.	31	31	n.a.	57	57	0	1	1	0	0	0
310	1	n.a.	1	0	n.a.	0	16	0	16	0	0	0
320	n.a.	41	41	n.a.	301	301	0	1	1	0	1	1
321	n.a.	31	31	n.a.	53	53	0	1	1	0	0	0
322	n.a.	10	10	n.a.	19	19	0	0	0	0	3	3
323	6	46	40	16	18	168	0	1	1	0	0	0
330	10	46	34	-36	186	55	0	0	0	0	0	0
331	n.a.	20	20	n.a.	28	28	0	1	1	0	0	0
332	n.a.	42	42	n.a.	86	86	0	0	0	0	0	0
333	10	35	25	-5	58	29	0	0	0	0	0	0
334	10	69	50	5	134	92	0	1	1	0	0	0
335	n.a.	29	29	n.a.	29	29	0	3	3	0	0	0
336	n.a.	65	65	n.a.	201	201	0	0	0	0	0	0
340	10	17	16	6	13	13	0	1	1	0	1	1
341	n.a.	2	2	n.a.	-6	-6	0	0	0	0	0	0
342	n.a.	73	73	n.a.	198	198	0	1	1	0	0	0
343	n.a.	35	35	n.a.	41	41	0	0	0	0	0	0
350	10	47	39	-24	141	109	0	0	0	0	0	0
351	10	30	29	1	5	47	0	1	1	0	0	0
352	n.a.	44	44	n.a.	105	105	0	1	1	0	0	0
353	n.a.	46	46	n.a.	90	90	0	0	0	0	0	0
354	10	112	87	-12	648	357	0	0	0	0	1	1
355	n.a.	42	42	n.a.	107	107	0	0	0	0	1	1
360	n.a.	57	57	n.a.	188	188	0	1	1	0	3	3
364	n.a.	0	0	n.a.	0	0	0	3	3	0	0	0
369	n.a.	0	0	n.a.	0	0	0	0	0	0	0	0
390	n.a.	0	0	n.a.	0	0	0	0	0	0	0	0
391	n.a.	0	0	n.a.	0	0	0	0	0	0	0	0
392	n.a.	0	0	n.a.	0	0	0	0	0	0	0	0
393	n.a.	0	0	n.a.	0	0	0	0	0	0	0	0
394	n.a.	82	82	n.a.	279	279	0	0	0	0	0	0
395	n.a.	0	0	n.a.	0	0	0	0	0	0	0	0
399	n.a.	0	0	n.a.	0	0	0	0	0	0	0	0
	11	24	21	19	53	46	59	153	212	8	42	50

(Table continues on the following page.)

Appendix Table 7.1 (continued)
Key to Sectors

12 Watermelon, melon, and pumpkin crops
13 Peanut farms
15 Cotton
16 Groundnuts
17 Tobacco
19 Other industrial crops
20 Vegetable farms (excl. potato farms)
30 Poultry farming
31 Dairy cattle raising
33 Goat farms
40 Citrus groves
50 Deciduous orchards
51 Table and wine grapes
54 Banana groves
60 Forestry and logging
70 Fishing
80 Mechanical equipment services to agriculture
99 Agriculture, n.e.c.
101 Metal mining
120 Salt and potash pans operations
131 Crude oil and natural gas wells
199 Mining and quarrying of nonmetallic minerals, n.e.c.
202 Manufacture of dairy products
203 Fruit and vegetable canning
204 Manufacture of margarine and oil products
208 Manufacture of mazot (unleavened bread)
209 Manufacture of noodles and dough products, n.e.c.
210 Sugar factories and refineries
211 Manufacture of chocolate and sweets
212 Wine industries, distilling, and blending of spirits
213 Breweries and manufacturing of malt
216 Manufacture of tobacco products
217 Oil distilling
219 Manufacture of food, n.e.c.
220 Spinning, winding, and interweaving (excl. wool)
221 Spinning, winding, and interweaving of woolen yarns
223 Weaving of fabrics
225 Knitting mills
230 Manufacture of outerwear (incl. tailors and dressmakers)
240 Basic manufacture of wood
241 Manufacture of wood products (excl. furniture and building construction) and cork products
242 Carpentries for building construction
243 Manufacture of furniture (excl. metal furniture)
250 Basic manufacture of paper and cardboard
251 Manufacture of paper and cardboard products
270 Tanneries
271 Manufacture of footwear
279 Manufacture of leather and leather substitute products, n.e.c.
280 Manufacture of rubber products (other than tires)
281 Manufacture of tires
283 Plastic products
290 Manufacture of basic industrial chemicals
291 Pharmaceutical industry
294 Manufacture of paints, varnishes, and lacquers
295 Manufacture of insecticides, fungicides, and disinfectants
300 Clay and lime for building
301 Manufacture of glass and glass products
302 Manufacture of ceramic products for sanitary and electrical uses
303 Manufacture of ceramic products for household uses and artistic ceramics
304 Manufacture of cement
305 Manufacture of cement products
309 Manufacture of nonmetallic mineral products, n.e.c.
310 Diamond industry
320 Iron and steel basic industries (other than foundries)
321 Iron and steel foundries
322 Nonferrous basic metal industries
323 Manufacture of metal pipes
330 Manufacture of plumbing fixtures
331 Manufacture of tinware and other fabricated metal product (excl. cooking equipment)
332 Manufacture of wire and wire products
333 Manufacture of heating and cooking equipment (nonelectrical)
334 Manufacture of cutlery hand tools and general hardware
335 Manufacture of structural metal products
336 Manufacture of cooking utensils, (nonelectrical)
340 Manufacture of industrial and building machinery
341 Manufacture of agricultural machinery
342 Manufacture of commercial and domestic machinery
343 Manufacture of pumps, compressors, and pumping equipment
350 Manufacture of electrical motors and transformers
351 Manufacture of electrical supplies, switches, and lamps
352 Manufacture of batteries and accumulators
353 Manufacture of domestic electrical appliances
354 Manufacture of radios, gramophones, and television equipment
355 Manufacture of communication equipment
360 Manufacture and assembly of motor vehicles, motorcycles and scooters, and parts
364 Manufacture, assembly, and repair of airplanes and aircraft parts
369 Manufacture and repair of vehicles, n.e.c.
390 Manufacture of scientific measuring and controlling instruments
391 Manufacture of photographic and optical goods
392 Manufacture and assembling of watches
393 Manufacture of jewelry, art, religious goods, and watch repairs
394 Manufacture of pens, pencils, office and school supplies, n.e.c.
395 Basket work, straw and raffia plaiting
399 Miscellaneous manufacturing industries, n.e.c.

Appendix Table 8.1. *Korea: Nominal Protection, Effective Protection, and Effective Subsidy Rates, by Sector, 1968*
(percent)

Industry Group, Sector, and Trade Category		Nominal Protection				Effective Protection				Effective Subsidy			
		Tariff		Nominal		Balassa			Corden	Balassa			Corden
		D	A	D	A	E	D	A	A	E	D	A	A
I. Agriculture, Forestry, & Fishing													
1. Rice	NIC	23	23	13	13	0	15	15	15	3	20	20	19
2. Barley & Wheat	IC	23	23	46	46	0	68	68	67	5	76	76	74
3. Pulses & Misc. Cereals	NIC	25	25	0	0	0	-1	-1	-1	7	4	4	4
4. Potatoes	NIC	40	40	0	0	0	-1	-1	-1	9	3	3	3
5. Vegetables	NIC	206	203	91	90	0	144	142	138	6	155	153	149
6. Fruit	NIC	24	24	0	0	-2	-15	-15	-12	3	-15	-15	-12
7. Tobacco	NIC	138	138	0	0	0	-3	-3	-3	0	-3	-3	-2
8. Medical Crops	X	16	2	-35	-35	-43	-45	-43	-42	-40	-45	-41	-40
9. Misc. Crops	NIC	21	21	19	19	0	23	23	22	-5	21	21	21
10. Poultry	NIC	21	21	20	20	-1	12	12	11	8	12	12	11
11. Livestock	NIC	9	9	0	0	-1	-13	-13	-13	-1	-14	-14	-13
12. Forest Products	NIC	10	10	6	6	-1	5	5	4	1	5	5	5
13. Fishing	NIC	32	30	0	0	2	-5	-4	-4	12	1	2	2
II. Processed Foods													
14. Slaughtered & Processed Meat	X	34	30	0	0	-7	-5	-5	-4	28	-16	-13	-8
15. Dairy Products	IC	93	93	17	17	-8	35	35	23	-14	16	16	10
16. Processed Fruits & Vegetables	X	111	88	11	9	-3	-29	-24	-20	29	-43	-30	-24
17. Canned Seafoods	X	100	29	11	3	-4	16	2	2	13	6	11	8
18. Seaweed	X	31	21	-60	-42	-1	-93	-67	-61	-3	-98	-71	-64
19. Other Processed Seafoods	X	35	22	0	0	-5	-9	-8	-6	3	-28	-18	-13
20. Grain Milling	NIC	34	34	0	0	-5	-15	-15	-13	-3	-13	-13	-11
21. Bakery Products	NIC	123	123	24	24	-16	154	154	74	-16	132	132	63
22. Confectionery	NIC	119	119	9	9	-5	-20	-20	-15	-18	-35	-35	-27
23. Refined Sugar	NIC	40	39	0	0	0	-44	-43	-37	5	-51	-49	-43
24. Seasonings & Oils	NIC	95	94	11	11	-4	-23	-23	-18	-4	-37	-36	-29
25. Other Food Preparations	IC	84	83	18	18	-11	61	61	39	0	47	46	30

(Table continues on the following pages.)

Appendix Table 8.1 (continued)

Industry Group, Sector, and Trade Category		Nominal Protection: Tariff D	Nominal Protection: Tariff A	Nominal Protection: Nominal D	Nominal Protection: Nominal A	Effective Protection: Balassa E	Effective Protection: Balassa D	Effective Protection: Balassa A	Effective Protection: Corden A	Effective Subsidy: Balassa E	Effective Subsidy: Balassa D	Effective Subsidy: Balassa A	Effective Subsidy: Corden A
III. Beverages & Tobacco													
26. Beer	NIC	148	139	6	5	-5	-13	-13	-9	-8	-29	-28	-21
27. Other Alcoholic Beverages	NIC	133	133	19	19	-7	29	29	20	-15	8	8	6
28. Soft Drinks	NIC	98	96	3	3	-7	-22	-22	-14	-1	-28	-28	-18
29. Processed Tobacco	NIC	150	140	-13	-13	-1	-45	-42	-39	19	-42	-39	-35
IV. Mining & Energy													
30. Coal	NIC	10	10	10	10	-2	5	5	4	7	9	9	8
31. Iron Ore	X	0	0	0	0	0	-7	-1	-1	0	10	1	1
32. Tungsten Ore	X	0	0	0	0	-1	-6	-2	-2	5	-29	-3	-3
33. Lead Ore	X	0	0	0	0	-2	-15	-7	-6	4	-22	-7	-6
34. Zinc Ore	X	0	0	0	0	-3	-13	-5	-4	4	-17	-1	-1
35. Gold, Silver, & Copper Ores	XIC	0	0	17	14	-3	20	17	13	11	29	26	19
36. Other Metallic Minerals	X	0	0	0	0	-3	-7	-4	-3	-2	-11	-4	-3
37. Quarry Products	NIC	10	9	0	0	0	-5	-5	-5	5	-4	-3	-3
38. Graphite	NIC	9	9	0	0	-2	-10	-10	-9	0	-11	-11	-10
39. Talc	X	18	7	11	4	-2	8	2	2	1	0	1	0
40. Fluorite	X	10	8	0	0	-1	-12	-9	-8	3	-16	-12	-10
41. Silica Sand & Limestone	NIC	8	8	4	4	0	-2	-2	-2	4	-3	-3	-3
42. Nonmetallic Minerals	XIC	10	3	1	0	-1	-3	-2	-1	2	-9	-1	-1
43. Raw Salt	NIC	142	142	90	90	-7	197	197	133	-42	169	169	114
V. Construction Materials													
44. Cement	NIC	15	13	3	3	-5	-17	-16	-12	7	-15	-13	-10
45. Clay & Concrete Products	NIC	48	48	7	7	-4	-2	-2	-1	-6	-17	7	-13
46. Other Clay & Stone Products	NIC	51	49	1	1	-7	-19	-19	-14	-1	-22	-21	-15
VIA. Intermediate Products I													
47. Cotton Yarn	NIC	23	23	0	0	19	-19	-19	-15	17	-24	-24	-19
48. Silk Yarn	X	35	5	0	0	-2	-3	-3	-2	-5	-18	-7	-6
49. Worsted & Woolen Yarns	NIC	61	59	60	59	-113	1,787	1,873	380	-17	1,557	1,628	330
50. Hemp & Flax Yarns	NIC	77	75	38	37	-7	124	121	88	100	181	179	130
51. Other Yarns	IC	40	39	23	22	7	20	19	12	56	53	53	33
52. Rope & Fishing Nets	X	60	46	11	9	-2	-16	-13	-10	21	-20	-12	-9
53. Lumber	NIC	26	26	0	0	34	-30	-29	-18	25	-43	-42	-26
54. Plywood	X	46	10	0	0	71	-54	35	16	96	-69	49	22
55. Leather & Fur	NIC	45	45	0	0	-1	-15	-15	-12	-13	-30	-30	-24

(Table continues on the following pages.)

Appendix Table 8.1 (continued)

Industry Group, Sector, and Trade Category		Nominal Protection				Effective Protection				Effective Subsidy			
		Tariff		Nominal		Balassa			Corden	Balassa			Corden
		D	A	D	A	E	D	A	A	E	D	A	A
56. Synthetic Resins & Fibers	IC	41	41	24	24	-1	53	52	37	29	71	71	49
57. Petroleum Products	NIC	40	38	-26	-25	1	-70	-67	-63	2	-73	-70	-66
58. Briquettes	NIC	35	35	19	19	-46	60	60	28	-48	46	46	21
59. Other Coal Products	NIC	5	5	5	5	-13	-15	-15	-8	-23	-25	-25	-13
60. Glass Products	IC	90	88	9	9	3	-7	-6	-5	5	-16	-16	-12
61. Pig Iron	IC	9	9	15	14	-30	56	55	28	674	500	501	260
62. Steel Ingots	NIC	11	11	11	11	-17	-24	-24	-12	-13	-29	-29	-15
63. Copper	IC	28	28	28	28	-36	87	86	35	-26	67	67	27
64. Other Nonferrous Metals	XIC	12	9	31	23	-17	144	115	61	18	126	106	57
VIB. Intermediate Products II													
65. Cotton Fabrics	X	88	74	28	23	-33	285	270	152	350	296	298	168
66. Silk Fabrics	XIC	130	92	64	45	13	535	445	199	41	480	405	181
67. Worsted & Woolen Fabrics	X	77	68	37	32	-3	20	17	13	-9	-1	-2	-2
68. Hemp Fabrics	NIC	93	91	23	22	-3	4	4	3	-6	-8	-8	-7
69. Rayon Fabrics	X	90	67	3	2	3	-37	-27	-23	16	-38	-25	-21
70. Other Fabrics	XIC	68	38	29	16	6	24	17	12	22	22	22	16
71. Dyeing & Finishing	NIC	0	0	0	0	-1	-24	-24	-19	-7	-34	-34	-26
72. Wood Products	NIC	62	59	2	2	-5	-12	-12	-8	3	-15	-14	-10
73. Pulp	IC	0	0	0	0	-9	-12	-12	-8	21	15	15	10
74. Paper & Paperboard	IC	45	45	15	15	-9	23	23	15	-13	4	4	3
75. Other Paper Products	NIC	84	79	11	11	-4	6	6	4	-5	-11	-10	-8
76. Tires & Tubes	NIC	99	94	0	0	1	-54	-51	-42	-17	-70	-67	-55
77. Other Rubber Products	NIC	54	50	16	15	-2	2	1	1	-7	-17	-16	-11
78. Basic Inorganic Chemicals	IC	49	47	23	22	-1	38	37	21	17	33	32	19
79. Processed Oils & Fats	IC	45	44	37	36	6	150	148	77	87	109	109	57
80. Synthetic Dyes	IC	81	78	53	51	-22*	1,929	2,121	133	-95*	1,996	2,201	138
81. Other Basic Organic Chemicals	NIC	42	42	17	17	2	9	9	6	-2	-7	-7	-4
82. Explosives	NIC	25	25	1	1	1	-41	-41	-31	6	-39	-39	-29
83. Paint & Printing Ink	NIC	96	95	68	67	-9	565	564	144	-79	569	568	145
84. Pesticides	NIC	29	29	47	47	2	79	79	62	-11	74	74	58
85. Other Chemical Products	IC	63	63	16	16	-1	8	8	5	11	16	16	11
86. Fertilizers	IC	0	0	5	5	-11	-5	-5	-3	61	47	47	29
87. Steel Sheet & Bars	IC	25	24	29	28	16*	1,526	1,666	136	-69*	1,452	1,593	130
88. Steel Pipes	IC	35	35	111	108	6*	-262	-254	-3,138	3*	-245	-237	-2,927
89. Galvanized & Plated Steel	IC	44	44	43	43	95*	502	502	127	-715	635	635	161
90. Cast & Forged Steel	NIC	35	35	10	10	-6	-4	-4	-3	-3	-17	-17	-12
91. Nonferrous Primary Products	XIC	29	19	8	5	-4	-26	-19	-13	4	-33	-21	-14

(Table continues on the following pages.)

Appendix Table 8.1 (continued)

Industry Group, Sector, and Trade Category		Nominal Protection				Effective Protection				Effective Subsidy			
		Tariff		Nominal		Balassa			Corden	Balassa			Corden
		D	A	D	A	E	D	A	A	E	D	A	A
92. Iron Bar & Frame	NIC	39	39	0	0	-3	53	52	37	29	71	71	49
93. Metal Construction Products	IC	54	52	21	20	-6	-70	-67	-63	2	-73	-70	-66
94. Tools & Other Metal Products	XIC	58	36	43	27	-8	60	60	-28	-48	46	46	21
95. Light Bulbs	NIC	76	71	16	15	-4	-15	-15	-8	-23	-25	-25	-13
96. Insulated Wire & Cable	IC	57	56	76	75	11*	-7	-6	-5	5	-16	-16	-12
97. Synthetic Resin Products	NIC	92	90	0	0	5	56	55	28	674	500	501	260
VII. Nondurable Consumer Goods													
98. Knit Fabrics	X	150	61	29	12	-3	40	16	-12	3	18	10	75
99. Apparel & Accessories	X	154	107	12	8	-1	-31	-22	-18	8	-37	-25	-20
100. Straw Products	NIC	68	65	39	38	-2	69	67	56	3	63	61	51
101. Ribbon, Tape, & String	X	67	52	19	14	-3	19	15	12	13	15	15	12
102. Other Textile Products	XIC	96	39	0	0	-4	-47	-23	-17	0	-57	-25	-19
103. Printing & Publishing	NIC	24	24	0	0	-1	-21	-21	-17	7	-24	-24	-19
104. Leather Shoes	X	100	90	7	7	-2	-4	-3	-3	6	-12	-10	-9
105. Other Leather Products	X	102	88	14	13	-8	20	17	10	13	3	4	2
106. Rubber Shoes	X	99	56	0	0	2	-52	-31	-25	3	-65	-38	-31
107. Drugs	NIC	50	50	5	5	1	-13	-13	-9	-4	-36	-36	-25
108. Soap & Surfactants	IC	70	70	0	0	2	-49	-49	-39	-4	-55	-55	-44
109. Cosmetics & Toothpaste	NIC	139	139	23	23	-7	25	25	16	100	3	3	2
110. Pottery	IC	77	76	50	50	-5	181	180	97	110	179	179	96
111. Measuring Instruments	NIC	45	41	61	56	-18	279	260	111	91	266	255	108
112. Medical & Sanitary Instruments	IC	54	53	2	2	-3	-26	-26	-19	17	-30	-29	-22
113. Optical Instruments	X	61	20	14	5	6	-8	1	1	25	-12	12	9
114. Photographic Materials	XIC	100	80	100	80	8*	-340	-257	1,193	-7*	-328	-251	1,166
115. Jewelry & Lacquerware	NIC	95	93	61	59	-4	130	127	86	23	104	102	69
116. Processed Bristles	X	0	0	0	0	-3	-3	-3	-2	2	-7,392	0	0
117. Toys & Sporting Goods	XIC	100	75	6	4	-4	-20	-17	-12	14	-30	-20	-14
118. Musical Instruments	XIC	100	90	22	20	-9	38	34	20	34	29	29	17
119. Stationery	NIC	105	103	21	20	3	13	13	9	41	7	8	5
120. Personal Accessories	XIC	0	0	0	0	-3	-3	-3	-3	4	-9	2	1
121. Other Manufacturing	X	52	42	45	36	28	115	102	66	70	97	94	60
VIII. Consumer Durables													
122. Household Metal Products	XIC	100	82	4	3	-4	-39	-33	-24	9	-43	-35	-25
123. Household Electronic Equipment	XIC	101	70	72	50	-12	224	164	80	-29	135	93	45

(Table continues on the following page.)

Appendix Table 8.1 (continued)

Industry Group, Sector, and Trade Category		Nominal Protection: Tariff D	Nominal Protection: Tariff A	Nominal Protection: Nominal D	Nominal Protection: Nominal A	Effective Protection: Balassa E	Effective Protection: Balassa D	Effective Protection: Balassa A	Effective Protection: Corden A	Effective Subsidy: Balassa E	Effective Subsidy: Balassa D	Effective Subsidy: Balassa A	Effective Subsidy: Corden A
124. Electronic Components	XIC	23	2	23	2	-3	51	1	1	9	65	13	10
125. Electric Appliances	IC	117	115	113	112	19*	-1,288	-1,249	552	-139	-1,035	-1,008	445
126. Bicycles & Carts	NIC	97	97	21	21	-5	7	7	5	1	-7	-7	-5
127. Watches & Clocks	IC	88	87	72	71	-70	604	600	158	396	573	572	151
IX. Machinery													
128. Prime Movers	XIC	60	54	41	37	-9	99	90	55	7	84	77	48
129. Boilers	NIC	49	49	4	4	-3	-25	-25	-20	-7	-29	-29	-24
130. Metal Working Machinery	IC	21	21	5	5	-4	-14	-14	-11	-7	-19	-19	-15
131. Metal Processing Machinery	IC	27	26	12	12	-5	5	5	4	22	14	14	10
132. Farm Machinery	IC	59	58	52	51	-25	231	228	93	91	202	201	82
133. Mining & Construction Machinery	NIC	10	10	3	3	-4	-23	-22	-17	0	-26	-25	-19
134. Textile Machinery	IC	14	14	1	1	-4	-21	-21	-17	0	-20	-20	-16
135. Special Industrial Machinery	IC	33	30	17	15	-6	13	12	9	0	6	6	4
136. General Industrial Machinery	IC	50	50	9	9	-4	-7	-7	-5	1	-11	-11	-8
137. Office & Service Machines	XIC	83	70	28	24	-6	50	42	29	11	46	42	29
138. Sewing Machines	IC	67	65	22	21	-5	20	19	14	-15	5	4	3
139. Machinery Components	IC	71	68	62	59	-7	273	265	122	-5	246	239	110
140. Generators	NIC	9	9	6	5	-4	-12	-11	-9	25	6	7	6
141. Transformers	XIC	65	44	88	59	-46	837	718	161	27	728	633	142
142. Electric Motors	NIC	71	71	33	33	-8	46	46	31	31	26	26	17
143. Industrial Electric Equipment	NIC	31	30	25	24	-5	15	15	10	3	2	2	2
144. Electronic Equipment	IC	54	52	47	45	-12	120	115	62	1	89	86	46
145. Other Electrical Equipment	NIC	85	83	26	26	-8	53	51	30	-13	31	30	17
X. Transport Equipment													
146. Steel Ships	IC	10	10	16	16	-3	6	6	5	15	18	18	15
147. Wooden Ships	IC	50	50	42	42	-4	110	110	85	-2	110	110	85
148. Railroad Equipment	IC	0	0	55	55	15*	-436	-436	202	13*	-441	-441	205
149. Motor Vehicles	IC	124	121	90	88	47*	-18,405	-13,412	243	21*	-17,969	-13,101	238
150. Automotive Repairs	NIC	0	0	0	0	-3	-25	-25	-21	-8	-32	-32	-27

Note: Because of rounding zero denotes any value greater than or equal to -0.5 and less than 0.5.

* Denotes that estimated value added in exports at exporters' producer prices and at world prices are both negative. See the discussion on the structure of export incentives in the section "Estimates of Effective Incentives, 1968."

Source: Westphal and Kim, "Industrial Policy and Development in Korea," Annex Tables 2.A and 2.B.

Appendix Table 9.1. *Singapore: Protection Rates, by Four-digit Commodity Group, 1967*
(percent)

SIC Code		Tariff/Export Subsidy		Implicit Tariff		Nominal Rate of Protection		Effective Rate of Protection (%)			Nominal Tariff on Inputs
		Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Balassa Domestic Sales	Balassa Average	Corden Average	
2022	Milk Products*	24	22	-14	-13	24	22	747	708	395	3
2032	Sauces	16	10	n.a.	n.a.	16	10	+5	3	3	14
2061	Biscuits	30	29	8	8	30	29	229	222	155	9
2062	Bakery Products	1	1	n.a.	n.a.	1	1	-14	-13	-12	10
2080	Confectionery	60	3	16	6	16	6	-52	-19	-18	88
2091	Vermicelli, Noodles, etc.	12	11	10	10	12	11	47	45	36	4
2096	Coffee Powder	0	0	0	0	0	0	0	0	0	0
2097	Animal Feed	0	0	0	0	0	0	-38	-23	-22	11
2098	Ice	0	0	0	0	0	0	-1	0	0	2
2099	Other Food Processing*	13	8	6	4	6	4	10	6	6	2
2110/30	Alcoholic Beverages	33	20	2	1	2	1	2	1	1	1
2140	Nonalcoholic Beverages	0	0	0	0	0	0	-2	-2	-2	1
22	Tobacco	190	164	28	25	28	25	98	86	84	2
23	Textiles	27	15	17	10	17	10	30	17	16	2
2411	Footwear	40	21	20	11	20	11	34	18	18	2

(Table continues on the following page.)

Appendix Table 9.1 (continued)

SIC Code		Tariff/Export Subsidy		Implicit Tariff		Nominal Rate of Protection		Effective Rate of Protection (%)			Nominal Tariff on Inputs
		Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Balassa Domestic Sales	Balassa Average	Corden Average	
2431	Tailoring & Dressmaking	0	0	0	0	0	0	-2	-2	-2	2
2432	Clothing Other than Shirts	0	0	0	0	0	0	-7	-2	-2	3
2433	Shirts	0	0	0	0	0	0	-8	-2	-2	3
2434	Undergarments	20	13	10	6	10	6	-15	-10	-9	24
2436	Umbrellas, Parasols	0	0	0	0	0	0	-10	-8	-8	2
2441	House Furnishings	0	0	0	0	0	0	-11	0	0	2
2499	Other Made-Up Textiles	0	0	0	0	0	0	-6	-4	-4	2
2511	Sawmilling	0	0	0	0	0	0	0	0	0	0
2512	Plywood & Veneer	10	2	10	3	0	0	0	0	0	0
2513	Joinery Work	0	0	0	0	0	0	-5	-1	-1	2
2521	Rattan Processing	0	0	0	0	0	0	-8	-3	-3	2
2522	Wooden Crates, Boxes, etc.	0	0	0	0	0	0	-3	-3	-3	2
2611	Wood Furniture	0	0	0	0	0	0	-2	-2	-2	2
2613	Metal Furniture	20	17	6	5	0	0	0	0	0	0
2721	Paper Containers	0	0	0	0	0	0	-4	-4	-4	2

(Table continues on the following page.)

Appendix Table 9.1 (continued)

SIC Code		Tariff/Export Subsidy		Implicit Tariff		Nominal Rate of Protection		Effective Rate of Protection (%)			Nominal Tariff on Inputs
								Balassa		Corden	
		Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Average	
32	Petroleum Products	0	0	0	0	0	0	0	0	0	0
3311	Bricks & Tiles	25	24	5	5	25	24	46	44	29	2
3340	Cement & Cement Additives	24	22	3	2	3	2	3	3	2	2
3350	Structure Cement/Concrete Products	10	10	5	5	5	5	-3	-3	-3	11
3399	Other Nonmetallic Products	5	2	2	1	2	1	1	1	1	2
3412	Iron Foundries	0	0	0	0	0	0	-1	-1	-1	2
3499	Other Basic Metal*	14	8	8	5	8	5	16	10	7	2
3510	Structural Metal Products	14	13	8	7	14	13	22	19	17	7
3520	Wire & Wire Products	18	14	10	7	10	7				
3541	Tin Cans, Tin Plate Articles	0	0	0	0	0	0	0	0	0	0
3549	Stamped, Pressed, Coated Metals	0	0	0	0	0	0	-4	-3	-3	2
3599	Other Metal Products*	5	3	3	2	3	2	3	2	2	2
3601	Indus. & Agri. Machinery and Parts	0	0	0	0	0	0	0	0	0	0
3604	Manufacture & Repair of Airconditioners & Refrigerators*	23	20	15	13	15	13	34	29	28	2

(Table continues on the following page.)

Appendix Table 9.1 (continued)

SIC Code		Tariff/Export Subsidy		Implicit Tariff		Nominal Rate of Protection		Effective Rate of Protection (%)			Nominal Tariff on Inputs
		Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Balassa Domestic Sales	Balassa Average	Corden Average	
2722	Ceremonial Paper	25	25	15	15	25	25	134	134	112	2
2799	Other Paper Products	9	5	5	2	5	2	5	3	3	2
2801	Printing & Publishing	0	0	0	0	0	0	-1	-1	-1	2
2802	Job Printing & Book Binding	0	0	0	0	0	0	-4	-3	-3	3
2803	Special Arts & Engraving	0	0	0	0	0	0	-5	-5	-5	4
2910	Leather Tanning	25	6	6	2	6	2	-50	-13	-12	14
2931/32	Leather Products	25	16	20	13	20	13	81	51	47	2
3023	Tire Retreading & Repair*	29	22	n.a.	n.a.	0	0	-0	0	0	0
3099	Other Rubber Products*	16	11	24	17	24	17	77	54	48	5
3121/23	Vegetable Oil & Coconut Oil	0	0	0	0	0	0	-27	-14	-13	2
3131	Paints & Enamels	25	22	25	22	25	22	129	112	102	2
3191	Soaps & Detergents	21	15	10	7	10	7	15	12	11	4
3193	Perfume, Cosmetics, Toilet Prep.	24	19	16	12	16	12	46	37	35	1
3195	Incense & Medicaments*	17	9	29	15	29	15	33	17	17	2
3199	Other Chemicals*	40	27	13	9	13	9	23	16	15	2

(Table continues on the following page.)

Appendix Table 9.1 (continued)

SIC Code		Tariff/Export Subsidy		Implicit Tariff		Nominal Rate of Protection		Effective Rate of Protection (%)			Nominal Tariff on Inputs
								Balassa		Corden	
		Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Domestic Sales	Average	Average	
3699	Other Manufacturing & Repair of Machinery	0	0	0	0	0	0	0	0	0	0
37	Electrical Machinery, Apparatus, Appliances*	26	12	16	8	16	8	21	10	9	2
3813	Shipbuilding & Repair	0	0	0	0	0	0	-1	-1	-1	2
3814	Building & Repairing of Wooden Boats	0	0	0	0	0	0	-2	-2	-2	2
3831/33	Manufacture & Assembly of Motor Vehicles*	7	4	7	4	7	4	8	5	5	4
3840	Motor Vehicle Repair	0	0	0	0	0	0	-7	-7	-7	7
3899	Other Manufacture of Transport Equipment*	0	0	4	4	0	0	-7	-7	-7	2
3940	Jewelry	0	0	0	0	0	0	-9	-9	-9	2
3994	Neon Signs & Advertisements	25	22	10	9	0	0	0	0	0	0
3995	Plastics*	25	21	12	11	12	11	34	29	26	2
3999	Other Misc. Manufactures	0	0	0	0	0	0	-3	-1	-1	2

*Includes at least one commodity under quantitative restriction

Appendix Table 10.1. *Taiwan: Nominal and Effective Protection Rates, by Sector, 1969*
(percent)

Appendix Table 10.1

Taiwan: Nominal and Effective Protection Rates by Sector 1969
(percentage)

Sector	Adjusted Tariff Rate	Nominal Protection		Effective Protection				Export Subsidy	Effective Subsidy			
				Balassa			Corden		Balassa			Corden
		D	A	E	D	A	A		E	D	A	A
1	8	0	0	-1	-6	-6	-5	4	2	-10	-9	-8
2	86	3	3	-4	0	0	0	4	0	-4	-4	-3
3	98	28	28	0	41	41	32	4	-4	36	36	29
4	68	0	0	-1	-4	-4	-4	4	2	-8	-7	-6
5	102	0	0	-1	-6	-5	-4	4	2	-10	-7	-5
6	65	0	0	0	-24	-23	-16	4	18	-27	-25	-18
7	45	7	7	0	10	10	8	4	10	6	6	5
8	39	0	0	-1	-4	-3	-3	4	1	-7	-6	-5
9	91	0	0	-4	-19	-13	-12	4	2	-22	-13	-11
10	37	0	0	-6	-6	-6	-5	4	2	-9	-9	-8
11	5	0	0	-3	-15	-5	-5	4	3	-18	-2	0
12	55	17	17	0	17	17	12	4	-4	12	12	8
13	57	0	0	0	-6	-6	-6	4	-4	-9	-9	-8
14	83	0	0	-8	-14	-14	-13	4	4	-17	-17	-16
15	18	0	0	-2	-8	-8	-7	4	1	-11	-11	-10
16	151	27	9	-40	400	126	13	4	62	381	183	16
17	108	0	0	-2	-40	-2	1	5	25	-42	26	18
18	177	56	51	5	-276	-251	514	4	-29	-269	-249	501
19	177	61	56	79	-1031	-945	455	4	-79	-995	-925	446
20	133	136	69	-19	2090	898	209	15	221	2007	998	235
21	45	19	19	76	-111	-109	85	4	-77	-111	-110	80
22	66	33	33	-114100	-315	-315	-255	4	109685	-307	-307	-251
23	125	30	27	-4	34	30	25	4	5	29	26	23
24	177	10	3	-1	75	22	14	4	29	68	41	26
25	75	0	0	0	-40	-37	-22	4	14	-43	-37	-23
26	78	50	30	-42	-1141	-18728	152	4	73	-1102	-19894	160
27	143	27	8	-7	23	7	3	4	39	19	30	12
28	70	16	11	-10	10	5	2	9	90	6	30	15
29	127	15	11	-4	-54	-40	-15	11	88	-56	-15	-7
30	122	26	18	-2	51	31	22	4	8	45	31	22
31	54	0	0	-1	-10	-8	-4	4	18	-13	-5	-3
32	74	4	1	-4	-16	-6	-4	4	17	-19	12	8
33	78	1	1	-1	-5	-3	-3	4	6	-8	-4	-3
34	73	10	9	-4	-14	-14	-6	7	47	-17	-14	-8
35	21	0	0	0	-15	-14	-12	4	3	-18	-17	-14
36	101	8	5	-2	-38	-24	-13	4	14	-40	-20	-11
37	70	33	18	-4	129	58	17	4	24	120	69	23
38	27	35	31	-51	705	540	84	4	78	674	544	89
39	48	48	43	-1	163	143	60	4	14	153	137	56
40	63	9	5	-1	-10	-6	-5	4	11	-13	-2	-1
41	60	28	23	-226	64	61	37	4	258	58	60	38
42	47	47	28	2	-813	-499	164	4	-82	-786	-515	170
43	48	24	23	-30	136	130	25	4	54	127	124	22
44	90	23	21	-3	57	52	18	4	27	51	49	16
45	16	0	0	-4	-12	-10	-8	5	5	-15	-12	-9
46	57	0	0	-11	-18	-18	-13	4	7	-21	-21	-16
47	94	46	27	-10	154	84	35	4	14	144	89	37
48	60	0	0	-1	-9	8	-7	4	4	-13	-11	-9
49	30	9	8	-3	-20	-18	-7	6	46	-23	-15	-8
50	46	20	13	-3	48	31	17	4	21	43	36	19
51	53	35	30	-22	219	180	42	4	54	207	183	41
52	68	3	2	-2	-43	-29	-22	4	8	-46	-27	-21
53	57	51	34	-3	182	121	60	4	15	171	119	60
54	29	8	6	0	-5	-3	-2	4	9	-8	3	-2
55	73	24	21	-1	27	23	16	4	10	22	20	14
56	40	40	12	-3	91	35	14	4	34	84	54	21
57	42	15	13	-2	10	8	4	4	18	5	7	3
58	11	11	8	-1	10	8	6	4	6	6	6	6
59	69	31	30	-13	90	86	26	4	38	83	81	23
60	57	60	32	-7	183	93	63	4	10	172	96	64
61	73	42	3	-3	140	6	3	4	15	131	22	10

(Table continues on the following page.)

Appendix Table 10.1 (continued)

Key to Sectors

01 Rice
02 Other common crops
03 Sugarcane
04 Crops for processing
05 Misc. horticultural crops
06 Hogs
07 Other livestock
08 Forestry
09 Fisheries
10 Coal and products
11 Metallic minerals
12 Crude petroleum
13 Natural gas
14 Salt
15 Nonmetallic minerals
16 Sugar
17 Canned foods
18 Tobacco
19 Alcoholic beverages
20 Monosodium glutamate
21 Wheat flour
22 Edible vegetable oil
23 Nonalcoholic beverages
24 Tea
25 Misc. foods
26 Artificial fiber
27 Artificial fabrics
28 Cotton fabrics
29 Woolen and worsted fabrics
30 Misc. fabrics, apparel, and accessories
31 Lumber
32 Plywood
33 Products of wood, bamboo, rattan
34 Pulp, paper, and paper products
35 Printing and publishing
36 Leather and products
37 Rubber and products
38 Chemical fertilizer
39 Medicines
40 Plastics and products
41 Petroleum products
42 Nonedible vegetable and animal oils
43 Misc. industrial chemicals
44 Misc. chemical manufactures
45 Cement
46 Cement products
47 Glass and products
48 Misc. nonmetallic mineral products
49 Steel and iron
50 Steel and iron products
51 Aluminum
52 Aluminum products
53 Misc. metallic products
54 Machinery
55 Household electrical appliances
56 Communication equipment
57 Other electrical apparatus and equipment
58 Shipbuilding
59 Motor vehicles
60 Other transport equipment
61 Misc. manufactures

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