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DISTORTIONS TO AGRICULTURAL INCENTIVES IN AFRICA

Editors

Kym Anderson • William A. Masters



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*Kym Anderson
and William A. Masters, Editors*



THE WORLD BANK
Washington, D.C.

© 2009 The International Bank for Reconstruction and Development / The World Bank

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Internet: www.worldbank.org

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1 2 3 4 12 11 10 09

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Cover design: Tomoko Hirata/World Bank.

Cover photo: Arne Hoel/World Bank Photo Library.

ISBN: 978-0-8213-7652-2

eISBN: 978-0-8213-7664-5

DOI: 10.1596/978-0-8213-7652-2

Library of Congress Cataloging-in-Publication Data

Distortions to agricultural incentives in Africa / edited by Kym Anderson and William A. Masters.

p. cm.

Includes bibliographical references and index.

ISBN 978-0-8213-7652-2 — ISBN 978-0-8213-7664-5 (electronic)

1. Agriculture—Economic aspects—Africa. 2. Agriculture and state—Africa. 3. Agricultural subsidies—Africa. 4. Africa—Economic policy. I. Anderson, Kym. II. Masters, William A.

HD2118.D57 2008

338.1'86—dc22

2008037334

DEDICATION

To the authors of the country case studies, for their narratives and for generating the time series of distortion estimates that underpin the studies.

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FOREWORD

One of every two people in Sub-Saharan Africa survives on less than \$1.25 a day. That proportion has changed little over the past three decades, unlike in Asia and elsewhere, so the region's share of global poverty has risen from one-tenth to almost one-third since 1980. About 70 percent of today's 400 million poor Africans live in rural areas and depend directly or indirectly on farming for their livelihoods. While that rural share was even higher in the past (for example, 75 percent in 1993), it means policies affecting the incentives for farmers to produce and sell farm products remain a major influence on the extent of Africa's poverty.

During the 1960s and 1970s, many African and other developing countries had in place pro-urban, anti-agricultural, and anti-trade policies, while many high-income countries restricted agricultural imports and subsidized their farmers. Both sets of policies harmed African farmers. Although progress has been made over the past two decades to reduce those policy biases, including the anti-agricultural bias in Africa, the extent of reform has not been systematically quantified. Nor has it been clear how many trade- and welfare-reducing price distortions remain in African agriculture, both within and between countries, and to what extent there continues to be an anti-trade bias within agriculture.

To help fill this lacuna, the World Bank launched a major research project in 2006 aimed at quantifying the changing extent of distortions to agricultural incentives since the 1950s. This volume is one of a series of four regional books that summarize the findings. By including most of the large African economies as case studies, the focus countries cover about 90 percent of the agricultural value added, farm households, total population, and total GDP of Sub-Saharan Africa. The Arab Republic of Egypt, the most populous and poorest country in North Africa, is also included.

The case studies help address questions such as the following: Where is there still a policy bias against agricultural production? To what extent are some farmers now being protected from import competition? What are the political economic forces behind the more-successful reformers, and how do they compare with those in less-successful countries where major distortions in agricultural incentives remain? How important have domestic political forces been in bringing about reform, as compared with international forces? What explains the cross-commodity pattern of distortions within the agricultural sector of each country? What policy lessons and trade implications can be drawn from these differing experiences with a view to ensuring better growth-enhancing and poverty-reducing outcomes in the study's focus countries and in the region's other (mostly smaller and poorer) economies?

In Africa, the anti-agricultural and anti-trade policy biases worsened during the 1960s and 1970s, and the policy reforms since then have been less dramatic and more sporadic than in Asia, which has contributed to Africa's rising share of global poverty. One of the continent's greatest achievements has been the phasing out of agricultural export taxes over the past quarter-century. However, alongside that, agricultural protection from import competition has limited the decline in anti-trade bias within the farm sector. That has added to the cost of living for net buyers of food, who constitute the majority of the poor who survive on less than \$1.25 a day: 30 percent of the poor live in urban areas, but a sizeable share of the other 70 percent are also net buyers of food, including farmers who grow cash crops for export.

The new empirical indicators summarized in these case studies provide a strong evidence-based foundation for assessing the successes and failures of policies of the past and for evaluating policy options for the years ahead. The analytical narratives reveal that the reforms to agricultural price and trade policies were sometimes undertaken unilaterally, but in other cases they were also partly in response to international pressures, including structural adjustment loan conditionality by international financial institutions in the 1980s.

The study is timely because the World Trade Organization (WTO) is in the midst of the Doha round of multilateral trade negotiations, and agricultural policy reform is one of the most contentious issues in those talks. To date, the countries of Africa have taken defensive positions in those negotiations. This has included a reluctance to reform policies that lead to high prices for staple foods, even though those policies may be harming those urban and rural poor who are net buyers of food. Available evidence suggests that problems of rural-urban poverty gaps have been alleviated in parts of Africa and Asia by some of the more-mobile members of farm households finding full- or part-time work off the farm

and repatriating part of their higher earnings to those remaining in farm households. Efficient ways of assisting any left-behind groups of poor (nonfarm as well as farm) households include public investment measures that have high social payoffs, such as in basic education and health and in rural infrastructure, as well as in agricultural research and development. As argued in the World Bank's *World Development Report 2008*, the latter also provides more sustainable and more equitable ways of securing domestic food supplies than artificially propping up prices.

Justin Yifu Lin
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ACKNOWLEDGMENTS

This book provides an overview of the evolution of distortions to agricultural incentives caused by price, trade, and exchange rate policies in a large sample of African countries. Following the introduction and summary chapter, it includes commissioned country studies of 16 individual African economies plus one covering the cotton-exporting countries of West and Central Africa. The chapters are followed by two appendixes: one provides the methodology used to measure the nominal and relative rates of assistance to farmers and the taxes and subsidies on food consumption; the other provides country and regional summaries of annual estimates of these rates of assistance. In addition to including the largest North African economy (the Arab Republic of Egypt), the studied countries account for about 90 percent of Sub-Saharan Africa's agricultural value added, farm households, total population, and total gross domestic product.

To the authors of the country case studies, who are listed on the following pages, we are extremely grateful for the dedicated way in which they delivered far more than we could have reasonably expected. Staff of the World Bank's Africa Department, especially Sector Manager Karen Brooks, provided generous and insightful advice and assistance throughout the project, including through participating in a Bank-wide seminar on the draft studies. So too did the World Bank's country directors of the studied countries when they cleared the working paper versions of each chapter. We have also benefited from the feedback provided by many participants at workshops and conferences in which drafts have been presented over the past year or so. Johanna Croser, Francesca de Nicola, Esteban Jara, Marianne Kurzweil, Signe Nelgen, Damiano Sandri, and Ernesto Valenzuela generously assisted in compiling material for the opening overview chapter, and Johanna Croser and Marie Damania assisted in the initial copyediting of the country chapters.

Our thanks extend to the project's Senior Advisory Board, whose members have provided sage advice and much encouragement throughout the planning and implementation stages of the project. The Board comprises Yujiro Hayami, Bernard Hoekman, Anne Krueger, John Nash, Johan Swinnen, Stefan Tangermann, Alberto Valdés, Alan Winters, and, until his untimely death in 2008, Bruce Gardner.

Our thanks go also to the Development Research Group of the World Bank and to the trust funds of the governments of Ireland, the Netherlands, and the United Kingdom for financial assistance. This support made it possible to include this set of economies in a wider study that covers more than 20 other developing countries, 18 economies in transition from central planning, and 20 high-income countries. Three companion volumes examine case studies of other emerging economies in a similar way and for a similar time period (back to the mid-1950s or early 1960s, except for the transition economies). These World Bank publications cover East and South Asia (coedited by Kym Anderson and Will Martin), Latin America and the Caribbean (coedited by Kym Anderson and Alberto Valdés), and Eastern Europe and Central Asia (coedited by Kym Anderson and Johan Swinnen). A global overview volume, edited by Kym Anderson, will be published in 2009.

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November 2008

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ABBREVIATIONS

ACP	African, Caribbean, Pacific
BAT	British American Tobacco
CET	common external tariff
cif	cost, insurance, and freight
Comecon	Council for Mutual Economic Assistance
COMESA	Common Market for Eastern and Southern Africa
CTE	consumer tax equivalent
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization
fob	free on board
GATT	General Agreement on Tariffs and Trade
IMF	International Monetary Fund
ISIC	International Standard Industrial Classification
MFN	most favored nation
NGO	nongovernmental organization
NPS	non-product-specific (assistance)
NRA	nominal rate of assistance
OECD	Organisation for Economic Co-operation and Development
OLS	ordinary least squares
OPEC	Organization of the Petroleum Exporting Countries
OPV	open pollinated variety
PPP	purchasing power parity
PSF	producer support estimate
RCA	revealed comparative advantage
REER	real effective exchange rate
RER	real exchange rate

xxx **Abbreviations**

RERmis	real exchange rate misalignment
RRA	relative rate of assistance
SADC	Southern Africa Development Community
TBI	trade bias index
VAT	value added tax
WCA	western and central Africa
WTO	World Trade Organization

Note: All dollar amounts are U.S. dollars (US\$) unless otherwise indicated.

The Focus Economies of Africa



PART I

INTRODUCTION

INTRODUCTION AND SUMMARY

Kym Anderson and William A. Masters

In the 1960s and 1970s, many African governments had macroeconomic, sectoral, and trade policies that increasingly favored urban employees at the expense of farm households and favored the production of importable goods at the expense of exportables (Krueger, Schiff, and Valdes 1988, 1991; Thiele 2004). Similar biases were prevalent elsewhere but rarely to the same extent as in Africa. The magnitude of pro-urban (antiagricultural) and also pro-self-sufficiency (antitrade) intervention matters greatly for economic development, because agriculture is the main employer for the poor and in Africa is often a key export sector. Changes in the magnitude of these biases could help explain Africa's development experience, including the continent's slow pace of poverty alleviation and economic growth. Indeed, since the 1980s, much progress has been made in reducing the antiagricultural and antitrade biases of policy in Africa, and these changes have been associated with faster economic growth and poverty alleviation. However, many price distortions remain. With 60 percent of Sub-Saharan Africa's workforce still employed in agriculture and more than 80 percent of the region's poorest households depending directly or indirectly on farming for their livelihoods (Chen and Ravallion 2007; World Bank 2007), agricultural and trade policies remain key influences on the pace and direction of change in Africa.

This volume summarizes a set of case studies measuring distortions within and across countries over time. It is part of a global research project seeking to improve understanding of agricultural policy interventions and reforms in Asia, Europe's transition economies, and Latin America and the Caribbean as well as Africa.¹ We make no attempt to summarize the voluminous literature on policy and economic growth in Africa (the most recent major continental study being

Ndulu et al. 2008), let alone the literature dealing with public investment or economic growth strategies more broadly (addressed recently by the Commission on Growth and Development 2008). Our goals are more narrowly defined. One purpose of the project is simply to compare quantitative indicators of past and recent agricultural price policies. A second objective is to help describe the political economy behind these interventions in various national settings. A third purpose is to use this evidence to explore the prospects for further policy reforms and their potential effects.

The foundation of this project is a new set of annual time series estimates for protection and taxation of farmers over the past half century. Comparisons over time, across commodities, and among countries are used to help address such questions as: Where is there still a policy bias against agricultural production? Are some developing-country food producers that were once taxed now being protected from import competition, along the lines of such policy transitions seen earlier in Europe and Northeast Asia?

Beyond the data themselves, what political and economic circumstances can help explain the policies chosen by governments? What explains the pattern of distortions within the agricultural sector of each country? What are the political economy forces behind reform, and how do successful reformers differ from country to country? In particular, how important are domestic political factors relative to international forces, such as loan conditionality, multilateral trade agreements through the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO), and regional integration agreements? How has the balance of forces shifted over time?

Looking forward, our goal is to draw appropriate lessons from past experience, lessons that can be used to facilitate the adoption of more growth-enhancing and poverty-reducing policies in Africa and elsewhere. The study is timely for at least four reasons. One immediate use for the findings is in trade negotiations. African and other developing countries have been more engaged in the WTO's Doha round of multilateral trade negotiations than in any previous GATT round, and the resulting diversity of interests has made it more difficult for WTO members to reach consensus. More information on agricultural and trade policies in these countries can inform dialogue between members. More information can also assist African countries seeking to position themselves favorably in preferential trade negotiations, notably the new Economic Partnership Agreements with the European Union. Another immediate need is for policies to respond to changing technologies, such as the information, communication, agricultural-biotechnology, and supermarket revolutions. A third source of urgency is to meet the United Nations–encouraged Millennium Development Goals by 2015, with agricultural policy being central to the alleviation of hunger and poverty. And last but not

least, the study is timely because world food prices spiked in 2007–08 at very high levels and governments in some developing countries, in their panic to deal with the inevitable protests from consumers, have reacted in far from optimal ways. Such spikes have occurred in the past, most notably in 1973–74, and lessons about what policy responses work better than others can be drawn from that set of experiences.

Including Africa in this study is crucial for several reasons. First, the continent is home to many of the world's poorest people. In 2006, Sub-Saharan Africa accounted for less than 2 percent of global gross domestic product (GDP) and exports and just 4 percent of agricultural GDP, but it also accounted for 12 percent of the world's farmers, 16 percent of agricultural land, and 28 percent of those living on less than \$1 a day (World Bank 2008). Second, it is the region where agricultural growth has been slowest over the past half-century, especially on a per capita basis. And third, it is where sectoral and macroeconomic (including exchange rate) policies have been most heavily interventionist and slowest to reform, dampening the contribution of market incentives to economic growth. There is thus much to be learned from examining the policy history of the region, and there is great potential for poverty alleviation if market-friendly, growth-enhancing policies were to be adopted and the recent large increase in development assistance funds were to be used wisely to complement and strengthen market forces.

The African part of this study is based on a sample of 21 developing countries. It includes the Arab Republic of Egypt, the largest and poorest country in North Africa; plus five countries of eastern Africa (Ethiopia, Kenya, Sudan, Tanzania, and Uganda); five countries in southern Africa (Madagascar, Mozambique, South Africa, Zambia, and Zimbabwe); five large economies in western Africa (Cameroon, Côte d'Ivoire, Ghana, Nigeria, and Senegal); and five smaller economies of West and Central Africa for which cotton is a crucial export (Benin, Burkina Faso, Chad, Mali, and Togo, for which we estimate price distortions only for cotton and four nontraded food staples). In 2000–04, these economies (leaving aside Egypt) together accounted for around 90 percent of the agricultural value added, farm households, total population, and total GDP of Sub-Saharan Africa. Estimates of distortions are provided for as many years and products as data permit over the past five decades (an average of 43 years), averaging nine crop and livestock products a country and covering about 70 percent of the aggregate value of agricultural production in these countries. The time series, product, and country coverage greatly exceed that of the earlier study by Krueger, Schiff, and Valdes (1991), which focused on just three to five crops during the 1960–84 period in only two North African and two Sub-Saharan African countries (Egypt and Morocco, and Ghana and Zambia).

The 21 focus economies in Africa accounted for only 1.3 percent of worldwide GDP but 11 percent of the world's farmers in 2000–04. These and related shares are detailed in table 1.1, which reveals the considerable diversity within the region in stages of economic development, resource endowments, trade specialization, poverty incidence, and income inequality. The countries are also very diverse in their political and social development and thus provide a rich sample for comparative study.

The extent of poverty decline in Sub-Saharan Africa since 1981 has been disappointing relative to other developing-country regions. The number of people in Sub-Saharan Africa living on less than \$1 a day (measured in 1993 purchasing power parity) grew from 168 million in 1981 to 252 million by 1993 and to 298 million by 2004. As a share of the population, the number of people in such extreme poverty has declined over the past decade from a peak of 48 percent in 1996 to 41 percent by 2004—but that is only marginally below the 42 percent level of 1981. More than two-thirds of that recent decline in poverty incidence has been in rural areas, while most of the rest is explained by the rural poor moving to urban centers (where many are still very poor). The African experience contrasts strongly with that in Asia, where even in South Asia, the proportion of the population living on less than \$1 a day has fallen from one-half to less than one-third (table 1.2).

Policy choices have played an important role in the rates of economic growth, structural change, and poverty alleviation observed in Africa. Many countries had increasingly severe antiagricultural and antitrade biases in the 1960s and 1970s, with subsequent reforms that varied widely in their starting dates, speed of execution, and extent of policy change. The switch to policies that are less biased against farmers and trade began in some countries by the late 1970s but in many others only in the 1980s or even later—and the transition is still going on, often in fits and starts and even with the occasional reversal (the most notable recent example being Zimbabwe). Agricultural price distortions are not the only target of policy reform, of course, but they are a key aspect of economic policy in most African countries.

This chapter begins with a brief summary of economic growth and structural changes in the region since the 1950s and of agricultural and other economic policy developments as they affected the farm sector at the time of, and in various stages after, independence from colonial powers. It then introduces the methodology used by the authors of the individual case studies to estimate the nominal rate of assistance (NRA), the corresponding consumer tax equivalent (CTE) facing the buyers of agricultural products, the relative rate of assistance (RRA) between the farm and nonfarm sectors, and the international trade bias index (TBI). The chapter subsequently provides a synopsis of the empirical results detailed in the country studies in this volume (and tabulated in brief in appendix

Table 1.1. Key Economic and Trade Indicators, 21 African Focus Countries, 2000–04

Country or subregion	Share of world, %			Index, world = 100			Agricultural trade specialization index ^b	Poverty incidence ^c	Gini index of per capita income ^d
	Population	Total GDP	Agricultural GDP	GDP per capita	Agricultural land per capita	RCA ^a			
Benin	0.12	0.01	0.09	7	55	1,034	—	31	39
Burkina Faso	0.19	0.01	0.09	5	111	953	—	29	40
Cameroon	0.25	0.03	0.38	13	74	445	—	15	45
Chad	0.14	0.01	0.07	5	695	—	—	—	—
Côte d'Ivoire	0.28	0.04	0.21	12	139	722	—	18	48
Egypt, Arab Rep. of	1.13	0.26	1.11	23	6	175	—	2	34
Ethiopia	1.08	0.02	0.23	2	58	958	—	12	30
Ghana	0.33	0.02	0.2	6	88	748	—	17	41
Kenya	0.52	0.04	0.29	8	103	636	—	12	43
Madagascar	0.28	0.01	0.1	5	202	670	0.94	63	47
Mali	0.2	0.01	0.1	5	353	624	—	39	40
Mozambique	0.3	0.01	0.08	4	324	359	-0.03	30	47
Nigeria	1.98	0.15	1.09	8	73	3	—	71	44
Senegal	0.17	0.02	0.09	10	94	444	—	13	41
South Africa	0.73	0.42	0.39	59	275	134	0.52	9	58
Sudan	0.55	0.05	0.5	8	490	209	—	—	—
Tanzania	0.58	0.03	0.33	5	166	800	0.73	56	35
Togo	0.09	0	0.05	5	80	407	—	—	—
Uganda	0.42	0.02	0.15	4	60	938	0.8	83	46
Zambia	0.18	0.01	0.07	7	398	194	0.35	60	51
Zimbabwe	0.21	0.04	0.14	18	200	602	0.83	62	50
African focus countries	9.73	1.21	5.74	13	145	—	—	—	—
All Sub-Saharan Africa	9.37	0.98	4.93	10	164	—	0.55	41	—
All North Africa	2.34	0.70	2.81	30	84	—	-0.78	—	—
All Africa	11.71	1.67	7.74	14	148	—	0.20	32	—

Source: Sandri, Valenzuela, and Anderson 2007, which draws on World Development Indicators Database 2007.

Note: — = no data are available.

a. The index of revealed comparative advantage (RCA) for agriculture and processed foods (this case) is the share of agriculture and processed food in national exports as a ratio of the worldwide sectoral share of global exports.

b. The index of primary agriculture trade specialization is the ratio of net exports to the sum of the exports and imports of agricultural and processed food products (the world average = 0.0).

c. The percentage of the population living on less than \$1 a day in 2004, from Chen and Ravallion 2007.

d. The Gini index is for the most recent year available between 2000 and 2004.

Table 1.2. Poverty in Africa, Asia, and the World, 1981–2004

Region	1981	1990	1996	2004
Number of people (millions)				
Sub-Saharan Africa	168	240	286	298
East Asia	796	476	279	169
South Asia	455	479	453	446
World	1,470	1,248	1,109	969
Percent of population				
Sub-Saharan Africa	42	47	48	41
East Asia	58	30	16	9
South Asia	50	43	36	31
World	40	29	23	18

Source: Chen and Ravallion 2007.

B and more fully in Valenzuela et al. 2007), without attempting to survey the myriad policy changes that are discussed in more detail in the following chapters. The final sections summarize what we have learned and draw out implications of the findings, including those for poverty and inequality and for possible future directions of policies affecting agricultural incentives in Africa.

Growth and Structural Changes in Africa

The recent report of the Commission on Growth and Development (2008) notes that 13 economies have had sustained growth in real per capita income of more than 7 percent for at least 25 consecutive years since World War II. Nine of those are East Asian and only 1 is African, namely, tiny Botswana (population: 2 million). Between 1980 and 2004, annual per capita GDP for our 21 focus countries of Africa grew at just 0.7 percent, half the global average of 1.4 percent and a small fraction of Asia's 5.5 percent, so per capita incomes in Africa have been diverging away from those of richer countries, especially those in Asia. Agricultural GDP growth was faster in Africa than for the world as a whole (3.2 compared with 2.0 percent a year) but only marginally so when expressed on a per capita basis (0.6 compared with 0.5 percent). In the earlier 1965–84 period, Africa's agricultural GDP growth rate was only 1.5 percent (World Bank 1986).

Within Africa, economic growth and structural change experiences across countries are quite diverse (table 1.3). Over time, Africa's export volumes grew at relatively slow rates compared with the global average of 6.1 percent (last column of table 1.3), causing the region's share of global exports to halve. However, as economies have gradually opened up, the share of exports in GDP has reversed its decline and has begun rising in several African countries (table 1.4).

Table 1.3. Growth of Real GDP and Exports, 21 African Focus Countries, 1980–2004*(at constant 2000 prices, percent per year, trend based)*

Country or subregion	Agriculture	Industry	Services	Total GDP	GDP per capita	Export volume
Benin	5.4	4.3	2.6	3.7	0.3	0.6
Burkina Faso	3.8	2.5	4.0	3.7	0.8	1.2
Cameroon	3.4	0.4	−0.2	1.2	−1.4	2.5
Chad	3.7	4.3	3.2	3.9	0.9	3.5
Egypt, Arab Rep. of	3	4.7	5.1	4.6	2.4	5.0
Ethiopia	1.8	1.3	4.5	2.9	0.2	4.7
Ghana	2.6	3.6	6.6	4.1	1.3	7.0
Kenya	2.3	2.5	3.5	3.0	−0.1	4.1
Madagascar	2.1	1.6	1.3	1.6	−1.4	2.1
Mali	3.3	5.6	2.5	3.3	0.6	8.1
Mozambique	4.2	7.7	6.4	4.4	2.3	7.7
Nigeria	3.7	1.6	5.6	3.1	0.4	3.0
Senegal	2.1	4	2.9	2.9	0.2	4.5
South Africa	1.4	0.5	2.3	1.7	−0.5	3.7
Sudan	4.9	4.6	3.5	4.3	1.9	4.3
Tanzania	3.6	5.0	4.0	3.8	1.1	6.2
Togo	3.9	1.7	1.2	2.1	−1.1	0.3
Uganda	3.6	9.3	6.9	5.9	2.4	8.9
Zambia	2.5	−0.4	1.4	1.0	−1.6	1.1
Zimbabwe	2.3	0.3	2.3	1.9	−0.6	6.0
African focus countries	3.2	2.6	3.5	3.1	0.7	4.4
All Sub-Saharan Africa	3.6	1.7	2.9	2.7	0.1	—
All North Africa	—	—	—	3.9	1.8	—
All Africa	—	—	—	3.7	—	—

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Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

Note: — = no data are available.

Table 1.4. Exports as a Share of GDP, 21 African Focus Countries, 1975–2004
(percent)

Country or subregion	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Benin	8	21	21	27	27	22
Burkina Faso	6	7	7	6	—	9
Cameroon	25	13	13	20	25	—
Chad	11	14	14	13	—	—
Egypt, Arab Rep. of	22	22	22	24	16	18
Ethiopia	—	9	9	7	14	18
Ghana	32	19	19	19	28	40
Kenya	28	23	23	31	24	24
Madagascar	15	15	15	17	22	24
Mali	12	15	15	18	24	29
Mozambique	—	5	5	13	15	26
Nigeria	35	37	37	46	42	42
Senegal	33	24	24	22	30	29
South Africa	31	23	23	22	23	27
Sudan	9	5	5	5	7	15
Tanzania	—	9	9	14	17	17
Togo	27	29	29	25	33	35
Uganda	—	7	7	7	11	13
Zambia	40	36	36	31	32	24
Zimbabwe	22	23	23	26	—	—
African focus countries	—	21	21	23	—	—
All Sub-Saharan Africa	—	21	21	23	—	—
All North Africa	38	23	23	28	—	—
All Africa	—	22	22	25	—	—

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

Note: — = no data are available.

Slow economic growth has allowed only modest restructuring of Africa's economies away from agriculture and toward other activities. In nearly three-quarters of the focus countries, the farm sector's share of GDP is still above 25 percent, the same share as in the later 1980s (table 1.5). The share of overall employment accounted for by farming activities has fallen but generally remains above 50 percent (table 1.6), much higher than the GDP shares. These data underscore the relatively low incomes of farmers and hence the continued importance of agricultural prices for social welfare.

Agriculture's share of merchandise exports (table 1.7) has declined at least a little in virtually all African countries. That decline is partly because of rises in other primary exports such as petroleum in Sudan; partly because of growth in exports of manufactured goods in, for example, Kenya, Madagascar, and Senegal; and partly because production is increasingly consumed locally. The declining relative importance of farm exports has been less rapid in Africa than in the rest of the world, however, as shown by the rise in the index of revealed agricultural comparative advantage (defined as the share of agriculture and processed food in national exports as a ratio of the share of such products in worldwide merchandise exports) in most of the focus countries (table 1.8). The exceptions have newly exploited mineral or energy deposits. The overall trend is a slight decline in the export orientation of primary farm production. In the 1960s, the region was 120 percent self-sufficient in farm products, but since then, that indicator has declined to around 105 percent. The share of exported farm production has fallen from nearly 20 percent to just 8 percent, and the share of imports in domestic consumption of farm products has doubled, from 2 percent to 4 percent (table 1.9).

The trends in growth and development described here are closely linked to the agricultural policies pursued by African governments. To measure these policies in a comparable way, a common methodology was adopted by the authors of the country case studies in this volume (and its companion volumes; see note 1). A summary of that methodology follows, and further details can be found in Anderson et al. (2008), which is reproduced as appendix A in this book.

Methodology for Measuring Rates of Assistance and Taxation

The nominal rate of assistance is defined as the percentage by which government policies have raised gross returns to farmers above what they would have been without the government's intervention. Similarly, the consumer tax equivalent is the percentage by which policies have raised prices paid by consumers of agricultural outputs. Negative values imply net taxation of farmers or subsidies to consumers. The NRA and the CTE will be identical if the sole source of government

Table 1.5. Sectoral Shares of GDP, 21 African Focus Countries, 1965–2004
(percent)

Country or subregion	Agriculture				Industry				Services			
	1965–69	1975–79	1985–89	2000–04	1965–69	1975–79	1985–89	2000–04	1965–69	1975–79	1985–89	2000–04
Benin	42	33	34	36	11	14	13	14	48	53	52	50
Burkina Faso	34	29	28	32	21	23	21	18	45	48	51	50
Cameroon	32	31	23	43	20	19	30	17	49	51	46	40
Chad	38	37	33	40	13	13	14	14	49	49	53	46
Egypt, Arab Rep. of	25	24	19	15	24	27	27	32	51	49	54	53
Ethiopia	—	—	47	41	—	—	13	9	—	—	40	50
Ghana	43	56	48	36	19	16	17	25	38	29	35	39
Kenya	33	32	27	26	17	17	16	15	50	51	57	59
Madagascar	22	29	31	27	13	15	12	14	65	57	57	59
Mali	59	55	42	34	10	10	15	24	32	36	43	42
Mozambique	—	—	44	21	—	—	18	26	—	—	39	52
Nigeria	49	29	36	25	12	33	32	48	39	38	32	27
Senegal	25	26	21	18	12	15	18	20	63	59	61	62
South Africa	9	6	5	3	36	40	38	29	55	54	57	68
Sudan	36	34	33	39	14	12	16	20	50	54	52	41
Tanzania	—	—	—	41	—	—	—	15	—	—	—	44
Togo	44	29	33	39	22	23	22	20	34	49	45	41
Uganda	46	71	53	31	12	6	10	19	41	22	37	50
Zambia	12	15	15	20	57	40	44	24	31	45	41	57
Zimbabwe	20	16	15	14	28	31	29	19	52	53	55	67
African focus countries	—	—	—	17	—	—	—	29	—	—	—	54
All Sub-Saharan Africa	—	—	—	18	—	—	—	28	—	—	—	54
All North Africa	18	12	13	—	36	46	39	—	47	42	49	—
All Africa	—	—	—	—	—	—	—	—	—	—	—	—

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

Note: — = no data are available.

Table 1.6. Agriculture's Share in Employment, 21 African Focus Countries, 1965–2004*(percent)*

Country or subregion	1965–69	1975–79	1985–89	2000–04
Benin	82	71	65	52
Burkina Faso	92	92	92	92
Cameroon	86	77	71	58
Chad	93	89	85	74
Egypt, Arab Rep. of	63	58	45	33
Ethiopia	—	—	—	82
Ghana	61	61	60	56
Kenya	86	83	80	75
Madagascar	85	82	79	74
Mali	93	90	87	80
Mozambique	87	85	84	81
Nigeria	72	59	46	32
Senegal	83	81	78	73
South Africa	33	21	15	9
Sudan	81	74	70	60
Tanzania	91	87	85	80
Togo	76	70	66	59
Uganda	91	88	85	79
Zambia	81	77	75	68
Zimbabwe	78	74	69	62
Africa focus countries	—	—	—	56
All Sub-Saharan Africa	—	—	—	61
All North Africa	62	54	41	30
All Africa	—	—	—	56

Sources: Sandri, Valenzuela, and Anderson 2007; FAOSTAT Database 2007.

Note: — = no data are available.

intervention is a trade measure and if the two are measured at the same point in the value chain, but in general some domestic producer or consumer taxes or subsidies will differentiate them.²

The intended use of the NRAs and the CTEs influences the methodology needed to estimate them. This project uses them for three purposes. One is simply to compare the net effect of policies on prices and incentives across a wide range of commodities, countries, and years. For this purpose, the methodology needs to be both simple and flexible. Another purpose is to allow aggregation to indicate the total extent of transfer to (or from) farmers and consumers resulting from agricultural price policies, for which appropriate weights and denominators are

Table 1.7. Sectoral Shares in Merchandise Exports, 21 African Focus Countries, 1965–2004
(percent)

Country	Agriculture and processed food				Other primary				Other goods			
	1965–69	1975–79	1985–89	2000–04	1965–69	1975–79	1985–89	2000–04	1965–69	1975–79	1985–89	2000–04
Benin	88	84	—	92	4	2	—	0	8	11	—	8
Burkina Faso	95	92	—	85	1	0	—	2	4	8	—	13
Cameroon	80	81	57	40	14	13	26	55	6	6	16	5
Chad	96	83	—	—	2	9	—	—	1	8	—	—
Egypt, Arab Rep. of	71	44	20	16	6	30	50	45	24	26	30	33
Ethiopia	—	—	—	86	—	—	—	2	—	—	—	12
Ghana	80	83	—	67	17	14	—	18	1	2	—	15
Kenya	—	65	71	57	—	20	16	21	—	15	13	23
Madagascar	87	83	80	60	6	10	9	6	7	7	10	33
Mali	97	91	99	55	1	0	—	8	2	9	1	36
Mozambique	—	—	—	32	—	—	—	62	—	—	—	5
Nigeria	60	6	3	0	37	94	96	98	2	0	0	2
Senegal	83	61	49	40	9	28	26	23	8	12	25	36
South Africa	—	26	—	12	—	20	—	25	—	35	—	58
Sudan	98	96	93	19	1	3	1	77	1	1	6	3
Tanzania	—	83	91	71	—	4	—	10	—	13	8	18
Togo	57	37	41	36	36	55	50	16	7	7	8	48
Uganda	—	97	—	84	—	3	—	7	—	0	—	10
Zambia	3	1	—	17	97	98	—	69	1	1	—	14
Zimbabwe	—	—	51	53	—	—	19	19	—	—	29	28

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

Note: — = no data are available.

Table 1.8. Index of Revealed Comparative Advantage in Agriculture and Processed Food, 21 African Focus Countries, 1965–2004

(world = 1.0)

Country	1965–69	1975–79	1985–89	2000–04
Benin	3.5	4.5	—	10.3
Burkina Faso	3.8	4.7	—	9.5
Cameroon	3.2	4.2	3.9	4.5
Chad	3.8	4.1	—	—
Egypt, Arab Rep. of	2.8	2.3	1.4	1.8
Ethiopia	—	—	—	9.6
Ghana	3.2	4.3	—	7.5
Kenya	—	3.4	4.8	6.4
Madagascar	3.4	4.3	5.4	6.7
Mali	3.8	4.7	6.9	6.2
Mozambique	—	—	—	3.6
Nigeria	2.3	0.3	0.2	0
Senegal	3.3	3.1	3.3	4.4
South Africa	—	1.3	—	1.3
Sudan	3.8	5	6.2	2.1
Tanzania	—	4.3	6	8
Togo	2.2	1.9	2.8	4.1
Uganda	—	4.8	—	9.4
Zambia	0.1	0.1	—	1.9
Zimbabwe	—	—	3.3	6

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

Note: See table 1.1 for a definition of the RCA. — = no data are available.

needed. This function is similar in spirit to the producer and consumer support estimates put out by the Organisation for Economic Co-operation and Development (OECD 2007) but with important differences in implementation as outlined below. And the third purpose is to enable economic modelers to use the NRAs and CTEs in policy simulation models; to do so, modelers must be able to allocate each distortion to a particular policy instrument such as import tariffs, export taxes, or domestic producer or consumer taxes or subsidies.

Estimating the NRA or the CTE for an individual industry requires specialist knowledge of that sector, particularly in countries where trade costs are high, pass-through along the value chain is affected by imperfect competition, and markets for foreign currency have been distorted at various times and to varying degrees in the past. Specialist knowledge is also needed to assess how policy is

Table 1.9. Export Orientation, Import Dependence, and Self-Sufficiency in Primary Agricultural Production, 16 African Focus Countries, 1965–2004

(percent at undistorted prices)

a. Exports as a share of production

Country	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Cameroon	11	14	16	23	29	33	20	21	17
Côte d'Ivoire	48	44	42	39	50	61	55	60	59
Egypt, Arab Rep. of	17	15	15	9	7	5	2	2	3
Ethiopia	—	—	—	—	—	—	1	3	2
Ghana	46	42	43	45	27	31	17	16	18
Kenya	35	40	44	46	43	50	44	49	45
Madagascar	—	—	—	14	7	3	13	7	30
Mozambique	8	8	10	11	8	7	6	7	8
Nigeria	10	12	7	6	2	2	1	1	1
Senegal	24	18	4	7	5	2	5	6	4
South Africa	15	14	16	27	26	20	11	6	10
Sudan	24	22	21	15	9	7	5	6	3
Tanzania	—	—	—	18	18	16	16	11	7
Uganda	29	33	29	24	21	27	8	10	3
Zambia	11	13	7	3	2	4	4	6	14
Zimbabwe	63	36	43	37	43	41	52	53	43
African focus countries	19	18	17	17	12	11	8	8	8

b. Imports as a share of apparent consumption

Country	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Cameroon	0	0	0	0	0	0	0	0	0
Côte d'Ivoire	3	0	0	0	0	0	1	1	1
Egypt, Arab Rep. of	6	6	6	14	22	20	15	16	14
Ethiopia	—	—	—	—	—	—	1	1	2
Ghana	3	3	0	1	1	0	0	0	0
Kenya	13	10	11	4	6	6	10	10	12
Madagascar	—	—	—	5	6	14	35	11	28
Mozambique	1	2	1	1	1	3	4	4	3
Nigeria	0	0	0	0	1	1	0	0	1
Senegal	2	2	3	0	0	0	0	1	0
South Africa	0	0	0	0	0	0	0	1	1
Sudan	4	2	5	4	4	3	2	1	3
Tanzania	—	—	—	1	4	1	1	4	4
Uganda	0	0	0	0	1	1	1	1	1
Zambia	2	2	7	2	8	5	11	9	5
Zimbabwe	2	1	1	0	2	0	12	6	9
African focus countries	2	2	2	4	5	4	4	4	4

c. Self-sufficiency ratio

Country	1961– 64	1965– 69	1970– 74	1975– 79	1980– 84	1985– 89	1990– 94	1995– 99	2000– 04
Cameroon	113	117	119	130	141	150	125	126	120
Côte d'Ivoire	186	178	173	166	206	268	223	251	253
Egypt, Arab Rep. of	113	110	110	94	84	85	87	86	89
Ethiopia	—	—	—	—	100	100	101	102	100
Ghana	182	172	181	181	138	146	120	120	122
Kenya	135	153	162	182	166	192	165	178	163
Madagascar	118	117	119	137	135	125	112	106	110
Mozambique	—	—	—	114	101	89	74	95	141
Nigeria	111	113	107	106	101	101	101	101	101
Senegal	129	121	100	108	105	102	105	106	104
South Africa	107	107	110	111	107	105	102	103	105
Sudan	128	125	121	114	106	105	103	104	100
Tanzania	—	—	—	121	118	119	117	108	103
Uganda	140	149	142	133	126	138	108	110	103
Zambia	110	113	101	101	94	99	92	97	113
Zimbabwe	264	161	176	160	174	170	301	204	169
African focus countries	120	119	117	116	107	108	104	105	105

Sources: Compiled using project estimates of total agricultural production valued at undistorted prices; Food and Agriculture Organization (FAO) Agricultural Trade Database 2007.

Note: — = no data are available.

actually implemented. Most distortions in markets for tradable goods come from trade measures, such as a tariff (or occasionally a subsidy) imposed on the cif (cost, insurance, and freight) import price or an export tax imposed on the fob (free on board) price at the country's border, or quantitative restrictions on trade. These are captured in the NRA and the CTE at the point in the value chain where the product is first traded. To estimate the NRA for a typical farmer, authors of the country studies estimated or guessed the extent of pass-through back to the farm-gate and added any domestic subsidies the farmer received for his output. To obtain the CTE for a typical consumer, they also added any product-specific domestic consumer taxes or subsidies to the distortion from border prices. Note that the NRA and the CTE differ from the OECD's producer and consumer support estimates in that the latter are expressed as a percentage of the distorted price and hence are lower (for positive protection rates) than the former, which are expressed as percentages of the undistorted price.³

We decided against seeking estimates of the more complex effective rate of assistance even though it is, in principle, a better partial-equilibrium, single

measure of distortions to producer incentives than the nominal rate. Making those complex estimates requires knowing each product's value added and various intermediate input shares of output. Such data are not available for most developing countries even every few years, let alone for every year in the long time series that is the focus of this study. And in most countries, distortions to farm inputs are very small compared with distortions to farm output prices. But where product-specific distortions to input costs are significant, they are captured by estimating their equivalence in terms of a higher output price and including that in the NRA for individual agricultural industries wherever data allow (as is also done as part of the calculation by the OECD of its producer support estimate). Any non-product-specific distortions, including distortions to farm input prices, are also added into the estimate for the overall sectoral NRA for agriculture as a whole.

NRA and CTE estimates were made for each of the country's major farm products, in an attempt to cover at least 70 percent of the total gross value of farm production at undistorted prices. This target degree of coverage is similar to that for the OECD's producer support estimates. Unlike the OECD, however, in this project we do not routinely assume that the nominal assistance for covered products applies equally to noncovered farm products, because in developing countries the agricultural policies affecting the noncovered products are often very different from those for the chosen covered products. For example, nontradables among noncovered farm goods (often highly perishable or low-valued products relative to their transport cost) are often not subject to direct distortionary policies whereas covered nontradables often are. The authors of the country case studies were asked to provide three sets of "guesstimates" of the NRAs for noncovered farm products, one each for the import-competing, exportable, and nontradable subsectors. Weighted averages for all agricultural products were then generated, using the gross values of production at unassisted prices as weights. For countries that also provide non-product-specific agricultural subsidies or taxes (assumed to be shared on a pro rata basis between tradables and nontradables) or assistance decoupled from production, such net assistance is then added to product-specific assistance to obtain an NRA for total agriculture and also for tradable agriculture for use in generating the relative rate of assistance (defined below).

How best to present regional aggregate NRA and RRA estimates depends on the purpose for which the averages are required. We generate a weighted average NRA for covered products for each country by multiplying each NRA by that product's share of the gross value of production, valued at the farmgate equivalent undistorted price.⁴ To obtain the NRA for all agriculture, we then add the NRA for noncovered products and any non-product-specific assistance to farmers. When it comes to averaging across countries, each polity is an observation of interest, so a simple average is meaningful for the purpose of political economy analysis.

For other purposes, however, a value-weighted average is appropriate. Finally, we compute and use a weighted average that includes only the tradables part of agriculture—including those industries producing products such as milk and sugar that require only light processing before they can be traded—by assuming that its share of non-product-specific assistance equals its weight in the total. We denote this measure for tradable agriculture as $NRAag^t$.

In addition to these average NRAs, it is important to provide a measure of dispersion or variability of the nominal rate of assistance across products. The welfare cost of a distortion varies exponentially with its size, so that a set of dispersed tariffs is more costly than a uniform tariff at the same average level. The cost of dispersion is even larger when there is a greater degree of substitution in production (Lloyd 1974). Land and labor is often specific to agriculture but highly transferable among farm activities, so we expect variation of NRAs across farm products to be quite costly. A simple indicator of this kind of dispersion is the standard deviation of the NRA among covered products.

Each industry is classified as being import-competing, as producing exportables, or as producing a nontradable (with its status sometimes changing over the years); this classification makes it possible to generate for each year the weighted average NRAs for the two different groups of tradables. Those NRAs are used to generate a trade bias index, TBI, defined as:

$$TBI = (1 + NRAag_x/100)/(1 + NRAag_m/100) - 1 \quad (1.1)$$

where $NRAag_m$ and $NRAag_x$ are the average percentage NRAs for the import-competing and exportables parts of the agricultural sector. The TBI indicates in a single number the extent to which the typically antitrade bias (negative TBI) in agricultural policies changes over time.

Farmers are affected not just by prices of their own outputs but also, albeit indirectly through changes to factor market prices and the exchange rate, by the incentives nonagricultural producers face. That is, it is *relative* prices and hence *relative* rates of government assistance that affect producer incentives. More than 70 years ago, Lerner (1936) proved his symmetry theorem, which holds that in a two-sector economy, an import tax has the same effect as an export tax. This result carries over to a model that also includes a third sector producing nontradables, to a model with imperfect competition, regardless of the economy's size (Vousden 1990, pp. 46–7). If one assumes that there are no distortions in the markets for nontradables and that the value shares of agricultural and nonagricultural nontradable products remain constant, then the economy-wide effect of distortions to agricultural incentives can be captured by the extent to which the tradable parts of agricultural production are assisted or taxed relative to producers of other tradables. By generating estimates of the average NRA for nonagricultural tradables, it

is then possible to calculate a relative rate of assistance, defined in percentage terms as:

$$RRA = 100[(1 + NRA_{ag}^t/100)/(1 + NRA_{nonag}^t/100) - 1] \quad (1.2)$$

where NRA_{ag}^t and NRA_{nonag}^t are the weighted average percentage NRAs for the tradable parts of the agricultural and nonagricultural sectors, respectively. Since the NRA cannot be less than -100 percent if producers are to earn anything, neither can the RRA (assuming NRA_{nonag}^t is positive). And if both of those sectors are equally assisted, the RRA is zero. This measure is useful in that if it is below (above) zero, it provides an internationally comparable indication of the extent to which a country's policy regime has an anti- (pro-) agricultural bias.

Exchange rate distortions generated by dual or multiple exchange rate regimes are considered when calculating the NRAs and CTEs, following the methodology outlined in appendix A. These types of distortions have been important in many African countries, particularly during the 1970s and 1980s, making their estimated, (typically) positive NRAs for importables and (typically) negative NRAs for exportables larger than they otherwise would have been.

Dollar values of farmer assistance and consumer taxation are determined by multiplying the NRA estimates by the gross value of production at undistorted prices to obtain an estimate in current U.S. dollars of the direct gross subsidy equivalent of assistance to farmers. This estimate is then added up across products for a country and across countries for any or all products to get regional aggregate transfer estimates for the studied economies. These gross subsidy equivalent values are calculated in constant dollars and are also expressed on a per-farm-worker basis.

To obtain comparable dollar value estimates of the consumer transfer, the CTE estimate at the point at which a product is first traded is multiplied by consumption (obtained from the Food and Agriculture Organization's supply and utilization database) valued at undistorted prices to obtain an estimate in constant U.S. dollars of the tax equivalent to consumers of primary farm products. This too is added up across products for a country, and across countries for any or all products, to get regional aggregate transfer estimates for the covered farm products of the focus countries.

Estimates of Policy-Induced Distortions in Africa

We begin with the nominal rates of assistance to agriculture, then compare them with the nominal rates for nonagricultural tradables by calculating the relative rates of assistance. Dollar equivalents of assistance or taxation to farmers are also

presented, as are the consumer tax equivalents of policies that affect buyers of farm products in each country (which includes domestic processors).

Nominal rates of assistance to agriculture

Agricultural price, trade, and exchange rate policies have reduced the earnings of African farmers quite substantially.⁵ The average rate of taxation as measured by our weighted average NRA was less than 10 percent at the time many Africa countries achieved independence in the early 1960s, but it then rose sharply during the 1960s and 1970s as interventions became more severe. Reforms have since reduced the average extent of taxation to below its level of the early 1960s; there was even a brief period in the late 1980s when a combination of policy reforms and low international commodity prices brought the weighted average NRA to near zero (table 1.10). Such averages hide considerable diversity within the region, however. A visual impression of the variation across countries and the extent of reforms between 1975–79 and 2000–04 is provided in figure 1.1, showing clearly the major reduction in taxing of farmers in such countries as Ghana, Uganda, Tanzania, Cameroon, Senegal, and Madagascar. That figure also shows the transition from taxation to support of farmers in Mozambique and Kenya, as well as the transition from slight support to slight taxation in Nigeria, and the continuing heavy degree of taxation still in Côte d'Ivoire, Zambia, and Zimbabwe.

One important type of variation in distortions is the within-country dispersion of product NRAs, as measured in table 1.11 by their standard deviation around the weighted mean NRA for covered agricultural products in each period. This dispersion was highest in the middle of our 50-year period, when the NRAs were most distorting, but even after the recent reforms, dispersion is no lower than it was at the beginning of the period. The dispersion of NRAs within African countries is an important target for reform, whatever the level of average NRA.

Variation among products has a somewhat similar pattern across countries. Figure 1.2 shows the pattern of dispersion in the regionwide average NRA among the key farm commodities in the late 1970s and a quarter century later, both unweighted and weighted by value of production. As in other regions of the world, the rice pudding ingredients of sugar, rice, and milk are among the products receiving the highest assistance, while assistance is most negative for tropical cash crops such as coffee, cotton, cocoa, and tobacco. The dispersion over a wider range of products and for the full time period is summarized in table 1.12.

A third type of variation is cross-country diversity of national average NRAs. This diversity is evident from the bottom of table 1.10: NRA averages for the agricultural sector became more similar between the latter 1950s and the early 1970s,

Table 1.10. NRAs in Agriculture, 16 African Focus Countries, 1955–2004
(percent)

Country	Region	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Cameroon ^a	W	—	-2.9	-6.0	-7.4	-14.4	-11.2	-2.4	-1.1	-1.3	-0.1
Côte d'Ivoire ^a	W	—	-23.5	-29.3	-28.1	-30.8	-32.2	-24.3	-19.5	-20.0	-24.5
Egypt, Arab Rep. of	N	-23.2	-33.9	-37.7	-37.5	-15.9	-9.2	56.6	-6.1	4.0	-6.1
Ethiopia ^a	E	—	—	—	—	—	-17.5	-22.3	-24.4	-17.8	-11.2
Ghana	W	-4.4	-9.0	-19.8	-14.9	-25.6	-21.2	-6.3	-1.7	-3.0	-1.4
Kenya	E	26.6	23.0	9.7	-11.8	-1.7	-18.6	10.5	-5.8	2.4	9.3
Madagascar	S	0.2	-5.9	-11.1	-13.5	-27.1	-38.8	-18.2	-5.4	-2.9	1.0
Mozambique	S	—	—	—	—	-34.5	-25.2	-32.0	-2.7	3.9	12.4
Nigeria ^a	W	—	20.7	11.9	6.7	6.3	9.4	8.2	3.9	0.4	-5.4
Senegal ^a	W	—	-9.3	-7.2	-22.4	-22.7	-20.5	4.7	5.6	-6.1	-7.5
South Africa	S	—	4.1	9.4	-0.7	3.8	22.9	11.7	10.8	5.7	-0.1
Sudan	E	-11.7	-20.4	-31.8	-43.4	-24.3	-29.3	-35.4	-47.8	-24.5	-11.9
Tanzania ^a	E	—	—	—	—	-41.8	-56.3	-45.3	-25.2	-23.2	-12.4
Uganda ^a	E	—	-1.8	-3.1	-7.8	-17.6	-6.2	-6.8	-0.6	0.5	0.4
Zambia ^a	S	—	—	-22.4	-15.8	-37.3	-2.7	-58.9	-30.8	-28.6	-28.5
Zimbabwe	S	16.9	-27.2	-25.5	-26.0	-28.6	-24.0	-24.1	-24.9	-20.8	-38.7
Unweighted average ^b		-0.3	-7.8	-12.5	-12.9	-15.5	-13.7	-8.9	-8.7	-6.6	-6.0
Weighted average		-13.6	-7.7	-11.3	-14.7	-12.7	-7.9	-1.0	-8.9	-5.7	-7.3
Dispersion of country NRAs ^c		20.8	13.4	15.1	14.3	17.1	21.2	29.5	16.1	12.3	13.5

Sources: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–17 of this book.

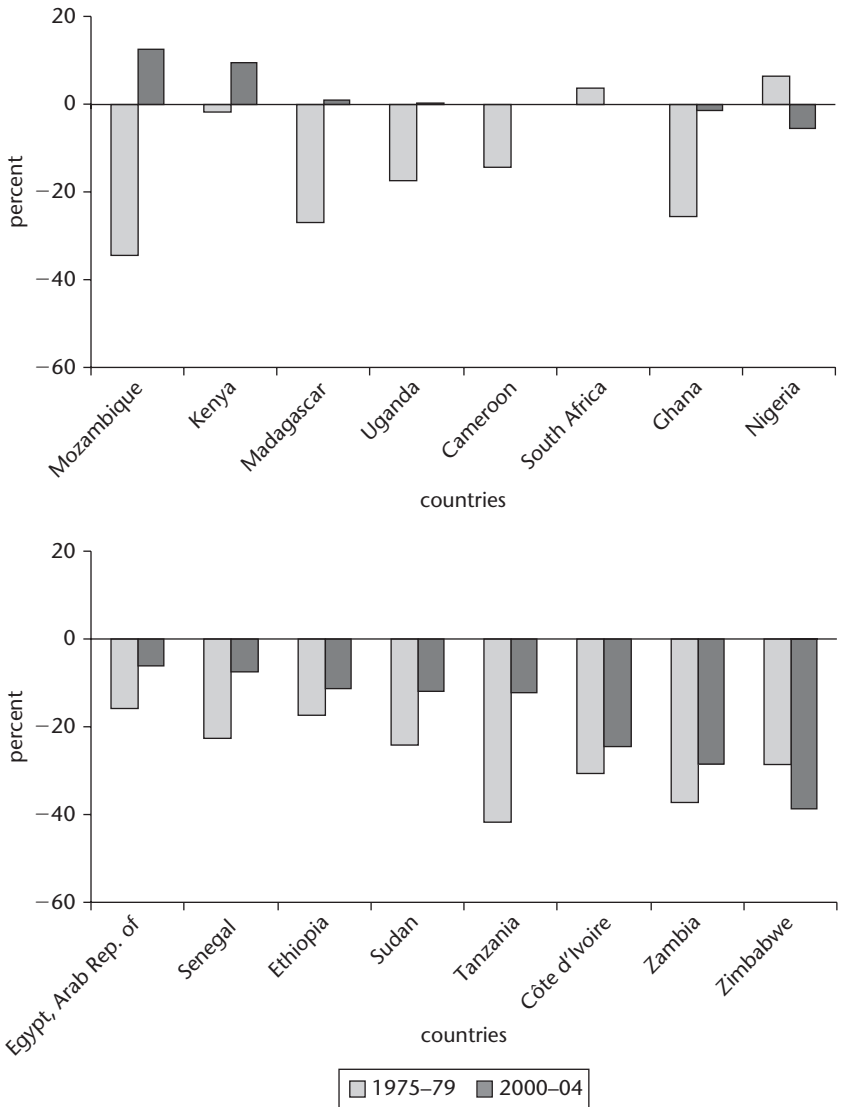
Note: The table shows the weighted average for each country, including product-specific output and input distortions and non-product-specific assistance as well as authors' guesstimates for noncovered farm products, with weights based on gross value of agricultural production at undistorted prices. — = no data are available.

a. For Cameroon, Côte D'Ivoire, Nigeria, Senegal, Uganda, and Zambia: 1960–64 = 1961–64. For Tanzania: 1975–79 = 1976–79. For Ethiopia: 1980–84 = 1981–84.

b. The unweighted average is the simple average of the national NRA (weighted) across the 16 countries.

c. Dispersion is a simple five-year average of the annual standard deviation around a weighted mean of the national agricultural sector NRAs each year.

Figure 1.1. NRAs in Agriculture, 16 African Countries, 1975–79 and 2000–04



Sources: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–17.

Note: Data for Ethiopia for the first period refer to 1981–84 because data for 1975–79 are unavailable.

Table 1.11. Dispersion of NRAs across Covered Agricultural Products, 16 African Focus Countries, 1955–2004
(percent)

Country	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Cameroon ^a	—	13.5	18.0	21.8	29.0	20.6	17.2	16.1	13.0	7.5
Côte d'Ivoire ^a	—	25.1	28.0	33.1	46.2	33.3	33.1	26.2	23.4	33.1
Egypt, Arab Rep. of	21.9	14.7	17.1	21.3	32.2	31.9	89.6	33.0	28.7	22.1
Ethiopia ^a	—	—	—	—	—	26.4	28.2	28.0	29.1	23.6
Ghana	9.8	17.2	29.9	29.0	47.9	69.6	56.3	26.2	17.2	25.5
Kenya	33.2	26.0	30.7	20.5	26.5	22.3	23.6	23.4	24.7	25.6
Madagascar	—	31.3	24.7	24.6	37.5	39.2	42.0	39.1	30.3	22.5
Mozambique	—	—	—	—	34.8	36.0	40.3	28.6	33.4	37.9
Nigeria ^a	—	112.9	95.4	94.2	89.9	92.0	94.4	83.2	72.7	53.2
Senegal ^a	—	20.3	16.1	33.5	44.5	38.2	58.8	67.1	14.3	18.6
South Africa	25.7	17.9	19.1	25.3	31.6	42.7	35.0	31.8	20.3	20.3
Sudan	34.2	34.9	34.1	36.2	40.0	31.7	54.4	75.3	41.2	63.2
Tanzania ^a	—	—	—	—	38.6	39.1	41.3	46.5	47.3	51.9
Uganda ^a	—	7.8	11.6	28.5	47.0	39.3	40.5	7.8	6.6	6.9
Zambia ^a	—	14.5	29.6	26.6	36.1	34.8	35.4	39.2	36.1	38.1
Zimbabwe	74.6	71.0	47.3	36.9	27.7	28.1	24.4	25.2	25.3	33.9
<i>African focus countries:</i>										
Unweighted average ^b	33.2	31.3	30.9	33.2	40.6	39.1	44.7	37.3	29.0	30.2
Product coverage ^c	68	73	72	72	70	67	66	66	66	68

Sources: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–17 of this book.

Note: The dispersion for each country is a simple five-year average of the annual standard deviation around a weighted mean of NRAs across covered products each year. — = no data are available.

a. For Cameroon, Côte D'Ivoire, Nigeria, Senegal, Uganda, and Zambia: 1960–64 = 1961–64. For Tanzania: 1975–79 = 1976–79. For Ethiopia: 1980–84 = 1981–84.

b. The unweighted average is the simple average across the 16 countries of their five-year simple average dispersion measures.

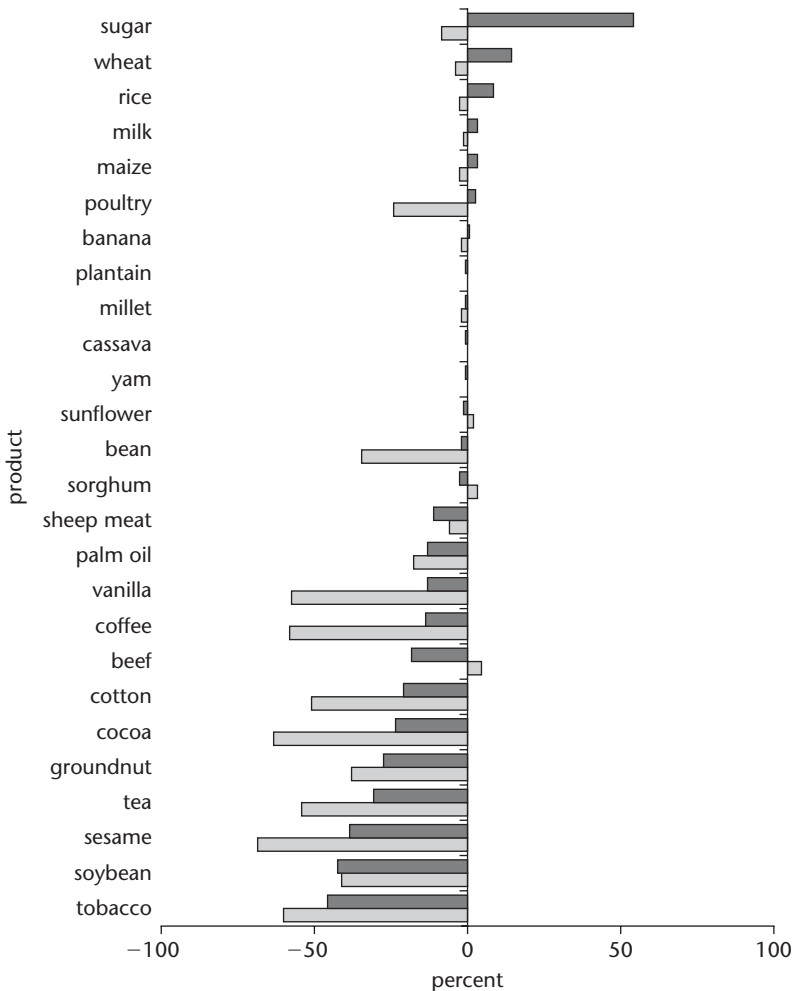
c. Share of gross value of total agricultural production, valued at undistorted prices, accounted for by covered products.

then less similar through the later 1980s, and then more similar again, so that by 2000–04, this type of dispersion was back to what it had been in the early 1960s.

The fourth important type of variation is differential treatment of import-competing and exportable products in a way that often favors self-sufficiency. The extent of antitrade bias is shown in figure 1.3 as the gap between the average NRAs

Figure 1.2. NRAs, by Key Covered Product, 21 African Focus Countries, 1975–79 and 2000–04

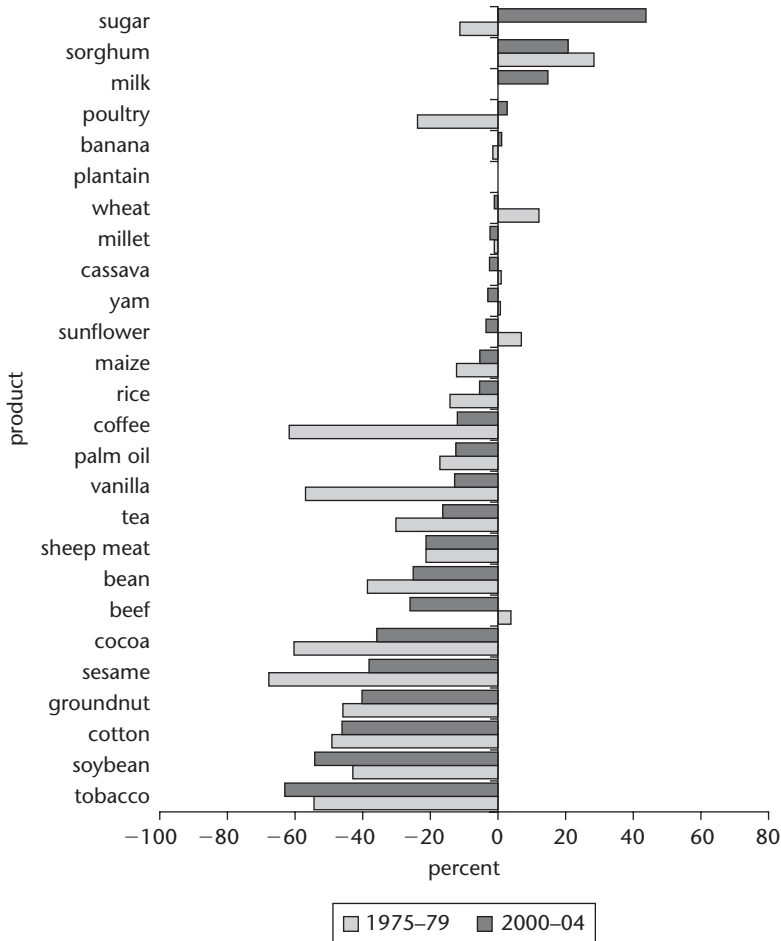
a. Unweighted average across 21 countries



(Figure continues on the following page.)

Figure 1.2. (continued)

b. Weighted average across 21 countries



Sources: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–18 of this book.

Note: The weights in figure b are based on the gross value of agricultural production at undistorted prices. Thus, each NRA (by country, by product) is weighted by the value of production of that commodity in each country in a given year.

for import-competing and exportable products. This gap grew from the 1950s to the 1980s. It has since narrowed, mainly because of changes in taxation of exportables, but the gap is still sizable. This variation is summarized in the trade bias index reported for Africa as a whole in the middle row of table 1.13, and for individual countries in table 1.14.

Table 1.12. NRAs for Key Covered Farm Products, 21 African Focus Countries, 1955–2004*(percent)*

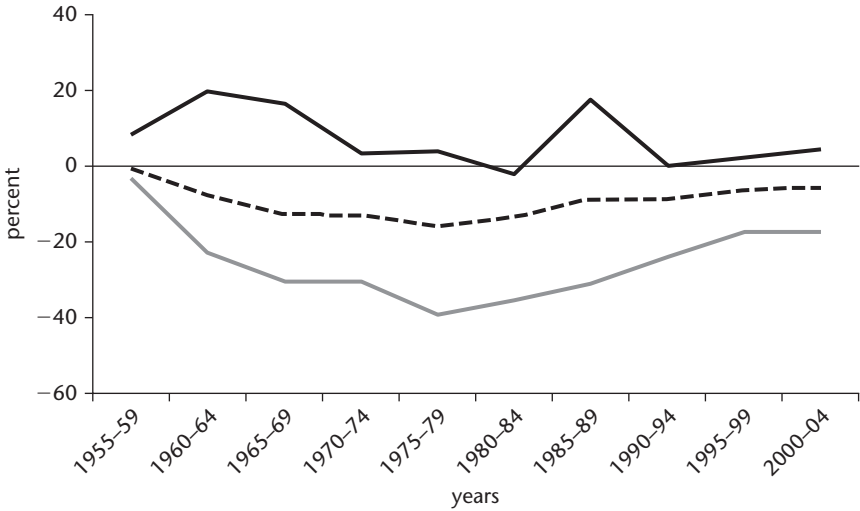
Product	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Banana	—	–2	–4	0	–2	–1	–1	3	5	1
Bean	—	6	2	–3	–39	–53	–66	–25	–24	–25
Beef	–13	–21	–29	–37	4	11	23	–38	–1	–26
Cassava	0	0	0	0	1	2	1	–1	–3	–3
Cocoa	–14	–27	–54	–48	–60	–52	–36	–35	–32	–36
Coffee	–11	–27	–36	–44	–62	–53	–42	–37	–21	–12
Cotton	–16	–41	–53	–54	–49	–43	–31	–54	–38	–46
Groundnut	–29	–27	–38	–51	–46	–44	–17	–30	–36	–40
Maize	–4	12	3	–7	–12	1	38	8	2	–5
Milk	–35	–22	–32	–42	–1	–22	67	–27	–8	15
Millet	–77	–19	–6	–4	–1	1	0	1	–3	–2
Palm oil	—	–25	–31	–44	–17	–25	–12	108	41	–13
Plantain	0	0	0	0	0	0	0	0	0	0
Poultry	—	–13	–13	–16	–24	18	–3	6	13	3
Rice	–62	–38	–39	–22	–14	–14	29	0	–8	–5
Sesame	–40	–53	–64	–65	–68	–60	–48	–48	–50	–38
Sheep meat	–12	–14	–18	–22	–21	–20	–37	–49	–45	–21
Sorghum	–35	62	87	49	28	17	41	37	23	21
Soybean	—	—	–14	–30	–43	–43	–40	–53	–50	–54
Sugar	–22	–6	11	–24	–11	–1	42	2	7	44
Sunflower	—	15	17	6	7	16	7	6	–6	–4
Tea	3	9	–7	–20	–30	–34	–29	–40	–28	–16
Tobacco	—	–42	–38	–45	–54	–47	–48	–38	–34	–63
Vanilla	—	–62	–53	–39	–57	–76	–85	–78	–28	–13
Wheat	–13	–27	–13	–6	12	–5	19	4	1	–1
Yam	0	0	0	0	1	1	0	–1	–4	–3
All covered products	–19.9	–13	–17.8	–22.1	–20.3	–12.1	0.9	–12.4	–6.6	–8.9

Sources: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–18 of this book.

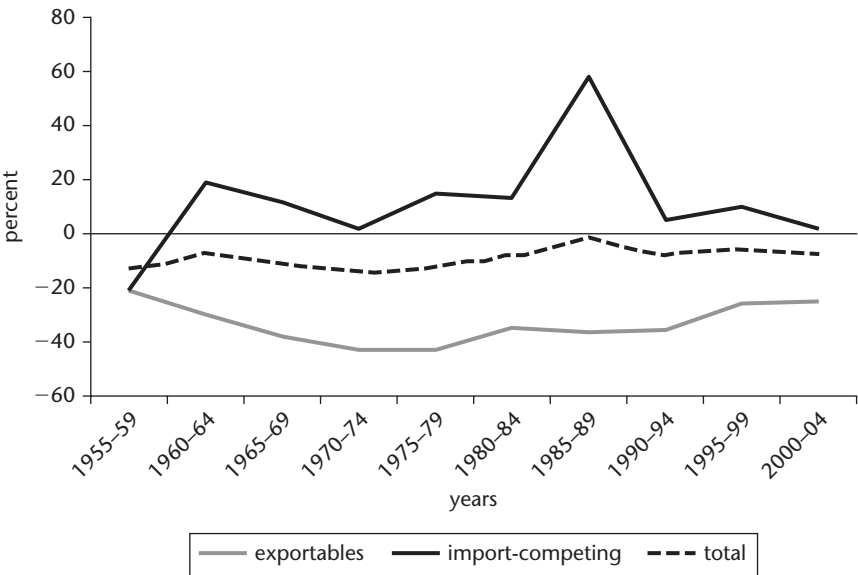
Note: — = no data are available.

Figure 1.3. NRAs for Exportable, Import-Competing, and All Farm Products, 16 African Countries, 1955–2004

a. Unweighted averages across 16 countries



b. Weighted averages across 16 countries



Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–17 of this book.

Note: The total NRA can be above or below the exportable and importable averages because assistance to nontradables and non-product-specific assistance are also included.

Table 1.13. NRAs in Agriculture Relative to Nonagricultural Industries, 16 African Focus Countries, 1955–2004
(percent)

a. Unweighted averages across 16 countries

Indicator	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRA, covered products	0.0	-14.5	-19.3	-20.2	-24.8	-20.5	-11.6	-13.3	-9.1	-8.9
NRA, noncovered products	0.6	1.0	-0.4	-0.8	-1.3	-1.5	-3.8	-3.5	-3.0	-2.9
NRA, all agricultural products	-1.8	-10.0	-14.2	-14.7	-17.0	-15.4	-10.1	-10.7	-7.1	-6.5
Total agricultural NRA ^a	-0.3	-7.8	-12.5	-12.9	-15.5	-13.7	-8.9	-8.7	-6.6	-6.0
Trade bias index ^b	-0.11	-0.35	-0.40	-0.33	-0.41	-0.34	-0.41	-0.24	-0.19	-0.21
NRA, all agricultural tradables ^a	3.1	-10.9	-19.7	-20.6	-26.2	-21.5	-13.9	-13.9	-9.3	-9.4
NRA, all nonagricultural tradables	18.8	13.1	12.6	23.5	27.0	27.3	23.0	18.8	15.2	14.5
RRA ^c	-13.2	-21.2	-28.7	-35.5	-41.8	-38.2	-29.7	-27.5	-21.2	-20.9
Memo item, ignoring exchange rate distortions										
Total agricultural NRA	7.0	-6.1	-8.4	-13.0	-13.6	-13.1	-7.6	-9.8	-8.5	-8.6
Trade bias index	0.00	-0.16	-0.13	-0.03	0.11	0.29	0.45	-0.03	-0.03	1.31
RRA ^c	-8.3	-17.1	-21.5	-27.8	-31.3	-28.7	-18.8	-23.8	-20.7	-19.6

(Table continues on the following page.)

Table 1.13. NRAs in Agriculture Relative to Nonagricultural Industries, 16 African Focus Countries, 1955–2004
(continued)

b. Weighted averages across 16 countries

Indicator	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRA, covered products	-19.9	-13.0	-17.8	-22.1	-20.3	-12.1	0.9	-12.4	-6.6	-8.9
NRA, noncovered products	0.5	3.6	1.8	-0.2	-0.3	-3.3	-7.6	-4.8	-5.1	-5.2
NRA, all agricultural products	-14.0	-8.4	-12.2	-15.6	-13.8	-9.5	-2.0	-10.0	-6.1	-7.7
Total agricultural NRA ^a	-13.6	-7.7	-11.3	-14.7	-12.7	-7.9	-1.0	-8.9	-5.7	-7.3
Trade bias index ^b	0.00	-0.41	-0.45	-0.44	-0.50	-0.43	-0.60	-0.39	-0.33	-0.26
NRA, all agricultural tradables ^a	-24.1	-13.3	-19.6	-25.0	-22.1	-13.5	-0.3	-15.4	-8.7	-12.0
NRA, all nonagricultural tradables	19.5	3.7	2.7	1.5	5.7	1.6	9.2	2.7	2.0	7.3
RRA ^c	-36.5	-15.2	-21.4	-26.0	-25.9	-13.1	-8.3	-17.1	-10.4	-18.0
Memo item, ignoring exchange rate distortions										
Total agricultural NRA	-10.3	-5.2	-7.3	-11.6	-8.9	-3.7	5.6	-6.7	-5.6	-6.2
Trade bias index	0.03	-0.14	-0.17	-0.16	-0.29	-0.05	-0.26	-0.01	0.30	0.20
RRA ^a	-26.7	-9.7	-13.4	-17.7	-17.0	-2.7	5.9	-12.7	-11.8	-16.1

Source: Anderson and Valenzuela (2008, based on estimates reported in chapters 2–17 of this book.

- NRAs including non-product-specific assistance, that is, the assistance to all primary factors and intermediate inputs as a percentage of the total primary agricultural production valued at undistorted prices.
- The trade bias index is $TBI = (1 + NRA_{ag,x}/100)/(1 + NRA_{ag,m}/100) - 1$, where $NRA_{ag,m}$ and $NRA_{ag,x}$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector. The regional average TBI is calculated from the regional averages of the NRAs for exportable and import-competing parts of the agricultural sector.
- The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Table 1.14. NRAs for Exportable and Import-Competing Farm Products, and the Trade Bias Index, 16 African Focus Countries, 1955–2004

(percent)

Country, agricultural sector	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
<i>Cameroon^a</i>										
NRA, exportables	—	-16.4	-26.0	-28.9	-38.5	-28.5	-7.4	-4.7	-4.7	-1.1
NRA, import competitors	—	—	—	—	—	—	—	—	—	—
Trade bias index	—	—	—	—	—	—	—	—	—	—
Exportables share	—	100	100	100	100	100	100	100	100	100
<i>Côte d'Ivoire^a</i>										
NRA, exportables	—	-47.2	-50.3	-48.7	-57.3	-57.9	-44.2	-47.9	-41.8	-46.3
NRA, import competitors	—	13.7	-0.1	15.7	42.6	18.9	22.6	15.2	14.8	16.6
Trade bias index	—	-0.5	-0.50	-0.55	-0.70	-0.64	-0.54	-0.55	-0.49	-0.54
Exportables share	—	77	76	78	82	81	84	76	75	78
<i>Egypt, Arab Rep. of</i>										
NRA, exportables	-31.5	-52.4	-62.4	-62.2	-43.4	-34.0	5.0	-30.9	-17.8	-29.7
NRA, import competitors	-34.3	-44.0	-44.6	-44.4	-5.5	-2.5	138.2	2.4	16.9	-0.8
Trade bias index	0.05	-0.15	-0.32	-0.31	-0.39	-0.28	-0.55	-0.31	-0.29	-0.28
Exportables share	48	49	51	47	46	35	38	34	32	28
<i>Ethiopia^a</i>										
NRA, exportables	—	—	—	—	—	-33.8	-44.9	-48.0	-40.0	-20.4
NRA, import competitors	—	—	—	—	—	—	—	—	—	—
Trade bias index	—	—	—	—	—	—	—	—	—	—
Exportables share	—	—	—	—	—	100	100	100	100	100

(Table continues on the following page.)

Table 1.14. NRAs for Exportable and Import-Competing Farm Products, and the Trade Bias Index, 16 African Focus Countries, 1955–2004 (continued)

Country, agricultural sector	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
<i>Ghana</i>										
NRA, exportables	-14.9	-23.9	-54.5	-46.6	-74.4	-76.3	-53.3	-33.1	-19.4	-19.6
NRA, import competitors	9.8	15.4	10.8	11.7	27.2	44.6	53.4	26.7	17.5	28.3
Trade bias index	-0.22	-0.34	-0.59	-0.53	-0.79	-0.84	-0.69	-0.47	-0.31	-0.37
Exportables share	77	81	76	69	76	72	66	53	73	68
<i>Kenya</i>										
NRA, exportables	25.5	16.8	3.3	-16.3	-2.3	-13.0	-14.0	-26.1	-10.1	-0.5
NRA, import competitors	12.3	2.4	4.2	-46.0	-25.3	-40.5	16.1	-35.4	2.9	9.3
Trade bias index	0.1	0.2	0.09	0.64	0.48	0.57	-0.24	0.31	-0.12	-0.09
Exportables share	88	75	72	77	88	76	87	54	57	55
<i>Madagascar</i>										
NRA, exportables	0.0	-16.7	-22.5	-16.9	-60.1	-73.0	-62.2	-32.5	-18.0	-20.7
NRA, import competitors	17.7	20.4	13.0	-18.3	-19.6	-41.2	3.1	3.6	4.5	8.3
Trade bias index	-0.15	-0.31	-0.27	0.14	-0.47	-0.53	-0.62	-0.34	-0.21	-0.27
Exportables share	92	98	63	34	49	48	48	36	28	26
<i>Mozambique</i>										
NRA, exportables	—	—	—	—	-73.3	-68.6	-76.4	-25.5	-3.1	-3.9
NRA, import competitors	—	—	—	—	-67.7	-63.6	-72.2	-5.2	29.5	57.7
Trade bias index	—	—	—	—	-0.05	0.08	0.38	-0.20	-0.25	-0.39
Exportables share	—	—	—	—	69	60	47	50	40	49
<i>Nigeria^a</i>										
NRA, exportables	—	-34.3	-49.3	-57.2	-51.5	-43.0	-53.4	-24.3	-19.5	-18.5
NRA, import competitors	—	216.4	176.8	152.4	87.8	67.2	92.8	39.7	28.9	-9.1
Trade bias index	—	-0.8	-0.82	-0.81	-0.74	-0.66	-0.70	-0.45	-0.36	-0.04
Exportables share	—	65	65	58	54	41	42	28	31	24

<i>Senegal^a</i>										
NRA, exportables	—	-18.7	-16.6	-39.5	-42.5	-39.7	-9.1	-6.7	-13.5	-19.5
NRA, import competitors	—	19.9	15.0	14.1	24.4	14.1	56.3	61.1	8.5	15.3
Trade bias index	—	-0.3	-0.27	-0.47	-0.54	-0.47	-0.42	-0.42	-0.20	-0.30
Exportables share	—	84	80	84	84	79	73	76	75	76
<i>South Africa</i>										
NRA, exportables	39.9	2.7	8.2	-10.0	2.5	34.6	40.5	32.9	16.0	5.3
NRA, import competitors	10.1	2.7	8.6	5.1	7.7	26.3	1.1	0.1	2.8	-2.8
Trade bias index	0.6	0.01	0.00	-0.14	-0.03	0.07	0.40	0.33	0.13	0.10
Exportables share	34	51	42	56	55	42	35	30	31	35
<i>Sudan</i>										
NRA, exportables	-21.9	-35.0	-43.1	-50.9	-37.5	-38.3	-57.8	-64.7	-41.4	-33.8
NRA, import competitors	19.6	19.6	-10.5	-34.6	23.8	-8.6	65.0	-20.4	-6.5	35.5
Trade bias index	-0.3	-0.45	-0.36	-0.24	-0.46	-0.26	-0.74	-0.48	-0.35	-0.50
Exportables share	83	81	79	81	84	81	85	75	63	71
<i>Tanzania^a</i>										
NRA, exportables	—	—	—	—	-68.8	-77.4	-75.4	-57.0	-43.8	-36.4
NRA, import competitors	—	—	—	—	-40.2	-50.4	-12.0	5.7	-12.2	2.4
Trade bias index	—	—	—	—	-0.43	-0.55	-0.71	-0.58	-0.29	-0.35
Exportables share	—	—	—	—	64	66	68	61	58	56
<i>Uganda^a</i>										
NRA, exportables	—	-8.4	-15.1	-43.4	-89.7	-66.2	-64.8	-9.4	-1.2	-0.2
NRA, import competitors	—	15.2	20.6	42.2	79.9	54.8	58.2	15.1	13.9	14.8
Trade bias index	—	-0.20	-0.30	-0.58	-0.94	-0.77	-0.77	-0.21	-0.13	-0.13
Exportables share	—	84	82	78	90	69	67	78	66	76

(Table continues on the following page.)

Table 1.14. NRAs for Exportable and Import-Competing Farm Products, and the Trade Bias Index, 16 African Focus Countries, 1955–2004 (continued)

Country, agricultural sector	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
<i>Zambia^a</i>										
NRA, exportables	—	-23.4	-29.8	-46.4	-58.2	-47.7	-77.0	-57.7	-45.9	-51.4
NRA, import competitors	—	-2.3	-21.6	-41.8	-55.0	-23.0	-67.8	-53.7	-27.0	-10.1
Trade bias index	—	-0.21	0.08	-0.06	-0.08	-0.30	-0.28	-0.08	-0.22	-0.46
Exportables share	—	49	55	54	71	18	22	26	37	68
<i>Zimbabwe</i>										
NRA, exportables	23.9	-39.4	-36.8	-45.4	-55.8	-50.0	-44.2	-44.3	-34.8	-66.7
NRA, import competitors	26.8	-1.6	26.2	1.9	-24.6	-25.2	-17.0	-48.5	-52.5	-78.2
Trade bias index	-0.01	-0.37	-0.50	-0.44	-0.40	-0.33	-0.31	0.13	0.45	0.83
Exportables share	100	98	99	97	95	85	95	83	82	69
All studied Africa, unweighted averages ^b										
NRA, exportables	-3.1	-22.7	-30.4	-30.5	-39.0	-35.2	-31.0	-24.1	-17.5	-17.6
NRA, import competitors	8.5	19.7	16.5	3.4	4.1	-2.1	17.8	0.3	2.2	4.6
Trade bias index	-0.11	-0.35	-0.40	-0.33	-0.41	-0.34	-0.41	-0.24	-0.19	-0.21
All studied Africa, weighted averages ^b										
NRA, exportables	-20.6	-30.1	-38.4	-42.6	-42.6	-35.0	-36.7	-35.8	-26.1	-24.6
NRA, import competitors	-20.6	18.6	11.8	1.9	14.5	13.2	58.3	5.2	9.8	1.6
Trade bias index	0.00	-0.41	-0.45	-0.44	-0.50	-0.43	-0.60	-0.39	-0.33	-0.26
Exportables share	61	66	64	63	67	61	63	54	54	54

Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–17 of this book.

Note: For a definition of the trade bias index, see table 1.13, note b. The exportables share is the share of the gross value of production of tradables at undistorted prices that is attributable to the exportable subsector of agriculture. — = no data are available.

a. For Cameroon, Côte D'Ivoire, Nigeria, Senegal, Uganda, and Zambia: 1960–64 = 1961–64. For Tanzania: 1975–79 = 1976–79. For Ethiopia: 1980–84 = 1981–84.

b. The regional averages of the trade bias index are calculated from the regional averages of the NRAs for exportable and import-competing parts of the agricultural sector.

Decomposing the NRA into components reveals a subtle but important influence on the aggregate average. The final “exportables share” row of table 1.14 shows that since the late 1970s, the share of tradable farm products that are exportable has fallen from two-thirds to just over one-half (from 67 percent to 54 percent). Many governments tax trade in both directions, with negative NRAs for exportables and positive NRAs for importables, so the changing composition of African agriculture from exportable to importable helps drive the aggregate NRA toward zero. This compositional effect adds to the changes within the exportable and import-competing subsectors illustrated in figure 1.3.

Another important decomposition of the average NRA is provided in table 1.15, showing the contribution of domestic input subsidies, output taxes or subsidies, and border measures. In the African context, price distortions for product-specific inputs contributed so little to the sectoral NRA estimates that in many cases the case-study authors reported no values at all. Interventions in domestic markets also contributed relatively little. Most of the region’s measured NRA is attributable to border measures—largely trade taxes, quantitative trade restrictions, and the operations of parastatal trading companies.

In aggregate, the total value of taxes on farming has been substantial. Africa’s antiagricultural bias in NRA terms peaked in the late 1970s, but the sector has grown, and so the total value of annual transfers from farmers has risen from around \$2 billion in constant 2000 U.S. dollars in the early 1960s (note that NRAs were available for only four-fifths as much agricultural production then as after 1980) to \$10 billion in the 1970s, and back to around \$6 billion in the 1980s (ignoring the mid-1980s period when international prices were at record lows), 1990s, and 2000–04 (see bottom row of table 1.16a). The distribution across countries is shown in figure 1.4, where it is clear that the major transfers in recent years have been from farmers in Ethiopia and Sudan in the east, Zimbabwe in the south, and Côte d’Ivoire and Nigeria in the west. What is also clear from that figure is how much decline there has been in such transfers since the late 1970s, particularly in Egypt and Tanzania but also in many smaller African economies. For Africa as a whole, the latest estimate is equivalent to a gross annual tax of \$40 for each person engaged in agriculture, down from more than three times that amount in the 1970s (bottom row of table 1.16b), but still larger than government investment or foreign aid targeted to agriculture (Masters forthcoming, figure 9). As shown in table 1.17 and figure 1.5, the burden of taxation was imposed mainly through the three major export cash crops (cocoa, coffee, and cotton) plus groundnuts, beef, rice, and sugar in the 1970s. Three decades later those cash crops are still the main source of transfer from agriculture, whereas sugar and milk have become positively assisted.

Table 1.15. NRAs for Covered Farm Products, by Policy Instrument, 21 African Focus Countries, 1955–2004
(percent)

Policy instrument	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Unweighted averages										
NRA, inputs	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
NRA, domestic market support	-1.3	-0.6	-0.7	-0.7	-1.1	-1.4	-0.8	-1.1	-1.2	-1.2
NRA, border market support	1.3	-13.9	-18.7	-19.5	-23.8	-19.2	-10.8	-12.2	-7.9	-7.7
NRA, total	0.0	-14.5	-19.3	-20.2	-24.8	-20.5	-11.6	-13.3	-9.1	-8.9
Weighted averages ^a										
NRA, inputs	0.0	0.1	0.1	0.1	0.3	0.6	0.2	0.1	0.1	0.2
NRA, domestic market support	-2.1	-0.9	-0.7	-1.0	-1.6	-1.9	-2.1	-1.6	-2.8	-3.0
NRA, border market support	-17.8	-12.2	-17.2	-21.3	-19.0	-10.9	2.8	-10.8	-3.9	-6.0
NRA, total	-19.9	-13.0	-17.8	-22.1	-20.3	-12.1	0.9	-12.4	-6.6	-8.9

Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–18 of this book.

Note: For Cameroon, Côte D'Ivoire, Nigeria, Senegal, Uganda, and Zambia: 1960–64 = 1961–64. For Tanzania: 1975–79 = 1976–79. For Ethiopia: 1980–84 = 1981–84.

a. Weights are based on gross value of agricultural production at undistorted prices.

Table 1.16. Gross Subsidy Equivalents of Assistance to Farmers, 21 African Focus Countries, 1955–2004
(constant 2000 US\$ millions)

a. Total

Country	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Benin	—	—	—	-8	-4	-5	-3	-13	-17	-4
Burkina Faso	—	—	—	-5	-11	-12	-5	-10	-13	0
Cameroon	—	-83	-174	-263	-636	-274	-48	-33	-39	-4
Chad	—	—	—	-20	-25	-15	-2	-7	-8	-1
Côte d'Ivoire	—	-406	-603	-742	-2,223	-1,535	-1,047	-752	-878	-911
Egypt, Arab Rep. of	-1,561	-2,472	-3,348	-4,153	-2,046	-1,204	5,348	-582	354	-571
Ethiopia	—	—	—	—	—	-1,863	-2,392	-2,188	-2,096	-1,113
Ghana	-103	-188	-350	-334	-727	-404	-91	-28	-78	-34
Kenya	137	162	75	-134	-157	-408	168	-77	35	140
Madagascar	2	-84	-185	-358	-555	-579	-239	-73	-39	10
Mali	—	—	—	-12	-28	-22	-11	-18	-31	2
Mozambique	—	—	—	—	-280	-198	-120	-20	51	55
Nigeria	—	2,193	1,176	867	986	2,198	1,402	794	96	-1,034
Senegal	—	-76	-54	-234	-377	-220	45	37	-31	-42
South Africa	—	186	500	-300	330	2,067	853	841	456	14
Sudan	-344	-686	-1,200	-2,547	-1,861	-2,373	-2,984	-3,633	-1,848	-1,210
Tanzania	—	—	—	—	-1,525	-1,062	-665	-322	-576	-330
Togo	—	—	—	-1	-2	-6	-4	-7	-7	-3
Uganda	—	-36	-64	-199	-462	-144	-111	-12	18	14
Zambia	—	—	-149	-112	-388	-31	-396	-178	-197	-158
Zimbabwe	39	-347	-305	-475	-779	-602	-533	-536	-467	-851
African focus countries	-1,829	-1,838	-4,682	-9,030	-10,770	-6,691	-834	-6,817	-5,314	-6,031

(Table continues on the following page.)

Table 1.16. Gross Subsidy Equivalents of Assistance to Farmers, 21 African Focus Countries, 1955–2004 (continued)
(constant 2000 US\$)

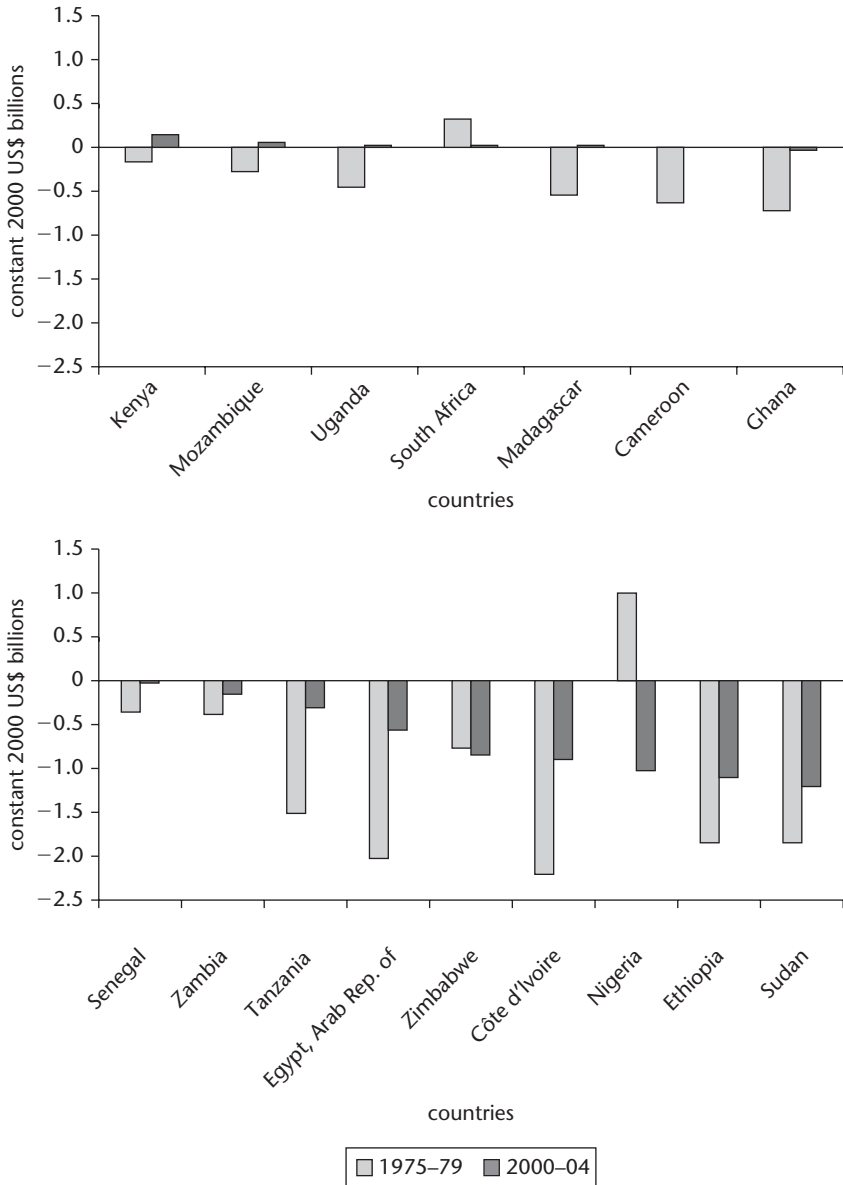
b. Per person engaged in agriculture

Country	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Benin	—	—	-8	-4	-4	-2	-9	-11	-3
Burkina Faso	—	—	-2	-3	-3	-1	-2	-3	0
Cameroon	-35	-71	-102	-241	-99	-16	-10	-11	-1
Chad	—	—	-12	-14	-7	-1	-3	-3	0
Côte d'Ivoire	-275	-368	-402	-1,072	-644	-382	-250	-280	-292
Egypt, Arab Rep. of	-363	-459	-535	-250	-144	672	-75	43	-67
Ethiopia	—	—	—	—	—	—	-107	-94	-45
Ghana	-86	-149	-130	-248	-120	-23	-6	-15	-6
Kenya	41	17	-27	-27	—	—	-8	3	11
Madagascar	-34	-67	-116	-162	-151	-56	-15	-7	2
Mali	—	—	-4	-9	-6	-3	-5	-7	0
Mozambique	—	—	—	-53	-34	-21	-3	7	7
Nigeria	174	86	60	69	153	96	54	6	-68
Senegal	-55	-35	-137	-196	-103	19	14	-11	-13
South Africa	75	197	-122	156	1,097	442	440	250	8
Sudan	-176	-292	-574	-381	-432	-482	-539	-255	-156
Tanzania	—	—	—	-196	-121	-65	-27	-43	-22
Togo	—	—	-2	-3	-7	-4	-7	-7	-2
Uganda	-10	-15	-42	-88	-24	-16	-2	2	2
Zambia	—	-106	-71	-215	-15	-164	-65	-67	-52
Zimbabwe	-225	-180	-249	-363	-244	-182	-161	-132	-237
African focus countries	-29	-68	-120	-134	-77	-9	-55	-39	-41

Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–18 of this book.

Note: For Cameroon, Côte D'Ivoire, Nigeria, Senegal, Uganda, and Zambia: 1960–64 = 1961–64. For Tanzania: 1975–79 = 1976–79. For Ethiopia: 1980–84 = 1981–84. — = no data are available.

Figure 1.4. Gross Subsidy Equivalents of Assistance to Farmers, 16 African Countries, 1975–79 and 2000–04



Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–17 of this book.

Note: Data for Tanzania for 1975–79 are for 1976–79.

Table 1.17. Gross Subsidy Equivalents of Assistance to Farmers in Africa, Key Covered Products, 1955–2004
(constant 2000 \$US millions)

a. By product

Product	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Banana	—	-1	-1	0	-1	0	-1	7	10	1
Bean	—	1	1	-3	-258	-232	-217	-58	-137	-134
Beef	-152	-422	-813	-1,512	26	425	1,236	-2,235	-43	-1,549
Cassava	—	4	5	10	49	182	43	-35	-307	-209
Cocoa	-110	-421	-882	-1,033	-2,419	-1,257	-833	-532	-731	-890
Coffee	-12	-290	-496	-837	-3,139	-1,574	-1,053	-452	-346	-82
Cotton	-364	-1,203	-1,767	-2,254	-2,362	-1,424	-947	-1,569	-850	-858
Groundnut	-27	-271	-501	-979	-1,176	-881	-204	-385	-545	-640
Maize	-28	306	65	-500	-723	49	1,913	498	171	-417
Milk	-337	-218	-350	-609	-10	-451	1,019	-522	-254	374
Millet	-106	-89	-95	-81	-25	17	-3	12	-66	-40
Palm oil	—	-117	-132	-154	-132	-96	-80	373	182	-89
Plantain	—	—	—	—	—	0	0	-2	-4	-2
Poultry	—	-21	-35	-87	-267	190	-19	77	185	52
Rice	-327	-379	-652	-884	-460	-333	549	0	-236	-133
Sesame	-63	-98	-112	-243	-298	-210	-109	-80	-145	-73
Sheep meat	-75	-94	-148	-279	-323	-338	-490	-647	-595	-319
Sorghum	-136	1,113	1,186	1,008	685	409	704	613	496	330
Soybean	—	—	-1	-2	-14	-22	-20	-20	-23	-19
Sugar	-30	-31	70	-480	-356	-254	403	6	70	429
Sunflower	—	8	6	1	11	23	6	8	-11	-5
Tea	2	8	-10	-37	-154	-160	-134	-212	-179	-92
Tobacco	—	-306	-148	-143	-271	-215	-219	-223	-211	-315
Vanilla	—	-13	-13	-12	-17	-49	-80	-43	-9	-17
Wheat	-80	-236	-91	-160	117	-132	632	166	49	-60
Yam	—	2	4	14	37	79	13	-32	-262	-182

b. By subsector

Years	GSE for covered farm products	GSE for noncovered farm products	Total GSE, all direct assistance to farmers			
			Total	Exportables	Import-competing	Non-tradables
1955–95	-1.9	0.0	-1.9	-1.1	-0.7	0.0
1960–64	-2.9	0.4	-2.2	-4.0	1.5	0.0
1965–69	-5.2	0.2	-4.7	-6.1	1.0	0.0
1970–74	-9.5	0.0	-9.0	-9.6	0.1	0.0
1975–79	-11.8	0.0	-10.5	-13.9	2.3	-0.2
1980–84	-6.9	-0.8	-6.3	-9.5	2.1	-0.3
1985–89	0.4	-1.8	-0.7	-9.5	8.6	-0.6
1990–94	-6.4	-1.2	-6.8	-7.7	0.8	-0.7
1995–99	-4.1	-1.6	-5.3	-6.3	2.0	-1.3
2000–04	-5.0	-1.4	-6.0	-5.7	0.3	-1.0

Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–18 of this book.

Note: Gross subsidy equivalents (GSEs) include assistance to nontradables and non-product-specific assistance.

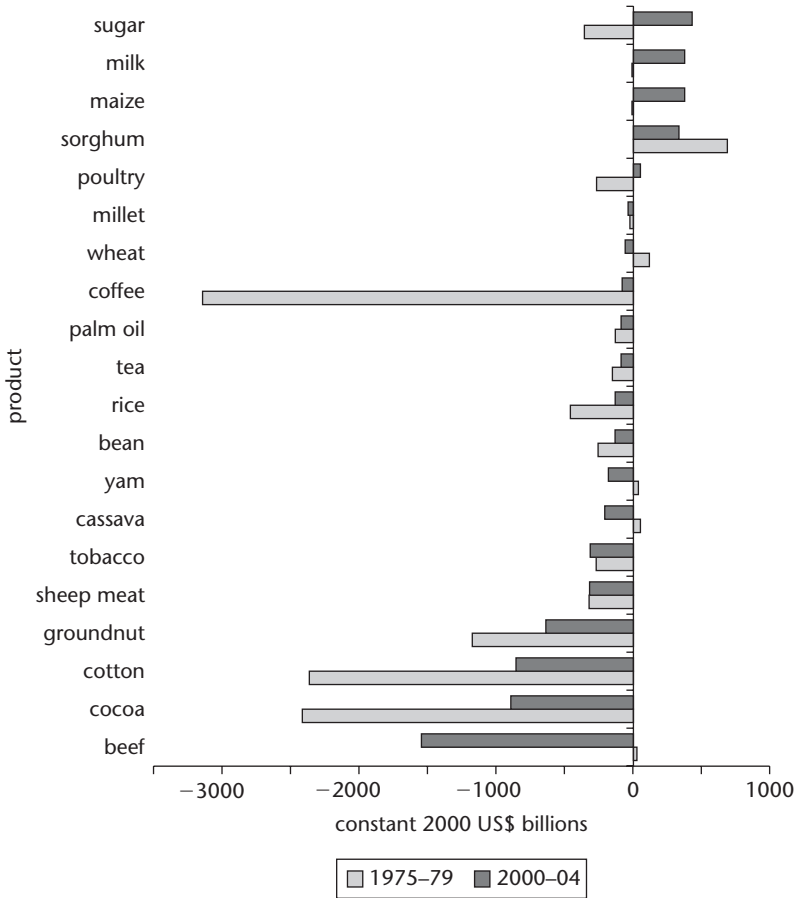
In summary, the level and dispersion of agricultural NRAs confirm that there has been substantial reform toward less distortion of incentives. However, these NRAs also suggest that there are still many opportunities for policy changes that would be both pro-poor and progrowth, raising income for low-income farmers and improving resource allocation within and between countries.

Assistance to nonfarm sectors and relative rates of assistance

The antifarm policy biases of the past stemmed not only from agricultural policies but also from policies affecting mobile resources engaged in other sectors. For example, to the extent that protection to manufacturing also has declined over time, the relative burden on agriculture has diminished even more than the agricultural NRA suggests.

The results of this study aim to capture intersectoral effects through using the NRA for nonagricultural products to generate the relative rate of assistance between farm and nonfarm activities. The case studies were far more focused on agricultural policy, and their NRAs for the nonfarm sector typically were measured using data on applied trade taxes rather than price comparisons. As a result, unlike for farm NRAs, the estimated nonfarm NRAs usually do not include the

Figure 1.5. Gross Subsidy Equivalents of Assistance to Farmers in 21 African Focus Countries, by Product, 1975–79 and 2000–04



Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–18 of this book.

effects of quantitative trade restrictions, which were important in earlier decades but have been relaxed in recent times. The nonfarm NRAs also do not capture distortions in the services sectors, some of which now produce tradables or use resources that are mobile between sectors. We can therefore be confident that the estimated NRAs for nonfarm activities are smaller and decline less rapidly than in fact was the case, and that our RRA estimates understate the past level of antifarm bias.

Even though the estimates of the NRA for nonfarm tradables should be considered lower-bound estimates, they turn out to be nonetheless quite large. Their unweighted average among the African focus countries rose from around 12 percent in the 1960s to 27 percent during 1975–84 before declining to around 15 percent during the most recent decade or so. As a result, the unweighted RRA is lower and dips even more (to –42 percent) in the middle of the studied period than does the NRA for agriculture, before returning at the end of the period to around the –20 percent it was in the early 1960s (figure 1.6a).

The 10 five-year RRAs and their two component NRAs for each country are summarized in table 1.18. A visual picture of RRA changes in the focus countries since the latter 1970s is provided by figure 1.7. Even after the reforms since the 1980s, only three of these countries had a set of incentives in 2000–04 that was neutral between agriculture and other tradable sectors, namely, Kenya, Mozambique, and South Africa. But other than Zimbabwe, none has a worse set of intersectoral distortions now than it had in the 1970s.

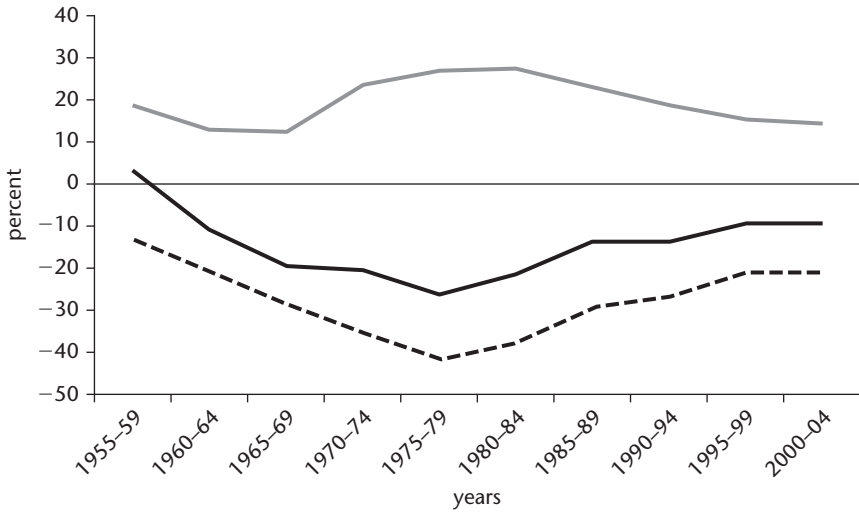
Comparisons across regions and countries

Trends in agricultural NRAs and in intersectoral RRAs for Africa, Asia, and Latin America are summarized in figure 1.8, which shows that other regions have had similar—but even steeper—trends over most of the past four decades. These similarities suggest that common political economy forces might be at work. Indeed, agricultural NRAs and RRAs tend to be positively correlated with per capita income and revealed comparative advantage in trade (see Anderson 1995), even in Africa (but less so than in Asia and Latin America; see chapter 1 of Anderson and Martin 2008 and Anderson and Valdés 2008). This tendency is confirmed statistically in the simple regressions with country-fixed effects shown in figure 1.9, and with the multiple regressions with country- and time-fixed effects shown in table 1.19.

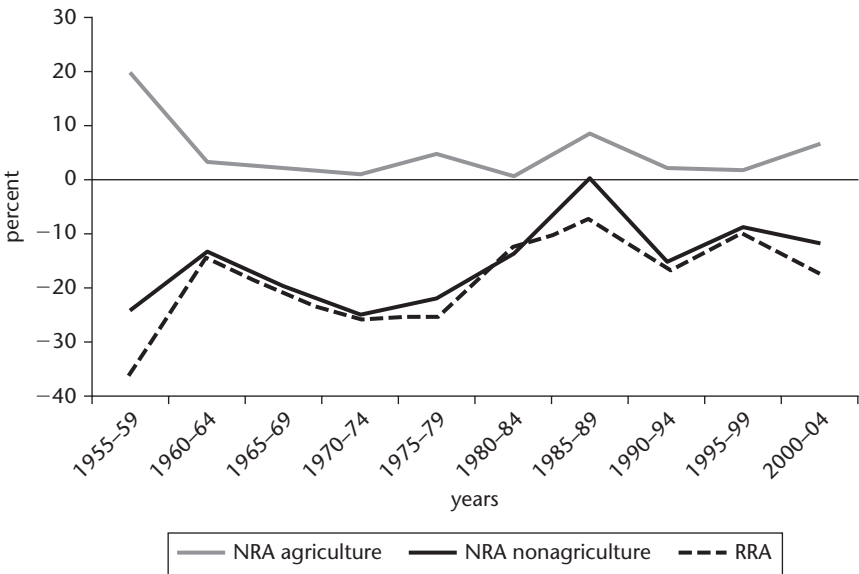
Looking across countries, one can ask whether policy changes have helped make the international location of production more or less efficient over the past five decades. To answer that question well, these NRA data should be analyzed using a global computable general equilibrium model. Until that can be done, a crude approach is to examine the standard deviation of RRAs across the economies of the region over time. That indicator suggests that distortions were more dispersed across African countries up to the 1980s but less so thereafter; that measure averaged around 30 percent during 1955–79, nearly 45 percent during the 1980s, but only 20 percent during 2000–04 (final row of table 1.18).

Figure 1.6. NRAs for Agricultural and Nonagricultural Tradables and the RRA, 16 African Countries, 1955–2004

a. Unweighted averages across 16 countries



b. Weighted averages across 16 countries



Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–17 of this book.

Note: For a definition of the RRA, see table 1.13, note c.

Table 1.18. RRAs for Agriculture, 16 African Focus Countries, 1955–2004*(percent)*

Country	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
<i>Cameroon</i>										
NRA, agricultural	—	–14.2	–24.7	–27.0	–36.9	–27.3	–5.2	–3.7	–4.2	–0.5
NRA, nonagricultural	—	18.4	22.8	25.9	29.8	29.4	24.7	19.1	18.3	14.9
RRA	—	–27.6	–38.5	–41.9	–51.0	–43.6	–23.1	–18.8	–19.0	–13.4
<i>Côte d'Ivoire</i>										
NRA, agricultural	—	–32.9	–38.1	–35.0	–38.6	–42.9	–33.3	–32.7	–27.5	–32.5
NRA, nonagricultural	—	15.9	11.7	9.6	20.2	14.7	17.2	11.2	7.5	4.4
RRA	—	–42.1	–44.6	–40.7	–48.7	–50.2	–43.1	–39.5	–32.6	–35.4
<i>Egypt, Arab Rep. of</i>										
NRA, agricultural	–33.1	–48.1	–53.6	–53.0	–23.2	–13.3	87.3	–9.1	5.9	–9.2
NRA, nonagricultural	31.2	42.3	44.2	40.3	23.5	17.4	20.9	25.5	25.2	24.5
RRA	–49.0	–63.4	–67.8	–66.5	–37.8	–26.3	55.6	–27.3	–15.5	–27.0
<i>Ethiopia</i>										
NRA, agricultural	—	—	—	—	—	–33.8	–44.9	–48.0	–40.0	–20.4
NRA, nonagricultural	—	—	—	—	—	40.2	51.3	44.5	20.8	10.5
RRA	—	—	—	—	—	–52.6	–63.4	–63.8	–49.8	–27.9
<i>Ghana</i>										
NRA, agricultural	–9.3	–16.6	–38.8	–28.9	–50.2	–39.9	–17.3	–5.7	–8.8	–3.3
NRA, nonagricultural	3.7	1.5	–0.3	2.7	–5.5	–0.1	1.0	3.8	3.4	5.2
RRA	–12.5	–18.0	–38.4	–30.8	–47.5	–39.3	–18.7	–9.2	–11.7	–8.0
<i>Kenya</i>										
NRA, agricultural	41.5	37.7	15.7	–13.3	11.8	–6.5	20.3	–4.3	3.1	12.3
NRA, nonagricultural	20.0	21.9	29.2	24.5	20.0	33.2	28.3	18.0	13.8	10.3
RRA	17.9	12.7	–10.4	–30.2	–6.9	–29.9	–6.1	–18.7	–9.3	1.9

(Table continues on the following page.)

Table 1.18. RRAs for Agriculture, 16 African Focus Countries, 1955–2004 (continued)

Country	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
<i>Madagascar</i>										
NRA, agricultural	1.4	-15.8	-24.4	-21.3	-41.6	-57.5	-38.1	-16.8	-8.3	1.5
NRA, nonagricultural	—	11.3	12.4	8.7	13.3	20.0	12.7	11.5	10.2	14.4
RRA	—	-26.0	-32.8	-27.6	-48.2	-64.2	-44.8	-25.4	-16.7	-11.3
<i>Mozambique</i>										
NRA, agricultural	—	—	—	—	-70.1	-67.3	-75.1	-15.4	16.3	26.0
NRA, nonagricultural	—	—	—	—	28.0	28.0	28.0	28.0	28.2	23.1
RRA	—	—	—	—	-76.7	-74.4	-80.6	-33.9	-9.4	2.4
<i>Nigeria</i>										
NRA, agricultural	—	54.4	30.5	18.7	19.2	41.8	24.8	20.7	14.9	-7.5
NRA, nonagricultural	—	1.4	1.1	-1.7	-2.9	-2.9	-2.2	-6.2	-9.0	-0.5
RRA	—	52.3	29.0	20.8	22.6	45.6	27.4	28.8	26.2	-7.0
<i>Senegal</i>										
NRA, agricultural	—	-12.7	-10.5	-30.9	-31.1	-28.0	8.2	9.7	-8.1	-10.9
NRA, nonagricultural	8.4	11.1	11.6	10.3	11.1	9.1	12.4	10.9	9.8	11.4
RRA	—	-21.4	-19.8	-37.4	-37.9	-34.1	-3.6	-1.0	-16.3	-20.1
<i>South Africa</i>										
NRA, agricultural	—	5.2	11.9	-0.7	5.2	31.7	17.5	14.6	7.9	0.4
NRA, nonagricultural	—	3.6	3.2	2.5	2.6	5.8	5.5	7.0	4.0	2.6
RRA	—	1.5	8.4	-3.1	2.4	24.4	11.3	7.2	3.7	-2.2
<i>Sudan</i>										
NRA, agricultural	—	-25.8	-36.4	-48.1	-28.0	-32.6	-38.5	-53.6	-28.8	-14.2
NRA, nonagricultural	0.9	-2.4	-5.6	-4.7	-6.7	1.5	-8.5	7.1	8.8	4.2
RRA	—	-23.4	-32.7	-45.6	-22.7	-33.5	-32.9	-55.4	-34.7	-17.5
<i>Tanzania</i>										
NRA, agricultural	—	—	—	—	-59.6	-68.2	-55.4	-32.3	-31.7	-20.1
NRA, nonagricultural	—	—	—	—	35.5	69.9	39.8	16.6	11.9	10.3
RRA	—	—	—	—	-70.3	-81.3	-68.1	-41.3	-38.9	-27.6

<i>Uganda</i>										
NRA, agricultural	—	-4.6	-8.6	-24.3	-70.6	-22.8	-25.1	-1.3	4.0	3.6
NRA, nonagricultural	—	9.6	19.4	34.9	68.1	53.6	52.9	21.6	31.0	26.1
RRA	—	-13.0	-23.1	-43.1	-82.1	-49.5	-50.6	-18.8	-20.6	-18.0
<i>Zambia</i>										
NRA, agricultural	—	-22.4	-33.3	-44.4	-58.4	-27.6	-69.7	-55.2	-36.2	-36.7
NRA, nonagricultural	13.8	16.1	20.0	27.6	34.5	24.1	24.2	21.2	13.5	6.4
RRA	—	-33.2	-43.8	-56.2	-68.8	-41.4	-75.2	-62.6	-43.8	-40.5
<i>Zimbabwe</i>										
NRA, agricultural	23.9	-38.5	-45.6	-44.2	-54.5	-46.7	-42.9	-45.2	-40.0	-72.9
NRA, nonagricultural	26.0	29.1	30.8	37.8	48.1	46.9	42.2	35.9	20.9	20.2
RRA	-1.7	-52.3	-58.3	-59.5	-69.1	-63.4	-59.8	-59.5	-50.6	-77.3
<i>African countries, unweighted averages^a</i>										
NRA, agricultural	3.1	-10.9	-19.7	-20.6	-26.2	-21.5	-13.9	-13.9	-9.3	-9.4
NRA, nonagricultural	18.8	13.1	12.6	23.5	27.0	27.3	23.0	18.8	15.2	14.5
RRA	-13.2	-21.2	-28.7	-35.5	-41.8	-38.2	-29.7	-27.5	-21.2	-20.9
<i>African countries, weighted averages^b</i>										
NRA, agricultural	-24.1	-13.3	-19.5	-24.9	-22.0	-13.5	0.1	-15.3	-8.7	-11.9
NRA, nonagricultural	19.9	3.2	2.3	0.9	4.8	0.8	8.6	2.2	1.6	6.6
RRA	-36.8	-14.8	-21.1	-25.6	-25.2	-12.5	-7.5	-16.6	-10.1	-17.4
Dispersion of RRA ^c	40.7	24.0	24.3	22.7	35.6	42.4	45.2	28.6	23.3	20.0

Source: Anderson and Valenzuela (2008) based on estimates reported in chapters 2–17 of this book.

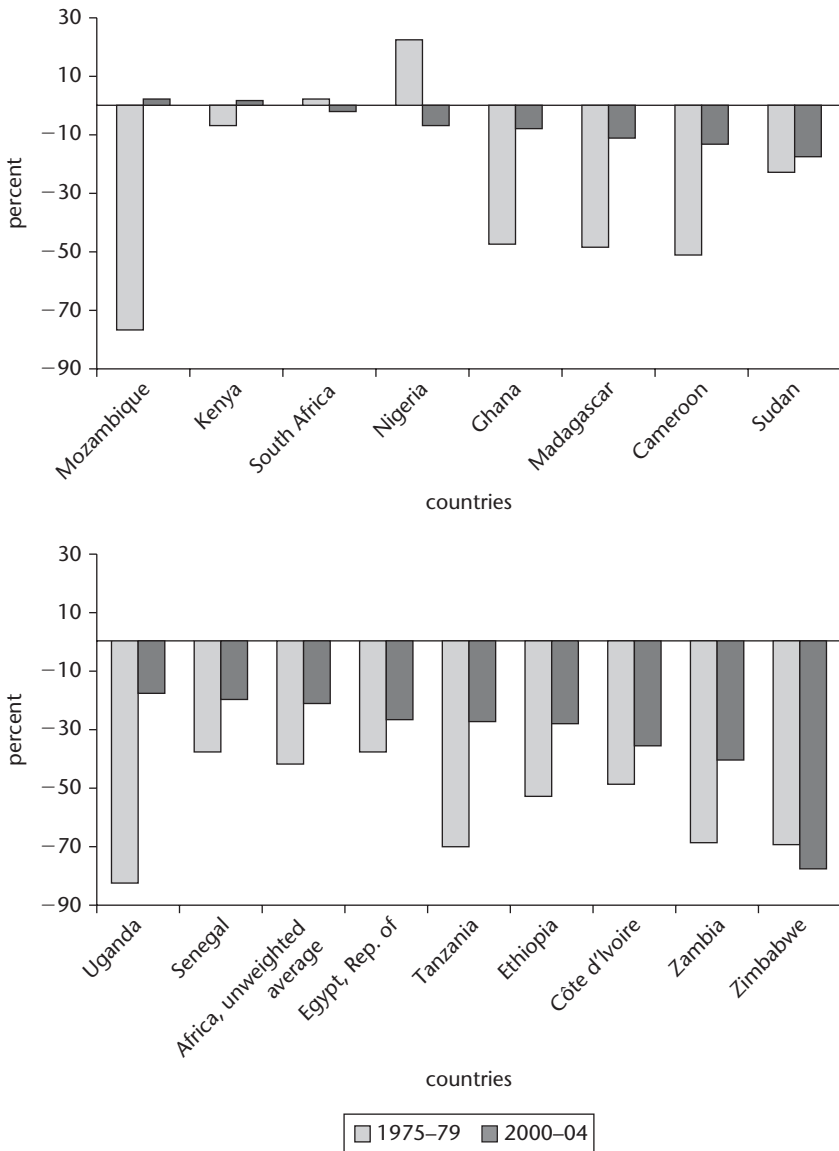
Note: For a definition of the RRA, see table 1.13, note c. For Cameroon, Côte D'Ivoire, Nigeria, Senegal, Uganda, and Zambia: 1960–64 = 1961–64. For Tanzania: 1975–79 = 1976–79. For Ethiopia: 1980–84 = 1981–84. — = no data are available.

a. Simple averages of the above (weighted) national averages.

b. Weighted averages of the above national averages, using weights based on gross value of national agricultural production at undistorted prices.

c. Dispersion is a simple five-year average of the standard deviation around a weighted mean of the national RRAs each year.

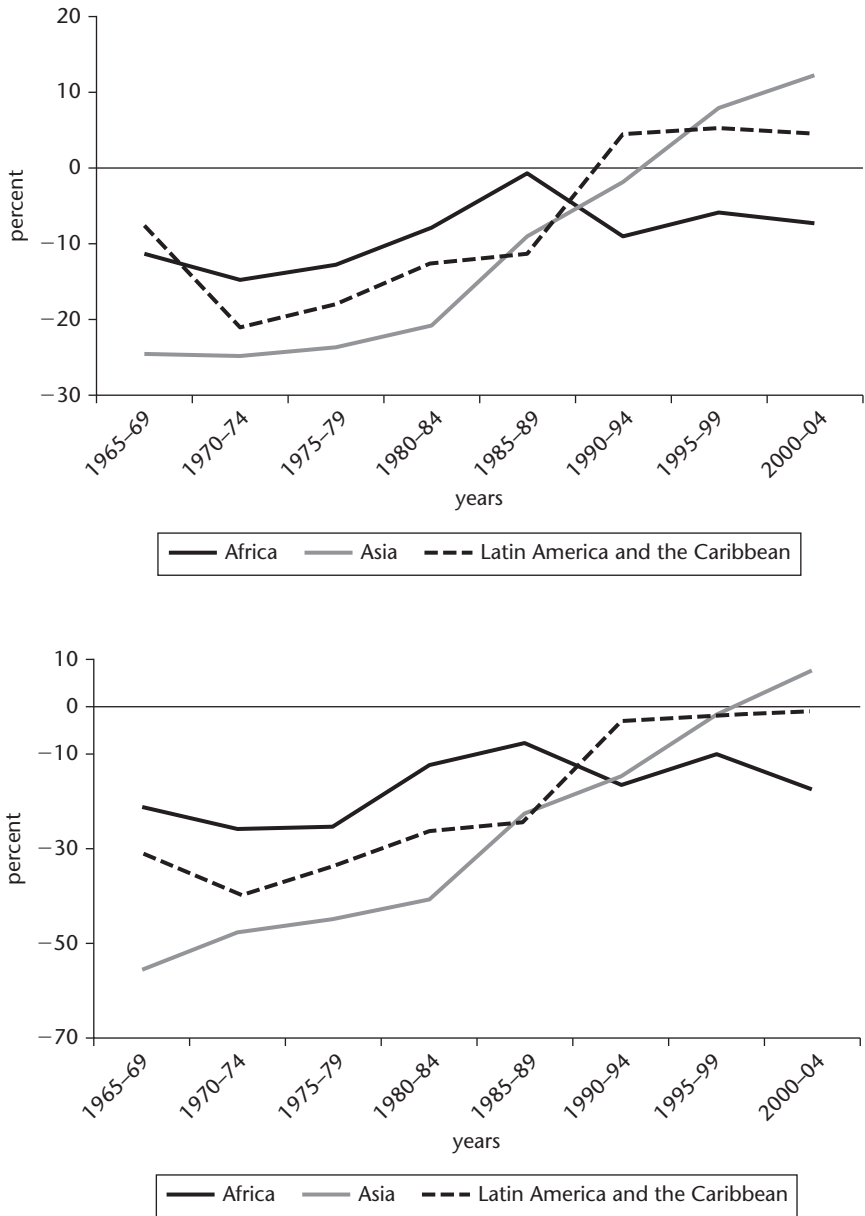
Figure 1.7. RRAs in Agriculture, 16 African Countries, 1975–79 and 2000–04



Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–17 of this book.

Note: For a definition of the RRA, see table 1.13, note c. Data for Ethiopia for the first period are for years 1981–84.

Figure 1.8. NRAs and RRAs, Asia, Africa, and Latin America, 1965–2004

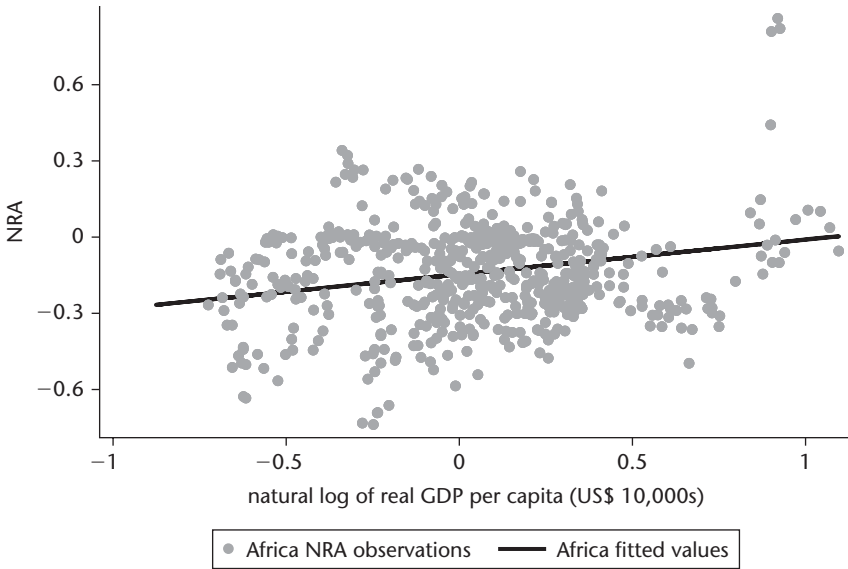


Source: Anderson and Valenzuela 2008.

Note: The NRAs and RRAs are five-year averages weighted by the value of production at undistorted prices as weights. For China, the NRAs and RRAs for 1965–81 have been extrapolated back based on the assumption that they were the same as the average for 1981–84.

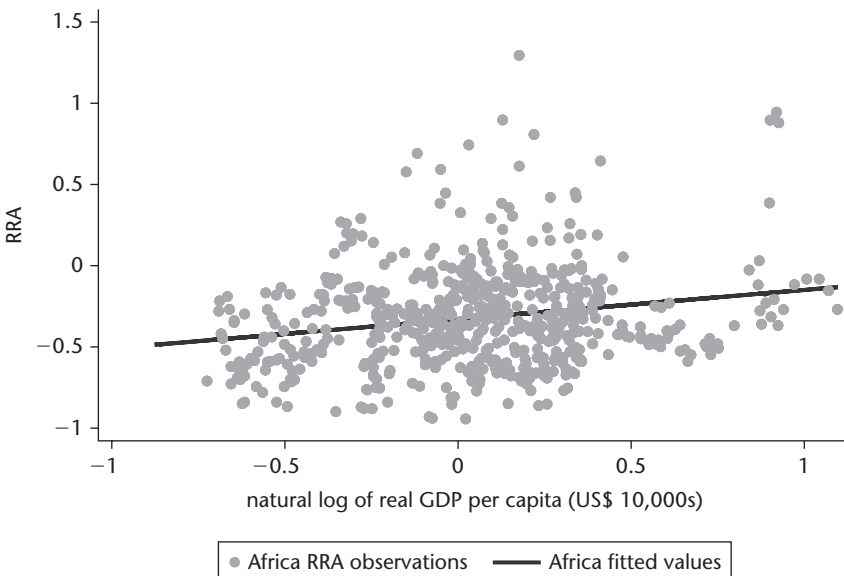
Figure 1.9. Real GDP Per Capita, Comparative Advantage, and NRAs and RRAs, 16 African Countries, 1955–2005

a. Regression of NRA on log real GDP per capita, with country fixed effects



Coefficient: 0.13. Standard error: 0.04. R^2 : 0.03.

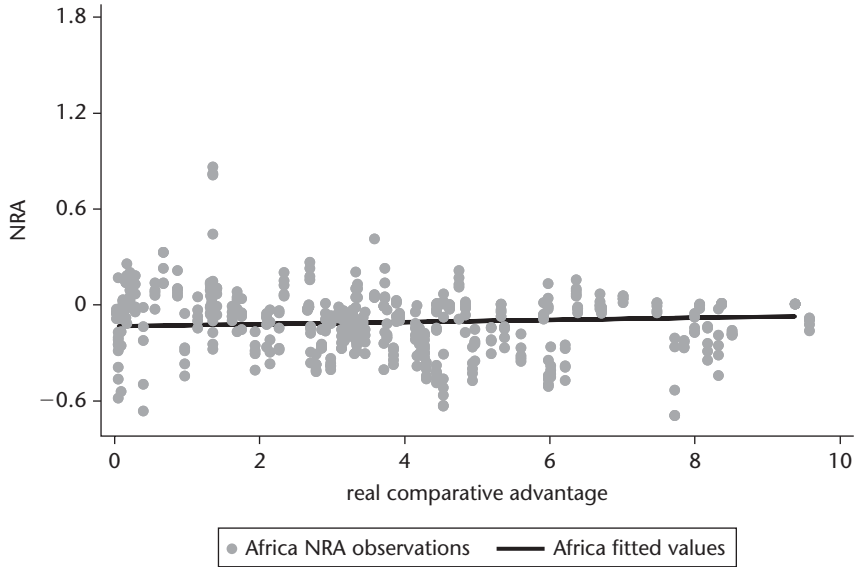
b. Regression of RRA on log real GDP per capita, with country fixed effects



Coefficient: 0.18. Standard error: 0.05. R^2 : 0.04.

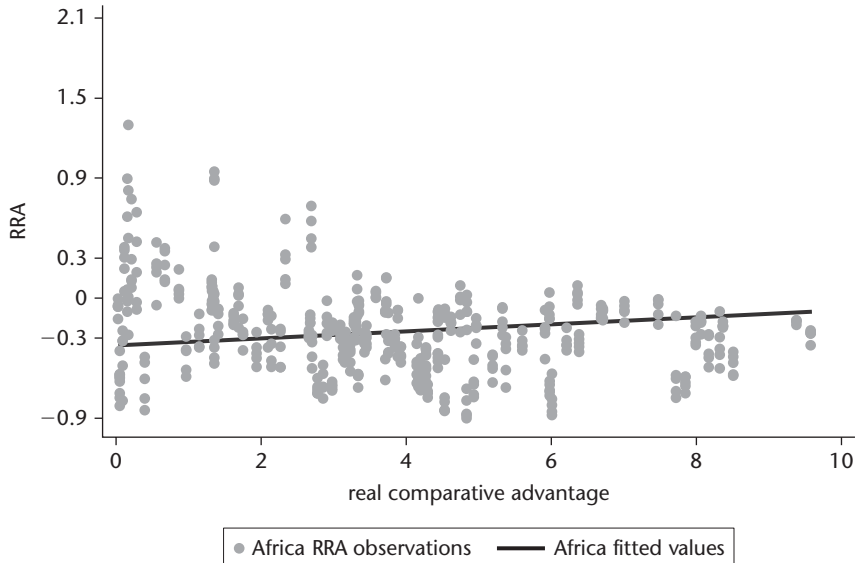
Figure 1.9. (continued)

c. Regression of NRA on revealed comparative advantage, with country fixed effects



Coefficient: 0.01. Standard error: 0.01. R^2 : 0.03.

d. Regression of RRA on revealed comparative advantage, with country fixed effects



Coefficient: 0.03. Standard error: 0.01. R^2 : 0.07.

Source: Based on data in Anderson and Valenzuela 2008, which draws on estimates reported in chapters 2–17 of this book, and in Sandri, Valenzuela, and Anderson 2007.

Note: The dependent variable for the regressions is the sector's NRA or RRA by country and year, expressed as a fraction. The results are ordinary least squares estimates. The revealed comparative advantage is the share of agriculture and processed food in national exports as a ratio of that sector's share of global exports.

Table 1.19. NRAs and Some of Their Determinants, 21 African Focus Countries, 1960–2004

Explanatory variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ln GDP per capita	0.14* (0.02)	0.10* (0.02)	0.15* (0.02)	0.20* (0.02)	0.02 (0.04)	0.02 (0.04)	0.04 (0.05)	0.15* (0.05)	0.13* (0.04)	0.14* (0.04)	0.18* (0.06)	0.17* (0.06)
Ln GDP per capita squared	0.15* (0.04)	0.09* (0.03)	0.01 (0.04)	0.04 (0.04)	0.57* (0.05)	0.57* (0.05)	0.69* (0.07)	0.62* (0.07)	0.49* (0.06)	0.51* (0.05)	0.50* (0.08)	0.54* (0.08)
Importables		0.04* (0.02)	0.09* (0.02)	0.09* (0.02)		0.08* (0.02)	0.15* (0.02)	0.12* (0.02)		0.08* (0.02)	0.15* (0.02)	0.13* (0.02)
Exportables		-0.35* (0.01)	-0.35* (0.02)	-0.35* (0.02)		-0.31* (0.01)	-0.30* (0.02)	-0.31* (0.02)		-0.33* (0.01)	-0.30* (0.02)	-0.31* (0.02)
Revealed comparative advantage ^a				0.01 (0.00)				0.03* (0.01)				0.02* (0.01)
Trade specialization index ^b			-0.05 (0.02)				0.01 (0.03)				0.09* (0.04)	
Constant	-0.16* (0.01)	-0.01 (0.01)	0.02 (0.02)	-0.03 (0.02)	-0.22* (0.01)	-0.10* (0.01)	-0.12* (0.02)	-0.24* (0.03)	-0.14* (0.04)	-0.38* (0.04)	-0.42* (0.05)	-0.40* (0.08)
R ²	0.02	0.18	0.20	0.19	0.03	0.18	0.18	0.18	0.13	0.27	0.28	0.28
Number of observations	5372	5372	3788	3838	5372	5372	3788	3838	5372	5372	3788	3838
Country-fixed effects	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time-fixed effects	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes

Source: Authors' estimates.

Note: The dependent variable for regressions is the NRA by commodity, country, and year. Results are ordinary least squares estimates. The main explanatory variable is Ln GDP per capita in US\$10,000s.

a. For a definition of revealed comparative advantage, see table 11.1, note a.

b. For a definition of the trade specialization index, see table 1.1, note b.

* Significance at the 99 percent level. Standard errors are shown in parentheses.

Consumer tax equivalents of agricultural policies

The extent to which farm policies alter the retail prices of food, livestock feed, or inputs into processing industries depends on various intervening factors, including the extent of competition along the value chain. For simplicity, like the OECD (2007), we ask only how policies affect buyers at the point on the value chain where the farm product is first traded internationally. That is the point where the most direct comparisons can be made between domestic and international prices (such as the price for milled rice or raw sugar). Then, to sum up the CTEs across commodities and countries, we use consumption values from national sources or from the FAO food balance sheets. In the case of minor products, we proceed indirectly by using FAO value-of-trade data and assuming the undistorted value of consumption is production valued at undistorted prices plus imports minus exports.

If there were no farm input distortions and no domestic output price distortions so that the NRA was entirely the result of border measures such as an import or export tax or restriction, and if there were no domestic consumption taxes or subsidies in place, then the CTE would equal the NRA for each covered product. But such domestic distortions are present in several African countries. In addition, the value of consumption weights used in obtaining the CTEs are quite different from the value of production weights used for obtaining weighted average NRAs (both measured at undistorted prices). Hence, the average CTEs are quite different from the average NRAs for numerous countries, particularly those exporting cash crops in order to import staple foods. This difference can be seen by comparing the country and product CTEs in table 1.20 with the corresponding NRAs in tables 1.10 and 1.12. Nonetheless, the weighted average CTE for the region has moved much like the NRA: starting at around -10 percent at the time of independence, falling to -17 percent (that is, a 17 percent consumer subsidy equivalent) by the early 1970s, and then gradually lessening and eventually nearing zero (with a blip in the latter 1980s, when Egypt overshot in its reform efforts to reduce the suppression of domestic food prices just when the international price of food fell to record low levels). The variance both in national CTEs within countries and in product CTEs across countries also rose before the reforms and fell after the late 1980s (see table 1.20a and 1.20b, including the bottom row of each).

In dollar terms, the subsidies to consumers of farm products in Africa are largest in Ethiopia and Sudan, while the tax on consumers historically has been largest in Nigeria and South Africa. Egypt before its reforms in the 1980s was also a huge subsidizer of food consumers. For the region in 2000–04, the transfer on average from producers to consumers amounted to around \$1.7 billion a year, which is only one-third (when expressed in 2000 U.S. dollars) the average annual transfer in the 1970s (table 1.21a). Among the covered products, the diversity in measures across the continent means that no products stand out as having extreme NRAs (table 1.21b), unlike in other regions, where the biggest transfers are from consumers to producers of milk, rice, and sugar.

Table 1.20. CTEs for Covered Farm Products, 21 African Focus Countries, 1960–2004*(percent, at primary product level)*

a. Aggregate CTEs, by country

Country	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Benin	—	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burkina Faso	—	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cameroon	–0.4	–0.7	–1.3	–3.7	–3.7	–1.1	–0.4	–0.2	0.0
Chad	—	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Côte d’Ivoire	–9.4	–20.1	–8.4	3.8	–10.8	–3.9	–4.6	–4.3	–3.8
Egypt, Arab Rep. of	–47.1	–49.5	–49.6	–20.8	–12.3	109.5	–2.7	13.9	–2.8
Ethiopia	—	—	—	—	–15.2	–17.6	–20.3	–12.1	–10.0
Ghana	–2.1	–4.4	–2.5	–4.6	1.7	10.2	4.0	0.8	2.8
Kenya	26.1	21.3	–12.8	20.7	26.0	14.8	–14.6	12.0	18.7
Madagascar	–15.9	–22.1	–19.2	–26.2	–42.4	–13.4	–1.2	–1.9	4.0
Mali	—	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mozambique	—	—	—	–50.5	–39.6	–53.4	–3.6	5.5	31.1
Nigeria	31.2	23.1	14.0	9.0	4.3	15.2	5.6	7.4	0.9
Senegal	–10.8	–10.3	–30.2	–25.2	–18.3	32.0	31.9	–6.0	–7.0
South Africa	4.0	10.2	–0.2	6.7	29.8	14.7	8.6	6.6	–0.6
Sudan	–15.2	–28.9	–41.8	–16.8	–24.2	–30.1	–47.7	–21.2	–5.2
Tanzania	—	—	—	–42.0	–53.7	–41.3	–17.5	–23.1	–8.8
Togo	—	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Uganda	–1.0	–1.8	–1.1	–1.3	1.0	–0.9	0.3	1.7	1.3
Zambia	–26.7	–38.5	–46.3	–54.3	–20.8	–68.0	–54.4	–30.5	–31.3
Zimbabwe	–28.7	–35.4	–40.1	–53.7	–39.4	–37.1	–42.4	–36.6	–63.7
Unweighted average	–7.4	–12.1	–13.3	–12.7	–10.4	–3.3	–7.6	–4.2	–3.6
Weighted average ^a	–7.8	–11.8	–16.6	–8.7	–6.1	15.5	–8.2	–0.5	–3.2
Dispersion of national CTEs ^b	21.3	22.8	19.8	22.7	21.6	40.6	19.9	13.9	17.9

b. Aggregate CTEs, by product

Product	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Banana	-2	-4	0	-2	-1	-1	3	5	2
Bean	6	2	-3	-37	-48	-64	-25	-24	-19
Beef	-21	-28	-36	7	18	48	-32	6	-21
Cassava	0	0	0	-1	-3	-1	1	3	3
Cocoa	-31	-46	-43	-60	-48	-34	-20	-22	-34
Coffee	-35	-41	-43	-59	-50	-46	-47	-37	-14
Cotton	-46	-54	-55	-50	-43	-31	-55	-40	-58
Groundnut	-22	-36	-47	-41	-39	-12	-26	-32	-36
Maize	15	3	-3	1	10	48	10	4	-2
Milk	-23	-32	-42	-1	-22	67	-27	-8	19
Millet	-3	-4	-2	0	2	3	4	6	6
Palm oil	-25	-31	-45	-19	-29	-13	107	41	-17
Plantain	0	0	0	0	0	0	0	0	0
Poultry	-11	-11	-12	-24	18	-3	6	13	-2
Rice	-27	-33	-16	-10	-9	41	9	2	10
Sesame	-45	-56	-58	-61	-51	-38	-38	-40	-38
Sheep meat	-7	-13	-17	-14	-12	-32	-47	-36	-18
Sorghum	102	94	73	56	34	69	68	38	40
Soybean	—	-14	-32	-43	-43	-41	-53	-51	-56
Sugar	-2	11	-16	-10	-6	54	-2	6	45
Sunflower	19	17	6	8	19	13	13	0	1
Tea	10	-6	-22	-46	-32	-27	-41	-40	-36

(Table continues on the following page.)

Table 1.20. CTEs for Covered Farm Products, 21 African Focus Countries, 1960–2004 (continued)

b. Aggregate CTEs, by product (continued)

Product	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Tobacco	–39	–38	–49	–57	–50	–50	–34	–37	–46
Vanilla	—	—	—	—	—	—	—	—	—
Wheat	–36	–22	–19	–2	–14	34	8	3	–1
Yam	0	0	0	–1	–1	0	1	3	3
Weighted average ^a	–8	–12	–17	–9	–6	16	–8	0	–3
Dispersion of region's product CTEs ^c	30.3	30.4	28.0	30.3	27.9	41.9	36.9	26.4	27.4

Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–18 of this book.

Note: The table reflects the assumption that the CTE is the same as the NRA derived from trade measures (that is, not including any input taxes, input subsidies, or domestic producer price subsidies or taxes). For Cameroon, Côte D'Ivoire, Nigeria, Senegal, Uganda, and Zambia: 1960–64 = 1961–64. For Tanzania: 1975–79 = 1976–79. For Ethiopia: 1980–84 = 1981–84. — = no data are available.

- Weights are consumption valued at undistorted prices, where consumption (from the FAOSTAT Database) is the sum of production plus imports net of exports plus change in stocks of the covered products.
- Simple five-year average of the annual standard deviation around a weighted mean of the national average CTEs.
- Simple five-year average of the annual standard deviation around a weighted mean of the regional average CTE for the covered products shown above.

Table 1.21. Value of CTEs of Policies Assisting Producers of Covered Farm Products, 21 African Focus Countries, 1965–2004

(constant 2000 US\$ millions, at the primary product level)

a. Aggregate CTEs, by country

Country	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Benin	—	0	0	0	0	0	0	0
Burkina Faso	—	0	0	0	0	0	0	0
Cameroon	–12	–24	–57	–30	–8	–5	–3	0
Chad	—	0	0	0	0	0	0	0
Côte d'Ivoire	–139	–65	39	–151	–54	–76	–63	–42
Egypt, Arab Rep. of	–2,950	–3,891	–2,196	–1,631	9,315	–224	1,087	–221
Ethiopia	—	—	—	–1,014	–1,435	–1,427	–944	–759
Ghana	–31	–33	–44	78	116	59	18	61
Kenya	19	–71	282	241	75	–143	91	134
Madagascar	–137	–321	–282	–386	–93	–9	–16	34
Mali	—	0	0	0	0	0	0	0
Mozambique	—	—	–206	–183	–152	–19	58	164
Nigeria	1,338	1,011	947	769	1,495	755	1,209	111
Senegal	–51	–226	–334	–177	253	190	–32	–38
South Africa	310	–145	323	1,534	627	440	346	–14
Sudan	–792	–1,874	–898	–1,557	–2,136	–3,073	–1,265	–442
Tanzania	—	—	–993	–730	–393	–139	–397	–165
Togo	—	0	0	0	0	0	0	0
Uganda	–24	–20	–25	46	–17	7	49	37
Zambia	–160	–188	–310	–128	–214	–191	–136	–180
Zimbabwe	–125	–216	–482	–321	–239	–270	–217	–408
African focus countries ^a	–2,754	–6,063	–4,038	–3,450	7,138	–4126	–215	–1,729

(Table continues on the following page.)

Table 1.21. Value of CTEs of Policies Assisting Producers of Covered Farm Products, 21 African Focus Countries, 1965–2004 (continued)

b. Aggregate CTEs, by product

Product	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Banana	-1	0	-1	0	-1	6	8	0
Bean	1	-3	-231	-211	-189	-54	-132	-127
Beef	-787	-1,415	176	908	2,861	-2,087	264	-1,247
Cassava	-5	-10	-50	-189	-43	33	293	200
Cocoa	-15	-24	-118	-47	-38	-44	-82	-138
Coffee	-68	-83	-111	-175	-223	-151	-146	-30
Cotton	-1,170	-1,658	-2,126	-1,212	-742	-1,401	-654	-756
Groundnut	-360	-759	-889	-698	-135	-345	-486	-595
Maize	67	-262	76	576	2,497	627	306	-246
Milk	-350	-609	-10	-451	1,019	-522	-258	375
Millet	-53	-33	6	26	40	58	89	80
Palm oil	-116	-156	-148	-146	-95	387	185	-112
Plantain	0	0	0	0	0	2	4	2
Poultry	-30	-70	-259	185	-17	83	206	61
Rice	-506	-756	-347	-352	955	219	45	206
Sesame	-45	-119	-155	-110	-47	-35	-42	-22
Sheep meat	-105	-232	-212	-187	-424	-662	-499	-106
Sorghum	1,223	1,138	940	599	864	706	615	430

Soybean	0	-1	-10	-24	-19	-22	-26	-23
Sugar	52	-355	-345	-392	571	-32	60	521
Sunflower	6	1	12	26	12	16	0	6
Tea	-1	-4	-24	-24	-16	-20	-18	-15
Tobacco	-65	-27	-74	-35	-39	-38	-14	-41
Vanilla	—	0	-5	-8	-38	-9	-2	-17
Wheat	-341	-528	-96	-837	2,120	463	209	-49
Yam	-4	-14	-37	-81	-13	30	249	179
All covered products ^{a,b}	-2,754	-6,063	-4,038	-3,450	7,138	-4,126	-215	-1,729

Source: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–18 of this book.

Note: For Cameroon, Côte D'Ivoire, Nigeria, Senegal, Uganda, and Zambia: 1960–64 = 1961–64. For Tanzania: 1975–79 = 1976–79. For Ethiopia: 1980–84 = 1981–84. Because of this, the totals in tables a and b in these three time periods might not match exactly. — = no data are available.

- a. These dollar amounts do not include noncovered farm products, which amount to almost one-third of agricultural output (see last row of table 1.11) nor any markup that might be applied along the value chain.
- b. These data include also all the minor covered products not shown above.

The link between antifarm and antitrade policies

A visual picture of the overall finding—that distortions have been reduced substantially since the 1970s—is provided in figure 1.10. That figure shows values of agriculture's trade bias index on the horizontal axis and the relative rate of assistance on the vertical axis. An economy with no antiagricultural bias ($RRA = 0$) and no antitrade bias within the farm sector ($TBI = 0$) would be located at the intersection of the two axes in the upper right-hand corner. In 1975–79, South Africa was the only economy anywhere near that point, and most other Sub-Saharan African economies were far to the southwest of it. In 2000–04, by contrast, Kenya and Nigeria were also close to that neutrality point, and all the other countries shown were far closer than they were in the 1970s. This is not to say that few distortions are left within the agricultural sector, however, because RRA and TBI values in the ranges of -20 to -40 and -0.2 to -0.4 , respectively, are not small, and because within most countries' agricultural sector, product NRAs are still widely dispersed. Note also from figure 1.10 that the 2000–04 values fit roughly along a 45-degree line, because the tax burden on agriculture in these countries consists primarily of taxes on trade.

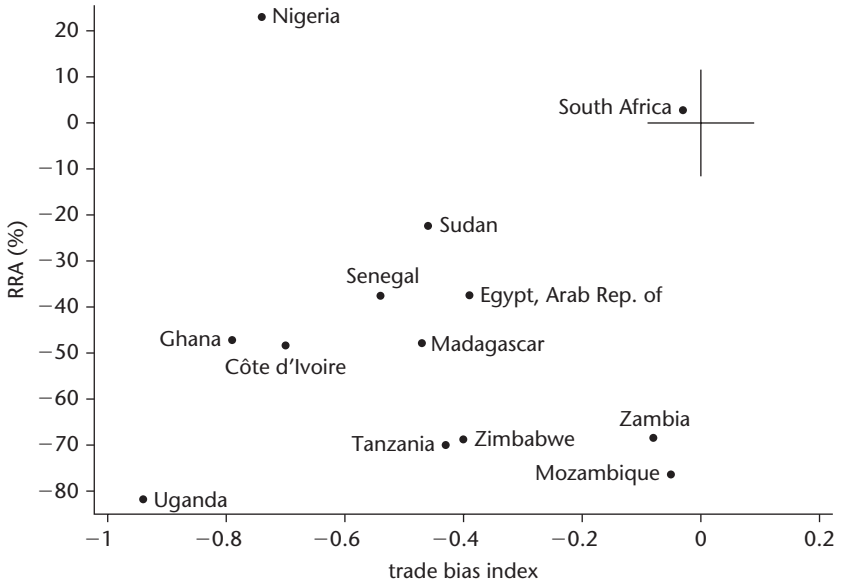
International spillovers and multilateral agreements

The distortion estimates take each country's border prices as given, but in reality each country's policies do have some small effect on other country's prices. An import restriction that raises domestic prices will lower prices elsewhere, and an export tax that lowers domestic prices will raise them elsewhere. In addition, attempts by one country to stabilize its domestic prices over time will reduce the stability of international prices. As a result, each country's openness to trade contributes to an international public good, offering other countries more favorable and often more stable border prices. This is a classic collective-action problem, calling for a multilateral agreement to lock in freer trade policies.

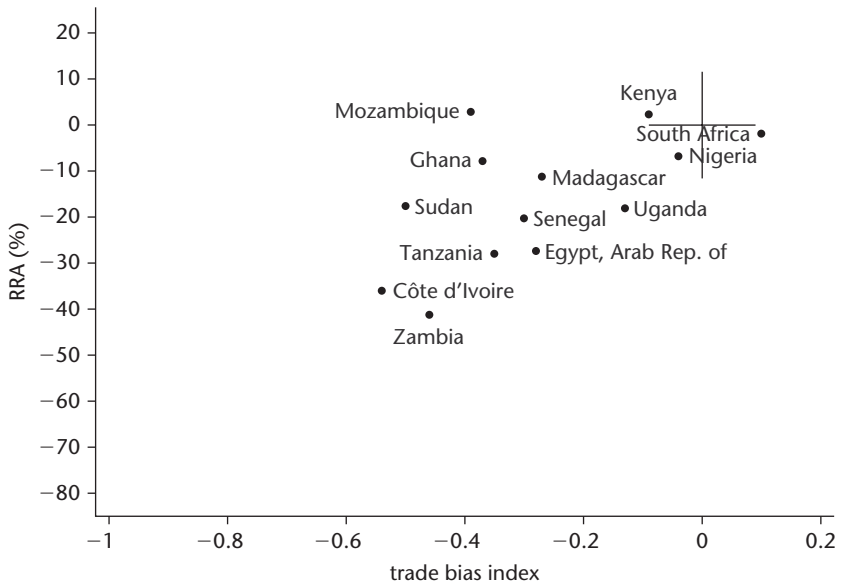
Collective action to stabilize world prices is precisely what was sought during the GATT's Uruguay Round Agreement on Agriculture, through tariff bindings and disciplines on administered domestic prices. Tariff bindings can reduce the extent of spillovers by restricting the range over which tariffs can increase in response to low prices. But WTO bindings are now so far above applied import tariffs that this discipline on food-importing members in years of low international prices is very weak. The most recent stage of the Doha round of WTO-sponsored multilateral trade negotiations broke down in mid-2008 because many developing countries were calling for policy space in the form of a special safeguard mechanism that would have allowed even more scope for limiting imports—something richer members including the United States were not willing

Figure 1.10. Relationship between the RRA and the Trade Bias Index for Agriculture, 16 African Focus Countries, 1975–79 and 2000–04

a. 1975–79



b. 2000–04



Sources: Anderson and Valenzuela 2008, based on estimates reported in chapters 2–17 of this book.

to sanction in a new agreement. Moreover, there is no corresponding GATT/WTO discipline on food export restrictions, which, as 2008 has starkly revealed, can be a problem in years of high international prices.

Africa's share of world trade is so small that its policies contribute relatively little to the collective-action problem described above, except to the extent that African governments have sided with such countries as Indonesia and India in demanding special safeguards, thereby delaying or preventing the emergence of a new WTO agreement. As the victim rather than the perpetrator of international agricultural-policy spillovers, however, Africa could benefit greatly from a more effective system of multilateral trade rules. International agreements may also help African governments undertake reforms that would not otherwise be possible, allowing them to make commitments and assemble coalitions that cannot otherwise be sustained. The details of WTO and other international agreements are outside the scope of this book, but generally our results regarding national policies suggest that multilateral agreements can help each government deliver more favorable market conditions for agricultural development at the very least by limiting the rise of import restrictions in other countries. In addition, following the imposition by numerous food-exporting developing countries in 2008 of export restrictions that harmed food importers, perhaps WTO members may eventually agree to limit export restrictions as well.

Summary: What have we learned?

Each of the case studies presented in this volume provides detailed insights into Africa's wide variety of country experiences. Aggregating their results to characterize all of Africa necessarily obscures as much as it reveals. Making generalizations is sometimes useful, however, if only to allow comparison with other regions and to detect common trends that cannot be seen in individual cases. Averaging over the 21 African countries considered in this study, our principal findings are the following.

African governments have removed much of their earlier antifarm and antitrade policy biases. Government policy biases against agriculture had worsened in the late 1960s and 1970s, primarily through increased taxation of exportable products. Reforms of the 1980s and 1990s reversed that trend, and average rates of agricultural taxation are now back to or below the levels of the early 1960s.

Substantial distortions remain and still impose a large tax burden on Africa's poor. Measured in constant (2000) U.S. dollars, the transfers paid by farmers in the 21 focus countries peaked in the late 1970s, at over \$10 billion a year, or \$134 for each farm worker. In 2000–04, the burden of taxation averaged \$6 billion a year, or \$41 for each person working in agriculture. However, even this lower amount is

appreciably larger than public investment in or foreign aid to the sector. This continuing taxation in Africa contrasts with both Asia and Latin America, where the average agricultural NRAs and RRAs had risen all the way to zero by the early 21st century from lower levels than in Africa (although, like Africa, those other regions still have a wide dispersion of NRAs across products and countries within their regions).

African farmers have become less taxed in part because of the changing trade orientation of African agriculture. Reduced taxation of farmers has occurred in part because of a decline in the share of output that is exportable and a corresponding rise in the share from import-competing agricultural industries. That subsector's rate of protection from imports has fluctuated but remains positive.

Trade restrictions continue to be Africa's most important instruments of agricultural intervention. Other interventions such as domestic taxes and subsidies on farm inputs and outputs and non-product-specific assistance are a small share of total distortions to farmer incentives in Africa. As a result, policy incidence on consumers tends to mirror the incidence on producers, with fiscal expenditures playing a much smaller role than in more-affluent regions.

Differences in NRAs and RRAs across commodities and countries are still substantial. Dispersion rates, as measured by the standard deviation in NRAs and RRAs across commodities and countries, rose and then fell with the average degree of intervention in the decades on either side of the 1970s. Looking forward, whatever the overall level of taxation or assistance, moving toward more uniform rates within the farm sector and between countries within the region could still yield substantial increases in efficiency of resource use.

Implications for the Future

Readers of this volume will draw their own conclusions as to what these findings imply about the future of agricultural policy in Africa, and wide variations in NRAs among countries will no doubt continue. We hope that, despite difficult conditions, many African governments will continue to reduce taxation of agricultural exports, improve market institutions, and invest in rural public goods, and that producers will respond in ways that generate faster economic growth and sustained poverty alleviation. That has been the pattern in other regions, and African countries have shown their willingness and ability to begin these changes.

Our hopes are tempered by experience, however, including particularly the experience of agricultural policy transition in other regions. A fundamental concern in agricultural policy over time as economies join the middle-income group is "overshooting." In response to rural poverty and inequality, many countries start protecting agriculture soon after they stop taxing it.⁶ This protection

imposes large costs on consumers and slows national economic growth. Countries that lock in relatively efficient and equitable policies as soon as they are attained can therefore enjoy a high payoff relative to those that allow farm support policies to become increasingly costly over time. In particular, policies that raise the prices of staple foods impose serious costs on the urban poor and on rural net buyers of these products, as has been demonstrated by recent increases in their prices for other reasons (Ivanic and Martin 2008).

Rural-urban poverty gaps can be addressed in far more efficient ways than by subsidizing production or raising food prices. For example, rural poverty can and has been alleviated in parts of Africa and Asia by the mobility of some members of farm households who work full- or part-time off the farm and repatriate part of their higher earnings to those remaining on the farm (Otsuka and Yamano 2006; World Bank 2007). Concerted government interventions through targeted social policy measures can also be an efficient and effective way to reduce gaps between rural and urban incomes and raise national incomes overall (Winters, McCulloch, and McKay 2004). Efficient ways of assisting the left-behind groups of poor (non-farm as well as farm) households include public investment measures that have high social payoffs such as basic education and health care, rural infrastructure, and agricultural research and extension.

The rest of this volume contains a collection of analytical narratives of the policy experiences of 21 African countries over the past half century, each illustrated by detailed quantitative estimates of the extent of distortions to farmer incentives. While they bring new empirical evidence to bear on many common concerns, they inevitably also raise new questions. Among the most important are: What impact have past and recent policies had on economic welfare, agricultural prices, income inequality, and poverty? Why did governments intervene in the ways they did, especially when some of those means were grossly inefficient and inequitable? More in-depth empirical analysis is now possible, thanks to the provision of the distortion estimates reported here and in the three companion volumes cited in note 1. Some early findings from such analyses will appear in the project's forthcoming books. For example, Anderson, Valenzuela, and van der Mensbrugghe (forthcoming) provide results from a global economy-wide model of the impacts on agricultural markets, national economic welfare, and net farm incomes of distortions to the world's goods markets as of 2004. How those distortions, both own-country and rest-of world's, affect the extent of poverty and inequality are explored in a series of country case studies in Anderson, Cockburn, and Martin (forthcoming), using global and national economy-wide models that are enhanced with detailed earning and spending information of numerous types of urban and rural households. And in Anderson (forthcoming b), a broad range of theoretical and econometric analyses are brought together in an attempt to shed

more light on the political economy forces that generated the evolving pattern of inter- and intrasectoral distortions to farmer and food consumer incentives over the past half century. Our hope is that the results from these studies will spawn many more such analyses in the years to come. We hope too that these comparative analyses will help African governments to adopt more successful policies, allowing African countries to achieve faster economic growth, poverty alleviation and improved living conditions for all.

Notes

1. The other three regional studies are Anderson and Martin (2008), Anderson and Swinnen (2008), and Anderson and Valdés (2008). Together with the present volume and comparable studies of high-income countries, they form the basis for a global overview volume (Anderson forthcoming a).

2. Our definition of a policy-induced price distortion follows Bhagwati (1971) and Corden (1997) and includes any policy measure at a country's border (such as a trade tax or subsidy, a quantitative restriction on trade, or a dual or multiple foreign exchange rate system, assuming the country is small enough to have no monopoly power in international markets). It also includes any domestic producer or consumer tax; subsidy; or restraint on output, intermediate inputs, or primary factors of production (except where it is needed to directly overcome an externality, or where it is set optimally across all products or factors, for example as a value added tax to raise government revenue). For more on this project's methodology, see Anderson, et al. (2008).

3. Some analytics and empirical evidence regarding the appropriate choice of denominator are provided in Masters (1993).

4. Corden (1971) proposed that free-trade volumes be used as weights, but because they are not observable (and an economy-wide model is needed to estimate them), the common practice is to compromise by using actual distorted volumes but undistorted unit values or, equivalently, distorted values divided by $(1 + NRA)$. If estimates of own- and cross-price elasticities of demand and supply are available, a partial equilibrium estimate of the quantity at undistorted prices could be generated, but if those estimated elasticities are unreliable, this estimate may introduce more error than it seeks to correct.

5. Recall that our sample covers around 90 percent of Sub-Saharan Africa's economy. For North Africa, the sample includes only Egypt, which accounts for almost half the population of North Africa but only 37 percent of its GDP.

6. Details on this and other patterns in agricultural distortions data are provided in Anderson (forthcoming b).

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PART II

NORTH AFRICA

ARAB REPUBLIC OF EGYPT

*James Cassing, Saad Nassar,
Gamal Siam, and Hoda Moussa**

Egypt is an ancient civilization but with a certain geopolitical regularity where agriculture and incomes are concerned. Foremost, for over 50 centuries there has been an inexorable pressure of a growing population against fixed resources—land and water. Additionally, for a very long time, local central rulers and an assortment of foreign powers have used control over limited agricultural land as a source of political patronage and taxation aimed to achieve particular ends. Historically, this situation has disadvantaged the rural peasantry despite periodic infrastructure investments and the introduction of lucrative new crops such as Egyptian cotton in 1820.

This study focuses on the period 1955–2005. In the early part of that era, despite an articulation of concern for the rural population, a policy emphasis on industrialization and import substitution met with mixed success as promotion of industry, tempered especially by the 1952 revolution and ultimately Nasser socialism, reduced incentives to both the basic agricultural sector and to international trade. This antiagricultural and antitrade policy bias, in turn, has held important implications for the prosperity of the population generally and especially for rural incomes in a country where even today one-third of the population is in the agricultural sector and more than one-half might be characterized as rural. The period since the mid-1980s has been characterized by a policy reorientation away

* The authors are grateful for helpful comments from Steven Husted, Daniel Brent, and workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Cassing et al. (2007).

from state planning and toward reinvigorating the private sector, including agriculture.

Even though the current policy tendency leans clearly toward embracing markets and free enterprise, it is confronted with some burdensome legacies of the past. On the one hand, the government of Egypt is openly committed to the goal of increased incomes and employment for all Egyptians. To that end, it has actively pursued sensible policies of macroeconomic stability, along with a strong commitment to private sector development, privatization of state-owned firms, and legal reforms that affect investment. The government has also pursued a series of trade barrier reductions, including abolition of most quantitative restrictions and significant reductions in tariffs, especially for certain key capital goods, and entered a number of regional and global free trade commitments. Although there was some hesitation in policy reform and relative economic stagnation from 2000 to 2003, bold reform once again seems to be well on track (Srinivasan 2005; IMF 2006).

However, the legacy of the past is daunting for even well-intentioned policy reformers. Historically, by the middle of the 20th century, a long period of widely unpopular European influence had left wealth concentrated in the hands of foreigners and a domestic elite.¹ Following the revolution of 1952 that brought Gamal Abdel Nasser to power, and particularly after the sanctions following the Suez crisis of 1956, the economy was realigned structurally. The state assumed ownership of the means of production, and it regulated prices. The public sector soon accounted for 75 percent of gross domestic product (GDP), and with increased centralized planning came such things as directives about what a certain product should look like and how it should perform. At the same time, foreign companies were nationalized, which virtually shut off inflows of foreign investment.

In the 1970s, in response to slower growth, the government began an open-door policy with a more outward-looking orientation. Since the 1980s, the pace of economic reform has increased, with an emphasis on reliance on markets, increased foreign trade and investment, and, beginning in the 1990s, privatization. But the history of socialism and Egypt's trade orientation toward Comecon (Council for Mutual Economic Assistance) countries has left many Egyptians with a distrust of markets and of foreign trade. Add to this a stifling bureaucracy, and one can appreciate the difficulty in advancing deeply needed economic policy reforms.

Egyptian farmers grow a wide variety of crops—grains, cotton, sugar, berseem (clover), legumes, fruits, and vegetables—and also produce meats and dairy products. Over the years the agricultural and related sectors have been subject to significant policy interventions and large structural changes. For about 10 years after the 1952 revolution, agriculture continued to dominate output and employment, and cotton was the main export. The sector was driven by close-to-free-market incentives. Since about 1960, however, owing somewhat to both direct and indirect policy

interventions, agriculture has diminished in relative economic importance. Today it contributes only one-seventh of GDP, although agricultural employment remains disproportionately higher, at around one-third of national employment. Meanwhile, agricultural exports have declined substantially in importance and agricultural imports of the staples wheat and flour have increased dramatically. Combined with the politically sensitive policy of substantial bread subsidies to consumers, Egypt's food policy today represents a large and growing drain on government finances that is difficult to sustain.

As livestock production has become more important, maize has increased in both domestic cropping and in imports. Berseem production has expanded as well, while rice production, perhaps subsidized more than any other crop by a policy of free irrigation water, remains important for domestic consumption and has some importance as an export.

Although food security has always been and remains a priority, agricultural policies other than those pertaining to water are largely oriented toward institutionalizing market incentives in production and, except for bread and to some extent edible oil and sugar, in consumption. This is the reverse of policies of the 1960s and 1970s. In that earlier period, policy emphasized the mobilization of agricultural savings in order to subsidize the urban consumer and promote industrialization. During the Nasser era, the government also sought to alter the traditional biennial crop rotation, which was believed to be harsh on the land. Market distrust meant virtually all farmers became members of cooperatives. The cooperatives, in turn, were run by government bureaucracies solely entrusted to provide inputs to and buy outputs from farmers at artificially low administered prices.

The Principal Bank for Development and Agricultural Credit, originally established in 1931, became the instrument of allocation for agricultural trade and finance. At the same time, some land reforms and rent controls were implemented, along with government-dictated cropping patterns. Most social histories recount that the system was highly inefficient and somewhat corrupt, probably exploiting the rural peasantry to the benefit of a controlling class of "rural notables" at the village level. Certainly the agricultural sector was extremely repressed. Even relatively freely traded agricultural products—livestock, certain animal feeds, and some horticulture—suffered from high industrial trade protection and an overvalued currency.

Important market-oriented reforms began in 1986, the terminal year in the case study by Dethier in Krueger, Schiff, and Valdez (1991), and by 1994 the private sector was substantially enfranchised once again. Egypt by 2006 had engineered a remarkable, almost unprecedented, reversal of its agricultural policies. Nonetheless, as reported here, some indirect disincentives to the agricultural sector remain, and

the government continues to control the sugar sector. In addition, food consumer policy, particularly untargeted bread subsidies, remains problematic.

The remainder of this study attempts to amplify the policy discussion and to quantify its impacts on incentives. The study first provides a brief history of growth and structural changes in the Egyptian economy over the past 50 years. It then recounts the evolution of agricultural policy since 1955 before providing measures of the extent of distortions to incentives. An analytical narrative of policy evolution is followed by some conclusions concerning food policy, rural incomes, and the prospects for future national policy reform.

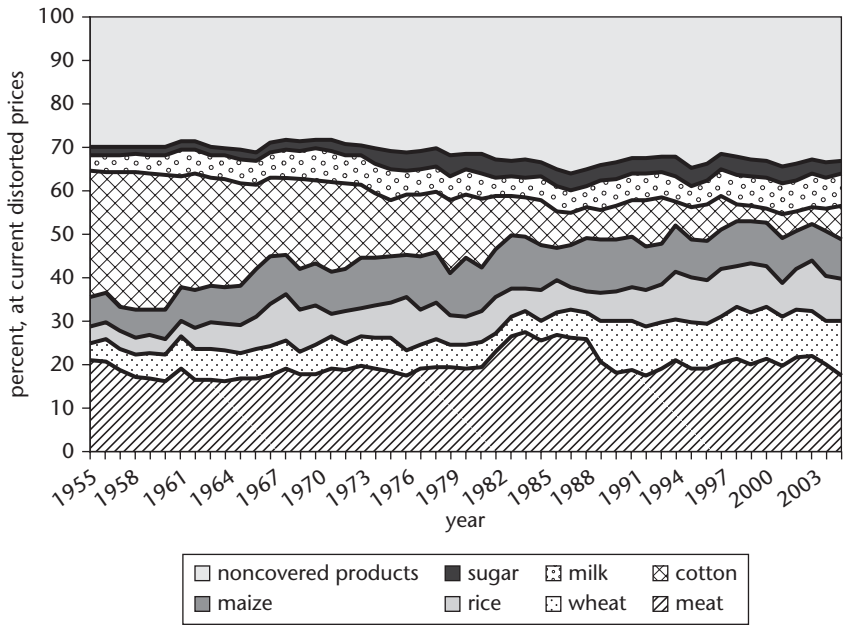
Growth and Structural Change in the Egyptian Economy, 1955 to 2005

Egypt's economy has grown unevenly over the past 50 years, driven by population growth as much as by investment, and structurally affected by significant policy swings. The period is marked first by the rapid nationalization of industry and the move toward import substitution and central planning and then by the equally rapid reorientation of the economy toward reliance on markets, private property, and integration into the world economy. These policy swings have applied to both the agricultural and nonagricultural sectors, although the emphasis on heavier industry in the early years clearly penalized agriculture indirectly. Also, in the reform period, which began in the 1970s, other reforms have been implemented more quickly than has the dismantling of import substitution policies and tariff escalation, so some bias against agriculture continues.

Demographically, the population grew from about 25 million to around 75 million over the past 50 years. The bulk of that growth was in the nonagricultural population, which rose from 30 percent to over 60 percent, although the rural population actually stayed proportionately constant at more than one-half the total population.

The population trend is reflected in the labor market, where the labor force grew from 6 million to 20 million, but the share employed in agriculture fell from over half to just one-third. With such rapid population growth, the population is demographically quite young, posing a challenge for the economy to absorb the burgeoning cohort of new entrants into the labor force.

Overall, GDP and especially GDP per capita have grown somewhat haltingly. Meanwhile, agriculture has fallen from 30 percent of GDP to about 14 percent, and manufacturing has grown to more than the size of the agricultural sector. Oil and gas, plus government and other services, account for the remaining share of GDP. The composition of primary agriculture by product over time for the 70 percent of products covered in this study (at current distorted prices) is shown in figure 2.1,

Figure 2.1. Product Shares of Agricultural Output, Egypt, 1955–2005

Source: Data compiled by the authors.

where the contraction of the cotton sector is evident and the growing importance of meat and horticulture are implicit as key parts of the noncovered products.

Exports and imports have been in secular decline. Except for a few commodities—cotton in the early period; gas and oil, Suez Canal services, garments, and tourism in the later years—Egypt has essentially disengaged from international commerce. As a share of GDP, merchandise exports have fallen from an average of over 10 percent before the 1990s to about 5 percent since the early 1990s. For imports, the comparable shares are 27 percent and 16 percent (World Bank 2006). Egypt's share of world trade was substantially larger in 1975 than it is today. Imports remain few, and the sum of exports plus imports as a share of GDP has fallen, raising the specter that economic reform has been somewhat biased against trade in that dismantling the import-substitution policy of yesteryear has received lower priority. Repatriated wages by Egyptians working abroad and foreign aid still make up a significant share of foreign exchange earnings. Foreign investment, which was all but frozen in the early years, remains fairly low relative to other developing countries, and some of it is driven by "tariff jumping" into heavily protected industrial sectors of the economy (Nathan Associates 2002).

The commodity composition of trade has changed considerably over the period. Agricultural products, mostly cotton, no longer dominate exports, while

gas and oil (“other primary exports”) have increased substantially since the return of the Sinai oil fields to Egyptian control after the 1973 Arab-Israeli war. Imports continue to be mostly manufactures, primarily capital goods and especially oil-industry-related, but food imports—especially wheat and flour—still represent 20 percent of merchandise imports despite a concerted effort to decontrol farm-gate prices and achieve self-sufficiency in flour for bread production.

The substantial antitrade bias in the foreign trade sector stems from a host of direct and indirect policy interventions, most notably significant tariff and non-tariff trade barriers escalating in favor of industry and from an overvalued exchange rate from the 1950s until about 1997. In the late 1990s, agricultural production was penalized by much higher levels of tariff protection for manufacturing, which were amplified by nontariff barriers such as “red-tape” costs of importing and a restrictive system of standards and quality controls (Nathan Associates 1996, 1998).

In the past decade, tariff and trade reform appears to have had little impact on the extent of tariff escalation between primary agriculture and processed food, and the tariff decline for primary agriculture—from 4.6 percent in 1995 to 1.9 percent in 2005—has widened the gap between it and tariff protection for nonagricultural primary sectors, which has remained steady at over 10 percent on average (UNCTAD-TRAINS 2006).

The exchange rate appeared to be overvalued in the 1960s and 1970s, since it was well below the black market rate, but devaluations in the late 1970s, the late 1980s, and the early 2000s have periodically corrected its misalignment (Cassing, et al. 2007, appendix figure 3). The inflation rate has varied, exceeding 10–15 percent for much of the 1970s and 1980s before falling substantially in the 1990s.

Policy Evolution

Economic performance is tied to events and to policy. From 1950 to 1952, the annual rate of GDP growth in Egypt was 7–8 percent (Al-Sayyid 2003). After the 1952 revolution, however, the growth rate declined sharply before beginning a slow recovery in 1955–56 (Mabro 1974). This was also a period of political instability and, despite some effort to attract foreign capital, low foreign investment. Income and wealth were highly skewed: 1 percent of the farm population received 39 percent of total agricultural income, while only 29 percent of the total farm income went to landless and poor peasants who accounted for 80 percent of the farm population (Abdel-Fadil 1975, 1981). In the urban areas, the poorest 60 percent of the population received 18 percent of total personal income, while the top 1 percent received 11 percent.

From 1956 until about 1966, the economy was marked by a rapid swing toward state socialism. While the Organization of Free Officers that took power in 1953 had no strong, unanimously held views on economic policy other than to support “social justice” and land reform, the genesis of the policy shift resided in the political events that shifted Egypt’s trade orientation from West to East (Nutting 1972; Hansen and Nashashibi 1975).² The public sector expanded, and with a large number of public enterprises it increasingly dominated the economy. A period of agrarian reform reduced the maximum landholding to 100 acres per family and saw the beginning of state planning and procurement policies for most major crops. GDP growth was fairly high in this period, about 8–12 percent a year (Al-Sayyid 2003), but central planning was beginning to show strains.

The period between 1967 and 1973 began and ended with wars. Economic growth slowed to 3.1 percent following Egypt’s defeat in the June War of 1967. Emphasis was put on industrialization, and the maximum farm landholding was lowered in 1969 to 50 acres per family. From 1975 until the early 1980s, the Egyptian economy grew at about 6 percent per year. But much of this performance was attributable to one-time factors such as the return of oil fields after the 1973 war, the rise in oil prices in 1973 and 1979, increased use of the Suez Canal, inflows of remittances from expatriate workers, and the rapid infusion of external assistance. Savings were low, non-oil manufactured exports were almost nonexistent, public firms dominated the industrial sector, and low investment resulted in crumbling infrastructure (Ikram 2006).

A sharp fall in oil prices in 1982 made the weaknesses apparent, and by 1991 the situation was untenable: the budget deficit was 20 percent of GDP, inflation was almost 15 percent and rising, real interest rates were negative, and external debt was rising as foreign exchange reserves dwindled. At this point, the Egyptian government began to develop a fairly sound macroeconomic environment, and by 1998 inflation had fallen to 3.8 percent, real interest rates were positive, external reserves were much higher, and external debt was manageable.

In addition, the government began to institute significant structural reforms, beginning with the privatization of some public firms, a trend that accelerated after 1996. The financial sector was liberalized a little, with passage of a law that allowed private firm ownership. Some trade reforms were also implemented, although tariff and nontariff barriers remained relatively high and tariff escalation increased. Some attention also was paid to widespread human resource development needs in the hopes of alleviating poverty. The results of the reforms have been mixed but, from a historical perspective, substantial progress has been made toward developing a market-oriented, outward-looking economy.

From the early 1960s until the mid-1980s, agriculture’s share of GDP and employment declined significantly, but because absolute employment and

population numbers in rural areas remained high, the proportions were still 34 percent and 50 percent, respectively. The relative stagnation of the sector was attributable mainly to government intervention in agricultural production, marketing, and pricing (Siam 2005). Administered prices were far below border prices, representing a heavy tax on the sector, as the central government sought to transfer the agricultural surplus to finance the development of the nonagricultural sectors. Confronted with low profitability in agriculture, land productivity declined and labor began to migrate out of agriculture to nonagricultural job opportunities both in Egypt and in Iraq, the Gulf countries, Libya, and elsewhere.

These interventionist farm policies began to be reversed in 1986, when the government took action to transform the economy gradually by reducing its role and increasing the role of the private sector, with the objective of increasing the efficiency of the use of agricultural resources in particular and economic resources generally. More efficient use of agricultural resources was achieved through two stages. The first period (1986–90) focused on direct distortions in agriculture. The prices of 10 main crops were completely or partially liberalized, obligatory deliveries of the strategic crops were reduced or eliminated, subsidies on farm inputs were cut, the government monopoly on major farm inputs and strategic crops was eliminated, and the market for private investment was expanded.

The second stage (1990–97) addressed indirect distortions affecting agriculture by implementing the general macroeconomic reforms discussed above, including an exchange rate determined by the free market and some liberalization of foreign trade.

All of these actions affected agricultural output and trade. Historically, cotton lint dominated Egyptian exports, representing nearly 80 percent of all commodity exports in the early 1960s. Rice has been the other significant agricultural export. However, both items have fallen in importance relative to total commodity exports—now dominated by oil and gas—and relative to other agricultural exports, notably horticulture (Cassing, et al. 2007, appendix figure 2a).

Agricultural imports also were affected. Together, imports of maize, sugar, and especially wheat have represented nearly half of all commodity imports throughout the study period. Maize has grown in importance, reflecting the expansion of domestic livestock industries. Wheat and flour remain substantial imports despite considerable recent policy efforts to encourage domestic wheat production and a publicly articulated, if somewhat unrealistic, goal of wheat self-sufficiency.

These imports are in turn integrally related to the long-standing and politically sensitive policy of substantial bread (*baladi*) subsidies to all consumers. Throughout most of the study period, bread has been sold on the street at 20–30 percent of its border price. Since a government procurement subsidy accounts for the difference, and since bread is a staple in the Egyptian diet with consumption of

almost half a kilo per capita per day, the food policy has become a significant drain on government revenues representing nearly 2 percent of GDP annually. Some sugar and cooking oil is also substantially subsidized in consumption, but these commodities are subject to rationing.

Measures of Distortions to Agricultural Incentives, 1955–2005

Using the methodology for this project, explained in appendix A and Anderson et al. (2008), we quantify the extent of direct and indirect distortions affecting the agricultural sector in Egypt. The main focus is on government-imposed distortions that create a gap between domestic prices as they are and what they would be under free market conditions. Since the characteristics of agricultural development cannot be understood with a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in nonagricultural sectors for comparative evaluation.

More specifically, this study computes a nominal rate of assistance (NRA) for farmers that includes an adjustment for direct interventions on inputs. It also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables, through the calculation of a relative rate of assistance (RRA; see appendix A).

The analysis considers five import-competing products (maize, sugar, wheat, meat, and milk) and two exported crops (cotton and rice). These products constitute around 70 percent of primary agricultural output. For sugar, rice, and cotton, we also report on the primary commodity (cane sugar, paddy rice, and seed cotton) as well as on the lightly processed derivatives. We have not focused specifically on berseem, which is an important feed input for livestock but is rarely traded, nor on horticulture, which consists of essentially undistorted commodities.

Nominal rates of assistance and consumer tax equivalents

As noted, the NRA measures can include policy-induced input price changes. While some inputs have been subsidized in Egypt—notably, water, fertilizer, and pest control—we have mostly ignored this channel of assistance. Thus our NRA estimates are mostly NRAs on output.

Table 2.1 summarizes the NRA for all seven commodities, while figure 2.2 shows the NRA by trade status. Trends were roughly similar for all of the commodities. In particular, all of the crops were penalized substantially in the early part of the study period, but those penalties were reversed in the mid-1980s. This

Table 2.1. NRAs and CTEs for Covered Farm Products, Egypt, 1955–2005*(percent)*

Product	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–05
NRA, exportables ^a	-31.5	-52.4	-62.4	-62.2	-43.4	-34.0	5.0	-30.9	-17.8	-28.1
Rice	-64.4	-62.4	-57.4	-48.5	-22.6	-19.6	52.4	-11.9	-18.2	-23.8
Cotton	-21.6	-50.0	-64.0	-64.9	-49.9	-38.7	-13.6	-40.2	-14.5	-34.1
NRA, import-competing products ^a	-34.3	-44.0	-44.6	-44.4	-5.5	-2.5	138.2	2.4	16.9	0.0
Wheat	-40.8	-48.5	-34.2	-30.0	-12.7	-31.5	129.2	47.5	29.6	6.0
Maize	-32.1	-35.5	-31.8	-22.4	23.6	13.2	237.4	31.1	23.1	17.8
Sugar	-26.9	-52.8	-34.7	-59.3	-26.6	-8.9	81.6	-24.4	-5.4	7.2
Meat	-13.4	-32.6	-49.9	-48.0	12.3	26.5	156.2	-11.2	34.5	1.6
Milk	-68.1	-57.1	-50.6	-43.1	-28.8	-43.9	57.4	-15.6	-19.5	-19.3
NRA, total of covered products ^a	-33.1	-48.1	-53.6	-53.0	-23.2	-13.3	87.3	-9.1	5.9	-8.3
Dispersion of covered product NRAs ^b	21.9	14.7	17.1	21.3	32.2	31.9	89.6	33.0	28.7	23.0
Percent coverage (at undistorted prices)	70	71	70	71	69	68	65	67	67	67
CTE, total of covered products ^c	—	-51	-49	-50	-21	-13	108	-3	13	-2
of which wheat flour	-76	-79	-73	-72	-65	-72	-4	-36	-44	-56

Source: Data compiled by the authors.

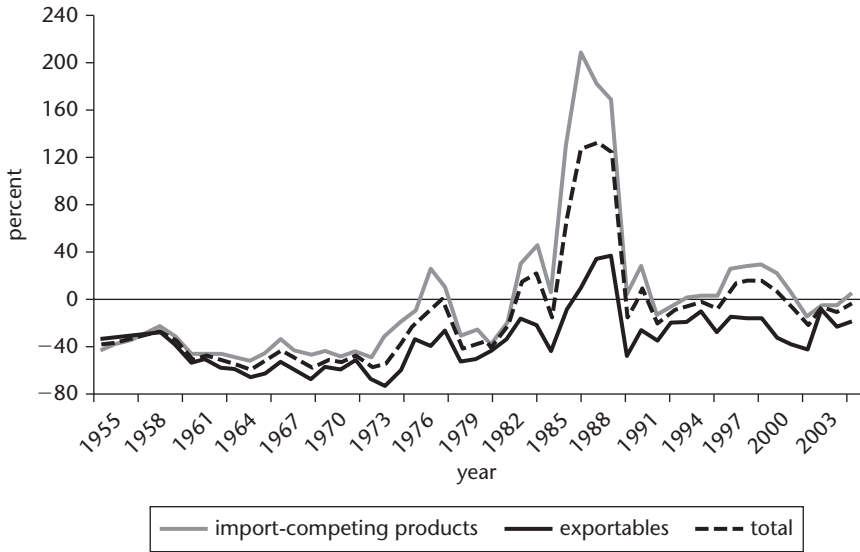
Note: — = data are not available.

a. Weighted averages, with weights based on the unassisted value of production.

b. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

c. Weighted averages, with weights based on the unassisted value of consumption.

Figure 2.2. NRAs for Exportable, Import-Competing, and All Agricultural Products, Egypt, 1955–2005



Source: Data compiled by the authors.

is consistent with the earlier study by Dethier (1991), who recorded negative rates of direct and exchange rate assistance on the order of -30 percent to -40 percent for wheat and maize from 1964 to 1985, and -60 percent or more for rice and cotton. Dethier reports only modestly negative or no assistance for sugarcane when the calculation is relevant using his methodology.

The NRAs turned positive by about 1986 and then suddenly spiked over the next couple of years. This reflected not only the government's attempt to reinvigorate agriculture but also an overshooting, because administered prices were adjusted substantially upward and tied to a lagging moving average just as world prices fell dramatically in 1986. Indeed, 1986 was the last year of area restrictions, quotas, and low fixed procurement prices for wheat and maize. Private sector imports were allowed in 1991–92. Cotton procurement prices were gradually increased from 1986 to 1991 to more closely reflect border prices and were deregulated after that. Furthermore, the exchange rate regime was liberalized substantially in this period, and the black market premium disappeared as rates were market determined.

Rice and sugar exhibit similar trends, including the spike in the 1985–89 period, although neither product was deregulated until later. Sugar production was never fully deregulated and remains a government enterprise at the milling level, while rice was not really liberalized until 1991.

Table 2.1 also reports NRAs for milk and beef, neither of which is much traded although we still categorize them as importable. Livestock was largely unregulated, but beef production was protected with a 100 percent import tariff; in addition, very restrictive health standards applied to beef imports for some years. Our calculations suggest that milk and beef products followed the NRA patterns of the five crops, although beef in particular seems to have experienced few disincentives in the 1970s and 1980s as livestock expanded fairly steadily until feed—maize and berseem—became an input constraint. Note that while the mean NRA has approached zero, the standard deviation of NRAs has increased over time (near the bottom of table 2.1). Consequently the welfare cost of agricultural programs may have remained high, and possibly even have risen, because of the intrasectoral variance in covered NRAs.

Since it is mostly trade measures that generate the NRAs, the distortions of the consumer side of the market are similar. This can be seen from the estimates of the average consumer tax equivalent (CTE) across covered products, shown at the bottom of table 2.1. Wheat flour receives a very heavy consumer subsidy, with its price being as low as one-fifth the border price in the 1960s (final row of table 2.1).

We assume noncovered farm products face no distortions to their prices, because they are mostly horticultural products that are not subjected to government policy interventions. Including them therefore reduces the overall average NRA for the agricultural sector, as shown in the top rows of table 2.2. We have no estimates of assistance that is not product specific.

Relative rate of assistance

The relative rate of assistance (RRA) seeks to take into account the effects on farmer incentives of policy-induced price changes in nonagricultural sectors. It does so by comparing the NRAs for only the tradable parts of agricultural and nonagricultural sectors. The NRA for the nonagricultural sector is assumed to be the average import tariff equivalent throughout the period (so ignoring nontariff barriers for which we have no estimated NRAs). All manufactures are assumed to be import competing, and “other primary exports” are assumed to represent nonfarm exportables. For early missing data years, we simply assume that nothing had changed from the closest available year, which was 1960. These calculations suggest that nominal nonagricultural (weighted) assistance averaged in the 30–45 percent range up to the mid-1970s and then remained close to 25 percent except for a couple of outlier years. Consequently, since the nonagricultural sector was favored by import protection and an overvalued exchange rate over the study period, the RRA estimates were considerably below the NRA estimates for agricultural tradables (table 2.2). And they were positive only in the latter 1980s (figure 2.3). For the latest period, 2000–05, the estimates suggest that producer

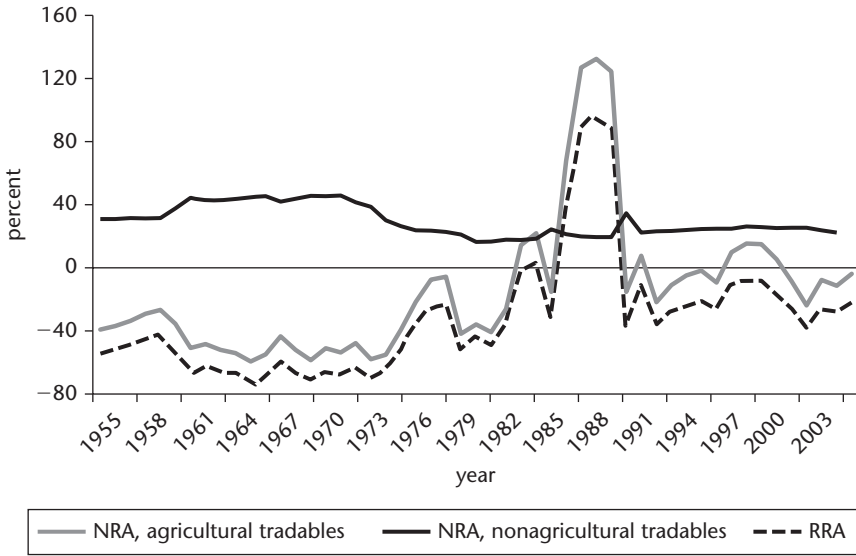
Table 2.2. NRAs in Agriculture Relative to Nonagricultural Industries, Egypt, 1955–2005*(percent)*

Category	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–05
NRA, covered products	-33.1	-48.1	-53.6	-53.0	-23.2	-13.3	87.3	-9.1	5.9	-8.3
NRA, noncovered products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NRA, all agricultural products	-23.2	-33.9	-37.7	-37.5	-15.9	-9.2	56.6	-6.1	4.0	-5.5
Trade bias index ^a	0.05	-0.15	-0.32	-0.31	-0.39	-0.28	-0.55	-0.32	-0.29	-0.27
NRA, all agricultural tradables	-33.1	-48.1	-53.6	-53.0	-23.2	-13.3	87.3	-9.1	5.9	-8.3
NRA, all nonagricultural tradables	31.2	42.3	44.2	40.3	23.5	17.4	20.9	25.5	25.2	24.1
RRA ^b	-49.0	-63.4	-67.8	-66.5	-37.8	-26.3	55.6	-27.3	-15.5	-26.1
Memo item, ignoring exchange rate distortions:										
NRA, all agricultural products	-21.7	-29.2	-32.3	-34.4	-15.7	-9.1	57.1	-5.3	4.0	-5.5
RRA ^a	-45.8	-53.9	-57.5	-59.5	-37.4	-26.2	55.9	-24.9	-15.3	-26.1

Source: Data compiled by the authors.

a. The trade bias index = $(1 + NRA_{ag,x}/100)/(1 + NRA_{ag,m}/100) - 1$, where $NRA_{ag,m}$ and $NRA_{ag,x}$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

b. The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 2.3. NRAs for Nonagricultural and Agricultural Tradables and the RRA, Egypt, 1955–2005

Source: Data compiled by the authors.

Note: For definition of the RRA, see table 2.2.

prices for farmers relative to prices received by producers of nonagricultural tradables were about one-quarter below what they would have been under free market conditions. The bottom two rows of table 2.2 show what those indicators would be if the exchange rate distortions had not been included in our analysis. In that case both the NRA for the agricultural sector and the RRA would have been slightly less negative before the 1980s.

While agriculture was repressed until about the mid-1980s, the degree of negative bias appears to have lightened or even reversed since then. Typically, import-competing industries fared better than exportables. This picture is consistent with studies by Fletcher (1996), Bautista et al. (1998), and Ender and Holtzman (2003), who find that any biases against primary agriculture that existed earlier seem to have largely disappeared after the mid-1980s. The similarities in the NRA and RRA calculations suggest that the trends owe more to reversal of low procurement prices and exchange rate misalignment than to the import-substitution policies favoring nonprimary agriculture and manufacturing.

In calculating the experience of each product, we have assumed that one-half of foreign exchange was converted at the parallel rate when the official rate seemed overvalued. This assumption is consistent with Al-Sayyid (2003), who reports a flourishing gray market during the period of the 1960s and 1970s when

the exchange rate premiums were most pronounced. We use the black market premiums as reported in Cowitt (various years) to calculate the parallel exchange rates. The impact those exchange rate distortions have on the NRA and RRA estimates is relatively minor except in the 1960s, as shown at the bottom of table 2.2.

Evolution of Specific Policy Choices and Their Impacts

In this section, we focus on the policy choices of the Egyptian government, especially with respect to agriculture and food policy, but we are mindful that certain industrial and exchange rate policies had profound indirect effects on agriculture. The main indirect policy effects were engendered by trade protection and direct subsidies to nonagricultural industries, especially heavier manufacturing industries, and by an overvalued exchange rate. By the 1990s, high and escalating tariffs along with some nontariff barriers (such as “standards”) for manufacturing were the main remaining indirect disincentives to agriculture.

As recounted earlier, widespread planning characterized much of the economy from about 1956 until the mid-1980s, but the retreat from markets was operationally less pronounced in agriculture until the 1960s. By 1964, however, central planning, mandatory membership in agricultural cooperatives, and administered prices for major crops were in place. Consequently, we briefly review developments during a period of regulation, 1964–1986, which are surveyed extensively in Dethier (1991), and the subsequent period of deregulation, 1987–2005, characterized by a turn back toward market incentives. We begin with an overview and then turn to some product-specific issues, food subsidies, and rural income. We relate our narrative to the measures of distortions presented in tables 2.1 and 2.2 and figures 2.2 and 2.3.

Overview: 1964–1986

This period was characterized by “Arab socialism” and a widespread distrust of markets, rooted in the 1952 revolution and Suez Crisis of 1956. The policy objectives of the period were aimed at promoting the equitable distribution of food and income in Egypt and financing industrial growth through the provision of inexpensive food to urban consumers. The context was a vision of a grand coalition between the factory worker and the rural peasantry.

To achieve these objectives, the government mandated crop rotation schedules and crop area allocations, a compulsory delivery quota for crops at fixed prices that were substantially lower than international prices, and subsidized consumer prices for basic food commodities. As reported below, while administered prices and quantity quotas (acres) need not necessarily be inconsistent with one another, in this case they were.

Institutionally, agricultural cooperatives were created in each village to control production and marketing of major crops. Cooperatives, in turn, provided agricultural inputs to farmers, imposed crop rotation schedules, procured the crop quotas, and ultimately marketed the major crops. The Principal Bank for Development and Agricultural Credit was reconstituted to work with the cooperatives in providing credit to farmers and receiving their output quotas.

In effect, and mixed with substantial planning in the nonagricultural sector along with an overvalued exchange rate aimed at conserving foreign exchange resources, the policy performed poorly. The government intervention in production and marketing created many inefficiencies and distorted choices among competing crops.³ The overvalued exchange rate and artificially low producer prices eventually suppressed agricultural production and led to stagnation of the agricultural sector. The extent of the disincentives to agriculture is clear in table 2.1: for the five crops studied and milk, the NRA is almost uniformly and substantially negative throughout the period. Beef and maize appear to have been mildly favored toward the end of this era.

These disincentives to farm production ultimately frustrated the original policy objectives. Yields fell, cropping patterns were distorted, and cotton exports declined. The food gap, which had narrowed somewhat initially, widened by the mid-1980s, and self-sufficiency in wheat declined to its lowest level as imports rose. The food subsidy system imposed a heavy burden on the government's budget and foreign exchange reserves, thus frustrating plans to support industrialization and conserve foreign currency. Furthermore, instead of achieving "a more equitable distribution of income," the urban-rural income gap initially grew as the heavy implicit taxation reflected in artificially low producer prices caused farm incomes to decline. That decline increased the political hostility of the rural classes toward the government, which responded not by reducing government intervention but by increasing subsidies to farm inputs and extending food subsidies to rural areas in the late 1970s (Dethier 1991). In addition, land reform laws arguably redistributed land ownership more equitably.

Overview: 1987–2005

Except for seeking to redress the budgetary and foreign exchange pressures its initial policies created, the government's overall policy objectives after 1986 remained ostensibly unchanged. Specifically, the agricultural reform program of this era aimed to provide an adequate supply of food to all income groups, to promote greater self-sufficiency in crop production, to increase farm income, to conserve foreign exchange, and to bring the budget deficit under control (Kherallah 2000).

In fact, the policy pursued was essentially one of dismantling central planning and restoring market incentives. The policy measures implemented under the agricultural reform program consisted of two phases. In the first phase, prices, quotas, some crop restrictions, and marketing controls were partially liberalized for 10 crops. The compulsory delivery program was eliminated for all crops and replaced with an optional program for 3 of them, namely, wheat, maize, and rice. Moreover, procurement prices were replaced by floor prices, often tied to a moving average of lagging prices. It is this last feature that accounts for the positive NRA spikes in 1986–87, shown in figure 2.2, when generous floor prices were set just as world prices were falling. The volatility in the NRA caused by anchoring domestic prices to an average of lagging prices is consistent with the finding by Baffes and Gardner (2003) that world price fluctuations over time were transmitted only incompletely to domestic markets in Egypt.⁴

The second phase of the reform coincided with the launching of the Economic Reform and Structural Adjustment Program in 1991. With the assistance of the International Monetary Fund (IMF) and the World Bank, this program sought to shift Egypt from a state-controlled economy toward a more efficient, market-oriented economy. In this phase, cotton marketing was liberalized, all remaining input subsidies were eliminated, and the private sector was encouraged to play a greater role in agricultural trading. By 1997, the land rental relationship was liberalized as well.

Our measures of the NRA and RRA indicate that these policy shifts had an impact, appearing to reduce or eliminate the direct disincentives to agriculture (although, as noted earlier, the increased variance of the NRA has made the welfare implications of the policy shift less clear). Protection for nonagricultural industry and processed foods remains but is not large when weighted by production. Agricultural yields have generally increased and cropping patterns have been rationalized (Saad et al. 1996; Ender and Holtzman 2003). On the other hand, although farmgate prices have risen, the enactment of a market-oriented land policy has left landless some tenants who previously benefited from controlled, artificially low, land values.

Crop-specific and other farm policies

Because the measures adopted by the government vary by product, we consider them in turn.

Cotton

For more than a century, cotton has been an important traditional crop in Egypt, dominating area planted, value of production, importance to downstream industry,

and exports. The sector was nationalized in the 1960s, and low administered procurement prices, along with many other interventions, were used to divert revenues to the government. This policy is clearly reflected in the large negative NRA estimates for cotton (see table 2.1), particularly before 1987, although the cotton sector was again taxed heavily in the early 1990s (Saad et al. 1996).

In consequence, total area planted in cotton declined by about half from 1980 to 2000. This contraction resulted from low profitability and was exacerbated by rising wages in the 1970s and 1980s (cotton is one of the most labor intensive of the major crops).⁵ The land was instead planted with cereals, especially wheat and rice, a fact consistent with our NRA estimates for wheat and rice, which turned from substantially negative to mildly positive after the mid-1980s (see table 2.1). Horticulture also expanded somewhat, and berseem became quite profitable as the livestock sector flourished (see figure 2.1).

Confronted with the demise of a profitable industry, the government reversed course in the 1990s. In 1992, procurement prices were increased to 66 percent of a five-year moving average of world prices. This policy accounts for both the upward trend and the sharp swings in our NRA estimates after 1991 as world prices fluctuated yearly. In 1994, administered prices were changed to floor prices, although the government did limit exports in 1995 to satisfy the needs of local mills, and in 1996, the floor prices actually exceeded the border prices.

In 1997, prices became market determined and the sector was essentially completely liberalized. Nonetheless, the NRA for cotton remained negative and, until quite recently, substantially so. The negative NRA reflects domestic prices, which, although rising, still lagged border prices as the Egyptian pound depreciated sharply against the U.S. dollar, falling from 2.16 in 1991 to 3.41 in 1997 and to 6.15 in 2004. Apparently the exchange rate changes are reflected more slowly in prices closer to the farm, or possibly they are captured somewhere in shipping and processing along the value chain between farm and port.

Rice

Rice is Egypt's other export crop. Since the 1960s, the government has intervened actively in the rice supply chain with low administered prices, government procurement, an export monopoly, and extensive public sector mills. In the 1960s and 1970s, both processed rice and primary production confronted disincentives, but paddy rice was penalized even more, which allowed the mills, and traders, to garner profits somewhat at the expense of the farmer. Our calculations show that this relative disadvantage disappeared in the 1980s. In any case, the relative price advantage of rice over cotton, which was still penalized, aided perhaps by the relatively higher subsidy value of the free water policy to a water-intensive crop, resulted in continued expansion of rice acreage as cotton contracted. Rice

expansion was further encouraged by incentives to wheat—the two crops are complementary in the crop rotation.

In the 1990s, rice production was substantially liberalized, and crop area, yield, and production grew by 4–5 percent. Nominal prices to farmers doubled, and assistance to paddy rice was actually positive or only mildly negative. Farmgate prices for rice rose so much at one point that milling and exporting became unprofitable and the government enacted export subsidies of 100–200 Egyptian pounds (LE) per ton to aid the (mostly government-owned) milling sector. As with cotton, the negative NRAs since the early 1990s reflect rising domestic prices that nonetheless lag behind border prices, which were rising rapidly in domestic currency terms because of the sharp currency depreciation.

A number of commentators have noted that government rice policy is often in conflict with itself. Crop choice has been liberalized, yet the rice growing area is still restricted. Similarly, while the area is restricted to conserve on water usage, exports are periodically subsidized.

Maize

Maize, an import-competing industry, competes for growing area with rice and cotton, as well as with some other summer crops. Since the 1960s, maize has been regulated through mandatory cropping, delivery quotas, and administered prices. This control resulted in very negative NRAs throughout the 1960s and much of the 1970s. Low prices for yellow maize were passed on as feed subsidies until 1987, when the sector was liberalized and procurement prices were raised to encourage production, consistent with the government's renewed interest in food self-sufficiency and the growth of the livestock industry.⁶ The production area has expanded largely by displacing cotton; in the current decade maize accounts for about 15 percent of the cropping area.

Politically, maize policy has become more entwined with food policy. Foremost, yellow maize is an important input into the expanding livestock sector, which in turn is stimulated by the growing Egyptian demand for red meat. Also, in an effort to reduce wheat imports, which have risen to produce subsidized *baladi* bread, the government has experimented with substituting maize flour for wheat flour. Because maize flour is cheaper, the cost of producing bread is thereby reduced and, along with it, the government cost of the bread subsidy.

Sugar

Sugar processing is directed by a government-owned company, the Egyptian Sugar and Refining Company. Prices are administered, and procurement is handled through contracts between producers and the government company. Sugar consumption, which for a long time has been a part of the food subsidy policy, is

still partially subsidized through price-discounted ration cards distributed to nearly two-thirds of the population. Because of the consumer subsidies, providing higher prices to growers has a negative impact on the government budget. Moreover, inefficiencies in milling, which inflate processing costs, make it difficult for the government to raise the farmgate prices of sugarcane and sugar beet (the latter of which represents about one-quarter of sugar production). Nonetheless, we calculate that after the late 1970s, the NRA for sugar turned positive, corroborating the estimates in Dethier (1991).

Wheat

Wheat is the primary input into the most important staple food in Egypt, bread, which is consumed in enormous quantities, heavily subsidized, and at the heart of a politically charged food subsidy policy. Before 1955, the government slowly began to tighten its control over the production and trading of wheat. The explicit objective was equitable distribution of food and income, and the provision of inexpensive food for urban consumers aimed to finance industrial growth (Kherallah et al. 2004). In 1955, the government reduced the area allocation requirement for wheat production to 33 percent of agricultural land holdings and at the same time initiated a compulsory delivery policy whereby each farmer had to sell a specific quota of wheat—between 1 and 3 *ardeb* per *feddan*—at a fixed price that was lower than the international price. By the 1960s, wheat, along with the other cereals, was subjected to mandatory delivery quotas, low administered prices, and other marketing regulations. As table 2.1 shows, the NRA for wheat was substantially negative until about 1987, although it increased in the late 1970s, reflecting the replacement of the compulsory delivery requirement with an optional delivery program in 1976.⁷ In 1960, Egypt began to import wheat for the first time in its history and has imported it ever since. Before 1965, imports were further encouraged by U.S. PL-480, which made available credit subsidies for wheat imports from the United States.

After 1987, the government offered floor prices, announced at planting time and set to approximate or exceed international prices. For example, in 2005, the procurement price for wheat from Egyptian farmers, at LE 1,165 per ton, was about 11 percent higher than the price of French wheat adjusted for shipping costs. Since the government procured 2 million tons locally at this price, support payments amounted to about LE 220 million, or about 3 percent of the total value of wheat production. As with the other cereals, there was some overshooting in the late 1980s when floor prices exceeded international prices, but the NRA generally turned neutral or positive after that. Wheat production expanded and yields rose as well. Nonetheless, since the early 1980s, Egypt has never produced more than 55 percent of its total wheat consumption, making it one of the top four wheat importers in the world.

Livestock

Egypt has a significant stock of animals yielding meat and milk. (Buffalo are also a source of power on the farm.) Since there is little permanent pastureland, animals feed on berseem, corn, barley, and wheat, and thus compete with human consumption. The livestock population grew steadily after 1952, stimulated by an NRA of 100 percent and rising demand, and stabilized during the 1980s as feed became less available. Milk from water buffalo is consumed primarily on farms, while milk consumed in urban areas is supplied by commercial dairy herds of mainly Holstein cattle. In addition to buffalo and cattle, farmers raise poultry, sheep, and, in diminishing quantities, camels. Pigs are less important because pork is not widely consumed for religious reasons.

Input policies

Before the reform era of the mid-1980s, the government, through the Principal Bank for Development and Agricultural Credit monopolized farm inputs and distributed, at subsidized prices, many inputs from seed to fertilizer administratively, using technical information from the Ministry of Agriculture and Land Reclamation to ration inputs. The subsidies fell mainly on chemical fertilizers, pesticides, seeds, and animal feed. Under the Economic Reform and Structural Adjustment Program, the monopoly was eliminated and private investment was allowed to compete with the Principal Bank for Development and Agricultural Credit, although there was a two-year reversion to the old system for fertilizer during the 1995 “fertilizer crisis.” Today, private firms dominate the fertilizer industry, accounting for 75 percent of nitrogen fertilizer and for all phosphorus chemical fertilizer (Saad 2003). The private sector was also allowed to import, export, and distribute farm inputs. The government still controls cotton pesticides, however. Between 1990 and 1997, virtually all input subsidies were eliminated and input prices now approximate international prices. Import taxes on fertilizer, prominent in the 1970s to protect some domestic producers, do not exceed 2 percent now.⁸

The Nile River almost defines Egypt, and water policy is viewed as critical. Many elements of Egypt’s water policy are centuries old, did not change over the study period, and are commonly viewed as the purview of government. These include minimizing water loss (modern irrigation methods, improved navigational paths, new approaches to canal maintenance and weed control, efficient use of groundwater, water recovery, and the like) and various programs for cost sharing (currently through water users’ associations, which are locally based). In addition, the Aswan High Dam came on line during the study period. In effect, the marginal cost of water to farmers is zero. This situation has resulted in the expansion of water-intensive crops—rice, bananas, and sugar cane—relative to what otherwise might have been. This water subsidy might help explain how rice can

remain a viable farm industry despite the negative NRA estimate shown in table 2.1. Note, however, that any water subsidy encourages farmers to choose rice over cotton (Hansen and Nashashibi 1975).

Land policy has evolved from an initially highly political issue that is integrally related to rural incomes. In 1952 the government announced that land reform would be a centerpiece of rural income equity policy. Over the ensuing years, land ownership was limited to 50 *feddans* (about 48 acres), and about 12 percent of the cultivated area was distributed to 341,000 families who had previously been tenants. Over the years the number of small-holders owning 5 *feddans* or fewer has increased substantially, suggesting continued land fragmentation. By the end of the 1990s, the average size of a holding was less than 2 *feddans*. In 1990, about two-thirds of the total land area was owned and cultivated by landlords (with family or hired workers) and only about 10 percent was rented for cash or share-cropped (Siam 2005).

Food consumer policy

It is impossible to divorce agricultural reform in Egypt from food policy, or food policy from real incomes. Historically food consumer subsidies and food security have been pursued in Egypt for more than 10 centuries, and state granaries have existed since Pharaonic times (Scobie 1981a, 1981b). There is a very deeply ingrained mindset in the general population that government is mandated to ensure affordable food and, since the Nasser era, the state has explicitly pursued that mandate (Khouri-Dager 1996). Indeed, Singerman (1995) argues that the government policy of political exclusion has paralleled its commitment to provide the basic needs of the population, thereby maintaining its legitimacy. Thus, food consumer subsidies, especially for *baladi* bread and flour, are viewed as central to political stability, and the food riots of 1977, triggered by increases in the prices of staples, still serve as a reminder for caution in policy reform. However, as the government recognizes, a policy aimed to subsidize food consumption and raise farmgate prices to encourage production and reduce imports, while still maintaining a credible budget balance to pursue other development goals, is inherently inconsistent.

Specifically, while rationing and subsidies for sugar, edible oil, sometimes wheat, and some other products were in place before 1952, the government expanded the program greatly after the revolution—and especially in the 1960s and 1970s—extending it to 18 foods, including beans, lentils, frozen fish, red meat, chicken, rice, and yellow maize. There was some rationing, but *baladi* bread in particular was not rationed and was heavily subsidized to the general public through the mechanism of subsidizing the wheat input to the bakeries. As self-sufficiency in wheat became elusive, and after 1960 as imports grew, this subsidy, along with the others, became a substantial drain on the budget.

After the 1976 attempt to cut subsidies met with violent public resistance, a more gradual approach was invoked. The number of subsidized foods was reduced, subsidy levels were decreased, and distribution of ration cards became stricter. Currently, sugar, edible oil, and *baladi* bread and flour continue to be subsidized. Sugar and oil are rationed and arguably manageable. Bread, however, is still not rationed, and it has been estimated that as much as 8 percent of the total available is used as livestock or poultry feed.

Since the 1980s, the subsidy benefits have been about equally distributed across the population. In this sense the food subsidy is not well targeted even though it may be perceived as one of the most effective means of alleviating poverty in Egypt. The bread subsidy has been cited as particularly effective in rural areas where it has helped 11 percent of the poor out of poverty; bread is a basic source of nutrition for this group, accounting for 27 percent of the rural poor's total caloric needs.⁹ Nonetheless, the system remains blunt in its targeting and expensive to operate. Leakages from the system into the black market are significant—28 percent for flour, 20 percent for sugar, and 15 percent for cooking oil—and the costs of transferring LE 1 of income to the needy often costs the government more than three times that amount (Ahmed et al. 2001).

Bread policy presents a political economy dilemma for the Egyptian government. Currently, for example, the government provides 6 million tons of wheat for bread made available on the street at 5 piastres a loaf, which is just 30 percent of the true cost of the wheat input. One-third of the wheat is procured from local production by the Ministry of Supply and Home Trade, and the rest is imported by the General Authority for Supply Commodities. Given the recent depreciation of the pound, the purchase of imported wheat at international prices, along with price supports, generates a subsidy cost on the order of LE 9 billion a year, or almost 2 percent of GDP.

The cost of the other food subsidies is less severe. Access to subsidized sugar and edible oil is rationed monthly, at 0.5 kilogram and 1 kilogram, respectively. While some receive a full subsidy (green cards), others receive only a partial subsidy (red cards) or no subsidy at all. The coverage of ration cards has been reduced modestly from 79 percent of the population in 1994 to 63 percent in 2004, when about 40 million individuals were covered by the green cards and about 6 million by the red cards. Table 2.3 reports on total food subsidies in recent years, where the dominance of the bread subsidy is clear.

Impact on Rural Incomes

The agricultural reforms undertaken in Egypt over the last two decades have been broad and deep. Essentially, the agricultural sector has been converted from an almost totally centrally planned economy to a fairly wide-open free market

Table 2.3. Costs of Consumer Food Subsidies, Egypt, 1990–2005
(LE millions)

Fiscal year	Sugar	Oil	Baladi bread	Total
1990/91	500	368	1,255	2,123
1991/92	675	586	1,057	2,318
1992/93	597	500	1,308	2,405
1993/94	464	471	1,424	2,359
1994/95	464	473	1,486	2,423
1995/96	466	479	2,185	3,130
1996/97	635	520	2,307	3,462
1997/98	511	497	2,380	3,388
1998/99	530	400	2,460	3,390
1999/2000	449	657	2,561	3,667
2000/01	523	798	2,744	6,465
2001/02	577	719	2,950	4,246
2002/03	546	614	3,009	4,169
2003/04	609	854	3,201	4,664
2004/05	634	1,283	7,123	8,051
2005/06	609	1,570	8,442	10,622

Source: Ministry of Supply and Home Trade.

economy. Because the earlier administration model entailed using agriculture as a source of forced savings to subsidize the urban consumer and industrialization, this reform should have resulted in increased rural prosperity as farmgate prices were allowed to rise.

However, the link between rural incomes and reform is not straightforward. Rural income is generated from owner-worked farms, hired labor, tenant farmers, and nonfarm wages. Currently in rural Egypt, wage employment makes up the largest part of household income, about 43 percent, and explicit agricultural income constitutes about 29 percent. Of the remainder, transfers are the most important, at 17 percent. The value added in primary agriculture depends both on output prices for primary goods and on input prices, especially prices for land, water, fertilizer, and pest control. The cost of food is also a very large component of real income.

Rady, Omran, and Sands (1996) calculate that the agricultural resource income available to labor and other inputs from eleven crops, including the five crops of focus here, rose by 22 percent in the reform era of 1987–94, compared with the 1980–86 period immediately before reform. While the reduction of input subsidies hurt somewhat (income fell in 1991), the increases in efficiency, higher prices, and improved incentives allowed the same resources to generate over 20 percent more income. Rady, Omran, and Sands observe that “these are precisely the kinds

of gains that justify the political risks that policy decision makers confronted when formulating the reforms.”

The impact of reform on income distribution and poverty is more complicated. A number of studies have attempted to assess the issues using household-expenditure survey data obtained from the country’s Central Agency for Public Mobilization and Statistics and other data assembled by the International Food Policy Research Institute. Food items, especially grains and high-carbohydrate items, dominate household expenditures in both rural and urban areas of Egypt, representing about 50 percent of expenditures on average and 70 percent for the poor. So the impact of more expensive food resulting from either higher farmgate prices or reduced food subsidies is potentially enormous. Datt and Olmstead (1998) infer that real wages declined substantially in response to food price increases and imply that the increases in the prices of food crops in the context of the Economic Reform and Structural Adjustment Program most probably led to a decline in rural real incomes.

Siam (2005) reports a similar finding, noting that a significant increase in the agricultural wage in money terms in the 1990s was not reflected in living standards in the rural sector because the cost of living increased by more than the wage. According to El Helepy (2004), the index of the real agricultural wage (relative to the rural cost of living) fell by about 35 percent between 1974–91 (straddling reform) and 1992–2002. This may be explained substantially by the effect of the structural adjustment program, under which farm prices increased by more than agricultural wages. Moreover, labor wages contribute a significant part of farm incomes, particularly for the majority of small farmers where it is as much as 70 percent. The ratio between the agricultural wage and nonagricultural wage narrowed to 0.18 in 1992–2002, from 0.26 in 1982–1991 and 0.29 in 1974–81 (El-Halaby 2004). This may account for some of the labor migration out of agriculture. Land reform also pushed some poor households out of crop agriculture and into informal wage employment and the livestock-rearing sector.

Comparing 1981/82, before reform, with 1990/91 after reform, IFPRI (1994) concludes that poverty increased slightly in urban areas and may have increased in rural areas, depending on the particular income level used to measure poverty. If all food subsidies were to have been removed in 1990/91, the poor would have required income increases of 17 percent just to maintain the same welfare level. Since poverty is generally higher in some politically sensitive areas of the rural Nile Delta, it is understandable that policy reform has been marked by cautious gradualism. Lofgren and El-Said (1999) estimate that the benefits of eliminating the sugar and edible oil subsidies would be small while the negative impact would be quite regressive. Gutner (1999) has proposed more politically palatable targeted food subsidy reforms that would reduce access of the wealthy.

What about Future Policies?

From 2000 to 2003, real incomes in Egypt stagnated, unemployment rose, and inflation approached 16 percent. In 2004, a proreform cabinet led by Prime Minister Ahmed Nazif was appointed, and reappointed in 2005, with a mandate to bolster private sector activity through policy reforms. Recently, import tariffs and income taxes have been reduced, and plans are in place to privatize most state enterprises and to restructure the financial sector. Feedback is positive as real GDP growth has increased, inflation has fallen, real interest rates are now positive, and investors have reappeared. Moreover, foreign exchange earnings are strong, led by the energy sector, tourism, Suez Canal revenues, and worker remittances.

These recent reforms and the programs announced, particularly the import tariff reductions and commitment to a flexible exchange rate, should work to reduce the remaining indirect disincentives to primary agricultural production. According to our NRA calculations, the remaining direct disincentives in farming are not large after the substantial reforms of the last decade. However, milk and the exportables, cotton and rice, continue to suffer negative assistance. And food subsidies, especially for bread and flour and their links to the fiscal budget deficit and poverty reduction, remain a policy dilemma.

Notes

1. Specifically, following Mohammed Ali's failed attempts to develop a protected industrial economy in the early 1800s, the period from 1840 to 1930 was marked by agreements between the European powers and the Sublime Porte, which underwrote 90 years of almost perfectly free trade. This ended in the period 1930-50 as Egypt gained tariff autonomy and embraced protectionist policies. Additionally, during World War II, a system of direct controls for distributing food and raw materials and for regulating prices was created and never fully dismantled after the war. See Hansen and Nashashibi 1975 and historical references therein.

2. These events included the Egyptian-Czechoslovak arms deal of 1955; relations with the United States concerning the World Bank Aswan High Dam loan; the Suez Canal nationalization; the British-French-Israeli aggression and the Suez War; and the subsequent foreign exchange and trade blockade by the United States, Britain, and France.

3. Hansen and Nashashibi (1975) observe that planning per se need not distort acreage choices of farmers nor necessarily lead to suboptimal cropping patterns, but it did, according to their methodology.

4. There is also an aberration in our exchange rate series owing to a black market rate outlier in 1985. We have experimented with smoothing out this aberration and found that it is of little consequence to the NRA spike observed around this time. Price trends are the drivers.

5. In an earlier period, the cotton production area had been restricted to reduce the supply of Egyptian long-staple cotton on world markets, which were dominated by Egypt's exports at that time (but this was not the case in the more recent times discussed above).

6. Also, until 1965 prices and regulations were undoubtedly influenced by the U.S. PL-480 program, which offered subsidized corn and wheat import credits to Egypt.

7. Compulsory delivery was reinstated for two years in 1985 and 1986.

8. www.customs.gov.eg/customs_tariff/customtable_tariff.html.

9. For the urban poor of Cairo, the comparable number is 39 percent (Ahmed and Bouis 1998).

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PART III

SOUTHERN
AFRICA

MADAGASCAR

*Fenohasina Maret**

Agriculture is a key economic sector in Madagascar, but its performance since the 1950s has been insufficient to cope with demographic pressures or to contribute to a significant reduction of poverty. Madagascar's agricultural sector accounts for nearly 30 percent of gross domestic product (GDP) and 40 percent of merchandise export earnings, while providing livelihood to 73 percent of the total population.¹

The incidence of poverty is very high in the rural areas, where it reaches 77 percent. The sector remains vulnerable to external shocks. According to 60 percent of focus groups convened in a 2001 commune census (Trine 2004), variations in producer prices are the main cause of deteriorating living standards. Population growth from 4.2 million in 1950 to 18 million in 2004 (INSTAT 2005) also plays a key role, having put intense pressure on the agricultural sector.

Food insecurity remains a severe problem. Despite the need to increase production, agriculture continues to have low productivity and high vulnerability to climatic conditions as well as to world price fluctuations. In addition, several periods of civil unrest and political uncertainties have disrupted the rural economy and discouraged investment. Natural conditions for farming are relatively favorable, however, and Malagasy agriculture is quite diversified relative to other African countries.

Economic and financial policies have not provided much support to the agricultural sector, reflecting in part the very low political weight of the rural and farming population. Key agricultural exports and inputs have been taxed, and

* The author is grateful for help, either with data or with comments, to Dera Andriambololona, Xavier Maret, Bart Minten, Jean Nirison, Tojo Rakotoniriana, Jean Marie Rakotovao, François Rasolo, Henri Abel Ratovo, and Roland Razafindraibe, and for helpful comments from workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Maret (2007).

marketing chains have been heavily regulated. The weakness of the industrial sector makes exports of agricultural products a key source of foreign currency, despite the volatility of world prices of primary commodities. Imports, mainly composed by manufactured products, have been subject to licensing and tariffs, imposing a further distortion against agriculture.

Ensuring the full potential of the agricultural sector and increasing rural standards of living remain key challenges for Madagascar. After gaining its independence from France in 1960, the country went through three different economic regimes: the postindependence period, when the economy was still closely linked to France (1955–71); the socialist economy period (1972–88); and gradual liberalization (1988 to date). Through all three periods agricultural output per capita declined steadily.

This chapter analyzes government policies and reforms as they affected the agricultural sector from 1955 to 2004, with a view to ascertaining current policy challenges and choices that could be useful for policy makers molding the future of the sector. Direct and indirect distortions are computed for cassava, cloves, cocoa, coffee, maize, pepper, rice, sugar, vanilla, and yam. These commodities represent nearly 70 percent of the country's value added in agriculture, excluding fishery and forestry.

A general finding of the analysis is that producers' incentives were increasingly distorted in favor of urban consumers during the state intervention period of the 1970s. Those distortions were then significantly reduced for most of the covered commodities as a result of the liberalization policies that were initiated beginning in the late 1980s; the exceptions are sugar and vanilla, where domestic market inefficiencies still isolate producers from developments on world markets.

The chapter begins with a summary of the historical background and the evolution of policy conducted in Madagascar before independence. Then the chapter looks at the history of economic growth and structural changes since the 1960s. The main part then describes the estimates of distortions. Some prospects for reform conclude the analysis.

Policy Evolutions before the 1960s

In the early 1950s, as in most other French colonies and overseas territories, Madagascar implemented a development plan that strengthened its economy and contributed to its diversification. Madagascar's performance in the 1950s relied heavily on its agricultural sector, and some progress was achieved in extending the value added chain to food and other agricultural processing. The country benefited from its membership in the CFA franc zone, which facilitated trade access and limited exchange rate exposure, as well as from having relatively good infrastructure and

institutions. Outside of cloves, coffee, and vanilla, most agricultural production remained centered on staple food items such as rice. As a result, competitiveness with foreign food products limited increases in most agricultural producer prices, and exports of cash crops (mainly cloves, coffee, and vanilla) remained vulnerable to external shocks as well as to weather.

The satisfactory economic performance over the 1950–60 period was accompanied by a 26 percent increase in population. This population boom, to 5.3 million inhabitants in 1960, reflected an average annual growth rate of 2.3 percent, in contrast to an estimated annual average of 1 percent over the previous three decades. Demographic change involved a rising share of youth as well as geographical and rural-urban disparities that started to exacerbate poverty issues. On the one hand, school enrollment increased substantially (by 80 percent), and the schooling rate reached 45 percent, exceeding the performance of most developing countries at the time. On the other hand, nonagricultural employment remained broadly stagnant over the 1950s, except for an increase in civil servants, and nothing had been done to improve agricultural employment (no professional training was provided, and most agricultural school graduates joined the civil service). Moreover, the deficiency of animal protein and fats in human diets was not addressed, even though the caloric intake increased by 7 percent over the period. Annual, per capita agricultural income remained very low, at about \$202, including the estimated value of food produced and consumed at home. Agriculture was the dominant economic and export activity in the 1950s. Crop production grew by nearly 4 percent per year on average, despite the negative impact of a cyclone in 1959 that reduced output by 8 percent in that year. Cattle herding had a much less satisfactory performance, growing by only 7 percent over the period.² At the end of the 1950s, agricultural production was quite diversified and relatively resilient to external shocks. Rice, the staple food product for the Malagasy population, accounted for 43 percent of total production value, followed by coffee (14 percent), sugarcane (6 percent), cassava (5 percent), potato, vanilla, and cloves (3 percent each), and various less-important products.

Economic activities in the mining, energy, and industry sectors grew faster than agricultural production in the 1950s, but they remained relatively small as a share of the economy, equivalent to less than 15 percent of agricultural value added in 1960. Most of the growth in the industrial sector, moreover, resulted from food processing activities, including rice milling, sugar refining, and soft drink production, as well as cotton, sisal, and tobacco processing.

Imports in the 1950s grew at a similar rate as exports, and the ratio of exports to imports remained stable at around 70 percent. However, imports of capital goods and production inputs were fairly constant over the period, while imports of food products and other consumption goods increased by 45 percent. This

increase reflected a rise in nonagricultural wages of nearly 150 percent over the period, and because import prices increased by much less, urban workers favored imported products, which maintained downward pressure on domestic food prices. Rural producer prices increased by only 30 percent over the decade.

In 1960, 93 percent of Madagascar exports were agricultural products. These exports accounted for 20 percent of agricultural production valued at producer prices. The share of these exports going to the CFA zone, where some products benefited from preferential treatment, fell from nearly 90 percent in 1950 to about 75 percent in 1960. Although export volume growth was greater than production growth until 1958, it was also more sensitive to external shocks.

Growth and Structural Changes since the 1960s

Madagascar's economic development and policy making since the 1960s has been strongly influenced by succeeding schools of economic development thought (from colonialism to socialism to liberalism) and a succession of political shocks.³ The economic takeoff of the Malagasy economy that was initiated in the 1950s continued in the 1960s after independence from France in 1960. Increasing state intervention after 1972 resulted in the implementation of a socialist model and a decline of productive activities. The departure from the CFA zone in 1974 also contributed to economic underperformance, as the new Malagasy franc was overvalued and protected by foreign exchange restrictions until 1994, when the currency was allowed to float freely and was devalued by more than 60 percent.

In the 1980s, stabilization and structural adjustment programs were implemented to reduce economic distortions and restore macroeconomic equilibrium, following the failure of the economic development policies of the 1970s. The turnaround of economic activities was modest, however, highlighting the partial and gradual character of the reforms. The reforms focused on exchange rate and international trade liberalization, price deregulation, and state withdrawal from economic and commercial activities. Quantitative restrictions and tariffs remained high, nevertheless, with an important negative impact on external trade, illustrating the country's inward-looking development strategies inherited from the 1970s and 1980s (Pryor 1990). Progress was interrupted by a political crisis in 1991 and the withdrawal of the donor community until 1996. During this period, real GDP per capita declined by 2.7 percent per year, on average, reaching its lowest level in 1996 at about US\$200.

A renewed track record of broadly satisfactory economic performance under new adjustment programs instituted since 1997 was temporarily set back by a new political crisis in 2002. This experience highlights the persistent lack of resilience of the political system and the need for further reforms, including establishment

of a secure and reliable institutional environment and the pursuit of progress toward a market-oriented economy.

The agricultural sector has performed poorly since the 1960s. Productivity of staples has stagnated at low levels. While the availability of agricultural infrastructure and services has improved marginally, it is still at a low level. Recent improvements in access to output and input markets and in transportation have not proven sufficient to drive a significant turnaround of agricultural activities. The structural adjustment policies since the mid-1980s have improved the market framework by removing most of the market distortions through a devaluation of the Malagasy franc, a reduction in import barriers, market liberalization, and privatization of public enterprises. These changes have not been enough to stimulate rapid output growth in rural areas; a reduction in overall public investments and possible declining efficiency of these funds, the lack of an emerging private sector, the degradation of the natural resources base, and relatively large risks in agriculture have led to little supply response (Minten 2006). As a result, adoption of modern agricultural technologies has been low, leading to an agricultural system with low land and labor productivity.

There is little doubt that agriculture can contribute to poverty reduction through multiplier and participation effects (Christiaensen, Demery, and Kühl 2005), but the design of a proper policy mix to ensure sustainable development and higher productivity of the sector has remained unsatisfactory. The problems to be addressed, from macroeconomic issues to microeconomic and institutional ones, are complex and include lack of infrastructure, poor institutional capacity, lack of proper economic incentives, and market failures in input and output markets— together these factors have compounded the difficulty of designing effective poverty reduction strategies rooted in rural sector development. Removing distortions to agricultural incentives will have to be accompanied by the implementation of strong sectoral policies and the emergence of frameworks conducive to private sector development, including institutional reforms to provide training and education, build trust and transparency, and improve credit access; provision of research and extension services for staple foods, decreasing overreliance on rice; and security and development of road and irrigation infrastructures (Minten 2006).

The transition period of the 1960s and the socialist experiments of the 1970s

The influence of the French remained strong in economic and financial activities after Madagascar gained its independence in 1960. Agricultural production and marketing, as well as policies, remained broadly unchanged. Small traders organized the marketing of rice with the parastatal Office of Rice Marketing and

Stabilization (*Bureau de Commercialisation et de Stabilisation du Riz*) during the First Republic (1960–72). This agency fixed minimum and maximum prices, provided credit to farmers, and organized rural associations. Agricultural policies aimed at increasing land under cultivation through large irrigation schemes (such as Lake Alaotra, Marovoay, and the Mangoky Delta), and agricultural extension activities complemented these irrigation efforts by promoting the use of modern inputs and technology, as well as by introducing improved equipment for rice cultivation.

The focus of economic policy turned in the early 1970s to an increasing intervention by the state in productive and commercial activities. The government of General Gabriel Ramanantsoa initiated this process in 1972 by nationalizing several large companies, starting to regulate and control numerous prices, and imposing state monopoly on various products, including rice. Madagascar departed from the CFA zone in 1974, in favor of exchange controls at an overvalued exchange rate. The government of Didier Ratsiraka, who assumed power in 1975, pushed these socialist trends further. Convinced that a lack of investment was at the root of the lack of economic performance, the government initiated a large and unsustainable investment program in the late 1970s that relied on foreign financing and money creation (Pryor 1990).

Increasing intervention by the state, which implemented rural development policies rooted in socialism, led to a significant reorganization of Madagascar's agricultural sector in the 1970s. The new socialist government that came to power in 1972 got rid of the private marketing sector that was perceived as predatory. Agricultural policies were then anchored around state control of prices and marketing, taxation of export crops, and protection of the industrial sector and urban consumers. Shortly after assuming power in 1975, Ratsiraka's government decreed that holdings in excess of 500 hectares would be turned over to landless families, and it is reported that 500,000 hectares of land had already been processed under the program by the end of that year (Library of Congress 1994).

This redistribution of land, which aimed at creating collective forms of farm management (cooperatives and state farms), was accompanied by state intervention in all activities of the agricultural sector. The Ministry of Agricultural Production oversaw the activities of more than 70 parastatal agencies in the areas of land development, agricultural extension, and research activities. Moreover, the collection, transformation, and marketing (domestic and external) of key agricultural products were put under state control. Domestic agricultural prices were subsidized and kept low to favor urban consumers, which resulted in declines in domestic production and higher imports for such commodities as rice. Taxes and economic barriers were put in place to allow each village or neighborhood government (*fokontany*) to benefit from agricultural production and to control product movements.

While an objective of the interventions was to stabilize the prices of export crops (cloves, coffee, and vanilla), the interventions ended up penalizing producers of these crops. Producers received only 40 percent of world prices for coffee and only 25 percent of world prices for cloves and vanilla. Yet, from 1974 to 1987, more than half of Madagascar exports were concentrated on coffee and vanilla (around 30 percent were from coffee). Because of its potential and through the levying of export taxes, the agricultural sector was contributing a large fraction of the government budget, including the public investment program aimed at developing industrial activities.

The inefficient system of agricultural supply and marketing that resulted from state intervention in the 1970s became a major factor inhibiting agricultural development. From 1973 to 1977, one major parastatal agency, the Association for the National Interest in Agricultural Products (*Société d'Intérêt National des Produits Agricoles*, or SINPA) had a monopoly in collecting, importing, processing, and distributing a number of commodities, most notably rice. Corruption leading to shortages of rice in several areas resulted in social unrest in 1977, and the government was forced to take over direct responsibility for rice marketing. In 1982, SINPA continued to control a large share of all distribution for many agricultural commodities, and it subcontracted many smaller parastatal agencies to handle distribution in certain areas. In the cash crop and export sector, the state took over marketing of the main crops through stabilization boards for cloves, coffee, vanilla, and pepper. Public enterprises were put in charge of collecting and marketing the crops, fixing prices at each stage of the marketing chain, and leaving the actual farmgate price as a residual.

The economic policies of the 1970s led to recession and higher inflation, as well as to a severe decline in per capita agricultural output. These outcomes were exacerbated by high volatility and a declining trend in world agricultural prices. Madagascar's GDP per capita declined by an annual average of 1.6 percent in the 1970s. The FAO index of agricultural production per capita started to decline in 1975 and by 2005 was only one-third of its 1975 level, and the large investment program resulted in a balance of payments crisis. Given the policy biases against agriculture, peasants started to focus on food security and household self-sufficiency: they developed staple food crops and increasingly ignored cash crops, leading to the development of a system of nonmonetary and highly vulnerable autarky in the rural sector.

The gradual adoption of liberalization since the 1980s

The failure of the socialist development policies and the increasing inability of the government to subsidize prices led the Ratsiraka regime to enact a series of structural adjustment reforms during the 1980s. These included the removal of

government subsidies on the consumer price of rice in 1984 and the disbanding of the state marketing monopoly controlled by SINPA in 1985. The Malagasy government also liberalized agricultural exports gradually. The elimination of export taxes on nontraditional products in 1985 was extended to all exports, with the exceptions of coffee, cloves, and vanilla, in 1987. Export taxes were removed from coffee and cloves in 1988 and from vanilla in 1997. The currency was devalued by 55 percent in real terms in 1987, and a liberalized import system was implemented a year later, ending the intervention of the state in the allocation of foreign exchange. Currency devaluation in 1994 was accompanied by the official liberalization of the foreign exchange market.

The commercialization of rice and other commodities continued to decrease in the second half of the 1980s, as gradual implementation of structural reforms and the persistence of bottlenecks, such as inappropriate transportation infrastructures, undermined the new policy stance. Rice growers responded by moderately expanding production by 9 percent during the latter half of the 1980s, whereas rice imports dropped dramatically, falling by 70 percent between 1985 and 1989. However, the Ratsiraka regime failed to restore self-sufficiency in rice production, and rice imports rose again in 1990. In 1992, rice production occupied about two-thirds of the cultivated area and produced 40 percent of total agricultural income, including livestock, fishing, and forestry.

Other food crops witnessed small increases in production from 1985 to 1992. Cassava, the second major food crop as measured by area planted (almost everywhere on the island) and probably by quantity consumed, increased in production from 2.14 million tons in 1985 to 2.32 million tons in 1992. During this same period, corn production increased from 140,000 tons to 165,000 tons, yam production increased from 450,000 tons to 487,000 tons, and banana production dropped slightly from 255,000 tons to 220,000 tons.

Among the exports, coffee prices witnessed a boom during the first part of the 1980s, making coffee the leading export crop of the decade. Prices within the coffee market gradually declined during the remainder of the 1980s, although they rebounded in 1992. Cotton traditionally has been the second major export crop, but most output during the early 1980s was absorbed by the local textile industry. Although cotton output rose from 27,000 tons in 1987 to 46,000 tons in 1988, once again raising the possibility of significant export earnings, the combination of drought and a faltering agricultural extension service in the southwest contributed to a gradual decline in output to only 20,000 tons in 1992.

Two other export crops—cloves and vanilla—also declined in importance from the 1980s to the 1990s. Indonesia, the primary importer of Malagasy cloves, temporarily halted purchases in 1983 as a result of sufficient domestic production, leaving Madagascar with a huge surplus. A collapse in international prices

for cloves in 1987, compounded by uncertain future markets and the normal cyclical nature of the crop, led to a decline in production from a high of 14,600 tons in 1991 to 7,500 tons in 1993. Similarly, the still state-regulated vanilla industry (state-regulated prices for coffee and cloves were abolished in 1988–89) found itself under considerable financial pressure after 1987 because Indonesia reentered the international market as a major producer; in addition, synthetic competitors emerged in the two major markets of the United States and France. As a result, vanilla production declined from a high of 1,500 tons in 1988 and 1989 to only 700 tons in 1993.

Agriculture and livestock are closely linked within the farming system.⁴ More than half the farms raise cattle. Livestock production was limited in part, however, because of traditional patterns of livestock ownership that hampered commercialization. Its rate of growth was around 1 percent yearly. Beef exports in the early 1990s decreased because of poor government marketing practices, rundown slaughtering facilities, and inadequate veterinary services. All but 1 percent of cattle are zebu. The Food and Agriculture Organization estimates that in 1991 Madagascar had 10.3 million cattle, 1.7 million sheep and goats, and 21 million chickens.

Trade policy

Madagascar participates actively in the multilateral trading system. It became a member of the World Trade Organization in November 1995. The country also is involved in regional trade agreements with the Indian Ocean Commission (created in 1984), the Regional Integration Facilitation Forum (launched in 1992), the Common Market for Eastern and Southern Africa (from 1995), the African Growth and Opportunity Act (from January 2001), and the Southern Africa Development Community (only in 2005). Many of Madagascar's exports to the European Union enjoy nonreciprocal preferential treatment in the form of exemption from import duties. Madagascar also benefits from preferential tariff treatment granted by Australia, Canada, the European Union, Japan, New Zealand, and the United States under the Generalized System of Preferences (WTO 2001).

Since Madagascar liberalized its trade regime in the early 1990s, its trade policy framework has been based on tariffs (WTO 2001). Extraregional tariffs are still restrictive. The simple average of applied most favored nation (MFN) import duties is 16.2 percent in 2001. Tariffs on the agricultural sector alone are 17.7 percent on average. Import duties and taxes continue to constitute a significant source of government revenue. An import tax of 2 percent and a custom stamp duty of 1 percent also apply to imports. An excise duty ranging to over 100 percent

is levied on petroleum, alcoholic and nonalcoholic beverages, and tobacco products. A value added tax of 18 percent is also collected on sales of goods and services except for pharmaceuticals, medical equipment, news print books, and brochures.

Madagascar has bound customs tariffs at 30 percent. MFN customs tariff rates have been reorganized from 13 bands to 4 bands ranging from zero to 30 percent. The government wishes to simplify the tariff structure to one rate, but an impact study is yet to be undertaken to examine the need to smooth adjustment for sensitive products and sectors. To secure custom duties revenue, the Malagasy authorities have contracted with a preshipment inspection company for all imports worth \$1,000 or more. All quantitative restrictions on imports have been eliminated, except for prohibitions or prior authorization requirements maintained under international conventions for health, phytosanitary, or security reasons or on products deemed strategic by the government—including vanilla and precious stones in Madagascar's case (WTO 2001).

With its difficulties in balancing its budget, the country cannot afford to provide farm price support programs or match the developed countries' export subsidies (FAO 2003). Elimination of export taxes, liquidation of marketing boards, and abolition of monopolies held or exclusive rights exercised by state-owned companies were a good step forward, although agricultural incentives have shown only very moderate improvement. That is because, among other reasons, the vacuum left by the elimination of the boards has not been filled, and the country's capacity to respond to new opportunities has been very limited (WTO 2001). Nonetheless, with the move to a more open trade policy, Madagascar has increased its trade volume in recent years, with textile and tourism the most rapidly expanding exports.

Evolution of rural poverty since the 1960s

Unsatisfactory economic and financial performance since the 1960s has contributed to a lack of overall progress in poverty reduction. The 1984–85 agricultural census estimates that at that time, 8.7 million people lived in rural areas and that 65 percent of the economically active population within these areas lived at the subsistence level. Based on the 2001 household survey by Madagascar's National Statistics Institute (INSTAT), almost 70 percent of the population in Madagascar was poor, with about 90 percent of the poorest quintile living in rural areas and engaged in farming. The data also point to wide variations among provinces.

Significant correlates of poverty are household residence in rural areas (which is associated with 30 percent lower consumption) and the occupation of the head of

the household as a small-scale farmer. The first national household survey was done in 1993, and over time rural areas have consistently been shown to be worse off than urban areas. Poverty in the primary sector worsened between 1993 and 2001 by almost 9 percent, while falling in the secondary and tertiary sectors. Poverty levels have remained very high over the years and were still estimated in 2004 at about 77 percent in rural areas, compared with 54 percent in urban areas. Poverty reduction in urban areas was mainly driven by export processing zones and tertiary sector developments (Minten, Randrianarisoa, and Randrianarison 2003).

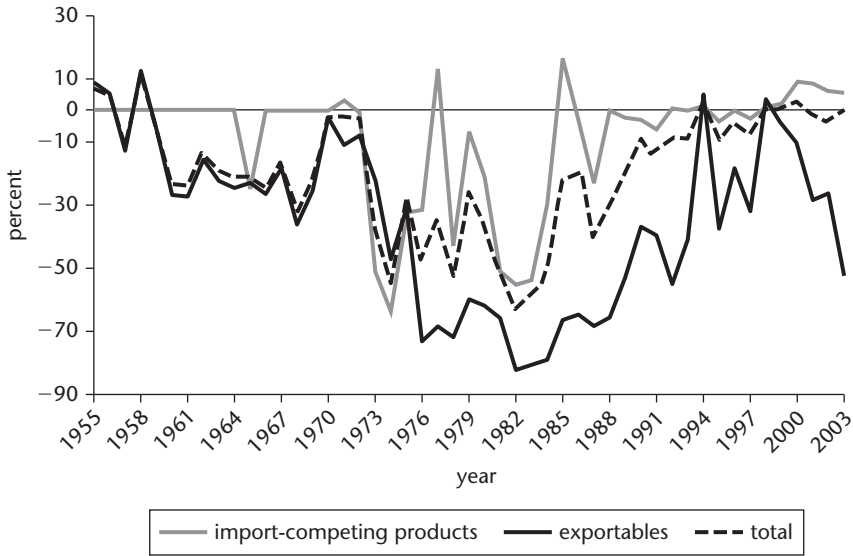
Direct and Indirect Distortions to Agricultural Incentives

In this section, the effect of the three different phases of policy reform on farmers' incentives is quantified. The main focus of this study's methodology (see appendix A and Anderson et al. 2008) is on government-imposed distortions that create a gap between domestic prices as they are and what they would be under free market conditions. Since the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in non-agricultural sectors for comparative evaluation. More specifically, I compute nominal rates of assistance (NRAs) for farmers and an NRA for nonagricultural tradables for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA).

As mentioned earlier, the immediate period after independence was recorded as the most favorable time for Madagascar's farmers in the last half century. Government policy toward primary agriculture was relatively neutral. Data for estimating NRAs are available for only four farm products (cassava, rice, sugar, and yam) for the period before 1966, but their weighted average was 1 percent in 1955–59 and –20 percent in 1960–65 (figure 3.1). The country was then a net exporter of rice and sugar.

The socialist structure of the early 1970s allowed the government to extract rents by indirect taxation, so even though agricultural producers were exempt from income taxes, use of various forms of government “hand-on” policies, such as export taxes, licensing, and marketing boards, eroded farmers' revenues and favored corruption and rent-seeking for political elites.⁵ Export duties were one of the principal sources of government revenue in the early 1980s, providing 30 percent of total revenue in 1983.

The impact of those policies on farmer incentives is clear from figure 3.1. Producer prices were not allowed to rise with international prices in 1973–74, causing

Figure 3.1. NRAs for Exportable, Import-Competing, and All Covered Farm Products, Madagascar, 1955–2003

Source: Data compiled by the author.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

the NRA to fall from close to zero in the early 1970s to -50 percent. As international prices returned to normal, the prices of importables rose again but those of exportables fell even further, and their NRA averaged between -60 and -75 percent in the late 1970s and 1980s. Even when the reforms begun in the mid-1980s started to have an effect, they continued to favor import-competing farmers over those producing exported goods.

By the late-1980s, when international food prices were exceptionally low, the degree of taxing of farmers had returned to the level of the late 1960s (around -25 percent), and thereafter it came even closer to zero. By the turn of the century it was virtually zero, although the antitrade bias within the sector remained—the NRA for exportables in 2000–03 was still -30 percent, while the NRA for import-competing farm products was 7 percent. Even within each of those two subsectors, there is still considerable variance in the NRAs, so the chapter examines the situation for individual crops before comparing the overall agricultural situation with that of producers in nonfarm activities.

Food crops

The main food crops covered in our study are rice, cassava, maize, and yams; each is addressed here in turn.

Rice

Rice is the staple food in Madagascar, and paddy rice is the country's most important food crop. It is grown by about 70 percent of the population and covers about 3 million acres, or 50 percent of the total area under cultivation. Small-holders dominate production, and farms consume an estimated 80 percent of production. The Malagasy consumption of rice per capita is about 120–140 kilograms per year. Rice productivity has been low and stagnant for the last 40 years with yields of around 2 tons a hectare, while other countries like Indonesia and Vietnam have managed to increase their rice yield three- or fourfold. Annual rice production grew by less than 1 percent during the 1970s, when cultivated paddy area expanded by more than 3 percent per year.⁶ Land tenure problems, poor control of water, and lack of agricultural inputs are still obstacles affecting rice cultivation.

The share of rice available for marketing in the rapidly growing urban areas declined from more than 15 percent of the total crop in the early 1970s to nearly 10 percent during the latter part of the decade (Dorosh and Minten 2005). As a result, Madagascar became a net importer of rice beginning in 1972. By 1982, it was importing nearly 200,000 tons annually, equal to about 10 percent of the total domestic crop and roughly equal to the demand from urban customers. Even within the rural areas, many people are net buyers of rice, because only a minority of farmers produce enough to be net sellers.

Government policies have contributed to the poor performance of the rice sector. Even though low labor costs and little use of inputs mean that Malagasy rice has low production costs, its competitiveness at the international level is lost in the value chain because of the large marketing costs caused by remoteness, transport costs, and the multiple actors involved in that chain. The lack of maintenance of the fragile transportation infrastructure in the late 1970s and early 1980s was a major contributing factor to the decline in Madagascar's marketed agricultural production. Government support of farm credit and agricultural inputs was small or absent in many areas, and credit flows were skewed toward the estates and wealthier small-holders (Pryor 1990).

The trends in the NRA for rice can be seen in table 3.1. The minimum pricing scheme established by the government through the parastatal agency SINPA basically subsidized imports at the expense of export crops. The resulting low producer price and government neglect in providing inputs discouraged production. The discrepancy between the world price and the official domestic price was exacerbated by

Table 3.1. NRAs for Covered Farm Products, Madagascar, 1966–2003
(percent)

Product, indicator	1966–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–03
Exportables ^{a,b}	-26.6	-18.1	-60.9	-73.9	-63.6	-33.4	-17.7	-29.3
Vanilla ^c	-52.3	-39.0	-56.9	-76.4	-85.2	-77.8	-28.5	-12.8
Cocoa	-31.6	-30.3	-71.0	-68.4	-60.5	-25.6	-22.8	-18.5
Pepper ^c	-33.9	-4.1	-39.1	-46.7	-80.0	-30.2	-62.0	-10.2
Cloves ^c	-44.7	-18.1	-80.6	-91.7	-84.9	-62.7	-27.4	-18.7
Coffee	-26.6	-15.3	-63.0	-73.5	-58.5	-28.9	-12.7	-37.6
Import-competing products ^{a,b}	—	-28.0	-20.1	-42.2	-3.0	-1.7	-0.7	7.4
Nontradables ^a	0.0	0.0	0.0	0.0	-0.2	-0.2	-0.2	0.0
Yam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cassava	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed trade status ^a								
Rice	-22.6	-21.5	-20.1	-42.2	-2.7	-1.9	-0.9	7.4
Maize	-27.6	2.7	17.7	-4.1	-6.6	28.7	-14.1	29.5
Sugar	-1.9	-1.0	-2.5	-1.1	-0.4	-0.2	-0.8	-0.7
Total of covered products ^a	-24.0	-20.0	-37.8	-51.4	-26.2	-7.5	-3.7	-0.5
Dispersion of covered products ^d	23.3	23.3	35.6	37.2	39.8	37.1	28.7	23.8
Percent coverage (at undistorted prices)	44	54	71	75	68	71	72	66

Source: Data compiled by the author.

Note: — no data are available.

a. Weighted averages, with weights based on the unassisted value of production.

b. Mixed trade status products included in exportable or import-competing groups depending upon their trade status in the particular year.

c. Data for vanilla, pepper, and cloves are missing for 2002 and 2004.

d. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

the way the government controlled the quantity of rice imports and regulated rice domestic marketing, particularly during the late 1970s and early 1980s. Domestic producer prices for paddy were set without reference to border prices and were kept substantially below import parity levels (Dorosh, Bernier, and Sarris 1990). This continued to be the case into the current decade, according to Minten, Randrianarisoa, and Randrianarison (2003), because the factors determining the pricing of rice in Madagascar are the time of harvest, storage costs, the distance to urban centers, access to roads, the availability of imported rice, the level of wealth of each locality, and the climatic condition and incidence of natural disasters.

Domestic marketing of rice was liberalized after 1988, which reduced the distortions to farmers. Since 2000, the tariffs and domestic taxes applied to rice imports have resulted in a slightly positive NRA for rice (7 percent in 2000–03). Rice continues to be a political crop and the government continues to intervene, particularly by making unpredictable changes in the import tariff and in the allowed volume of imports by private actors (notwithstanding the formal removal of government controls along the value chain). This fact seems to have favored corruption and rent seeking. Dorosh and Minten (2005), in their study on the rice crisis that occurred in 2004, note that transparent and preannounced tariff reductions could mitigate the effects of increases in the price of imported rice on poor consumers, even if they resulted in small losses of tariff revenues.

Cassava

Cassava leaves and tubers are edibles. Annual production is about 2.5 millions tons, of which a very small quantity of about 15,000 tons are used industrially for making tapioca and candy at four locations, in Anjiro, Marovitsika, Vodiala, and Moramanga. Cassava is mainly used for animal feed and is also very important for food consumption as a buffer crop during lean seasons. In the southern part of the country, the crop is often dried before consumption. Because of a lack of detailed data on the dried product, however, this study looks only at green (fresh) cassava.

The southern part of Madagascar used to export cassava to neighboring islands but increasing freight and shipping costs have made such exports unprofitable, and the volume of cassava exports has been falling since the mid-1970s. In addition, port infrastructures are poor, and storage capacity is insufficient near the harbor. Competition from French subsidized cassava further reduced incentives. Hence in this study, cassava is classified as nontradable, and the NRA on output is assumed to be zero.

Maize and yams (sweet potatoes)

Similar to cassava, sweet potatoes are classified as nontradable, and their NRAs and consumer tax equivalent (CTE) are assumed to be zero. The trade status of

maize has changed over time. It was an exportable commodity from 1955 to 1972 and then switched regularly between being exportable and nontradable. Imports have increased since 2000. In most of the years in which maize has been imported, the NRA for maize has been positive.

Export crops

Madagascar's main export crop is vanilla, a strategic product that has been an important source of foreign exchange and accounts for more than 30 percent of agricultural exports in recent years.⁷ Good climatic condition, low labor costs, and very high quality make Malagasy vanilla highly competitive and give the country a strong comparative advantage in its production.

A vanilla stabilization fund was created in 1962, and a cartel was formed with Comoros and Réunion to exploit the region's collective market power. The fund, known as CAVAGI, stabilized the price received by producers and financed stockholding costs, with contributions taken from export proceeds after payment of an export tax. The intervention in the 1960s sought to bring stability and equity in the distribution of gains from the vanilla trade (Cadot, Dutoit, and de Melo 2006), accumulating stocks of vanilla in an attempt to raise international prices and to exploit monopoly rents. During the 1970s, intervention grew and rents were appropriated by government and by a limited number of traders. Production was regulated, with farmers required to have a license (valid for three years) to grow vanilla. In addition, the Ministry of Trade required vanilla preparers (processors and stockers) to obtain an annual license. Export taxation became massive, with some farmers receiving less than 8 percent of vanilla's free on board price (Cadot, Dutoit, and de Melo 2006). A specific export tax of \$35 per kilogram was supplemented with an export duty of 15 percent and an export surcharge of 11 percent.

In their study, de Melo, Olarreaga, and Takacs (2001) conclude that in addition to distortions stemming from taxes and marketing controls, the cartel overestimated the country's degree of market power in international vanilla markets and thus opened the door for competition from Indonesia. The international price of Malagasy vanilla initially rose, but the cartel's high prices discouraged consumption so much that revenue was reduced. In addition, the cost of stockpiling the accumulating inventories escalated beyond the amount CAVAGI could finance out of its revenue. In the end, three-quarters of the stock of inventories, which by 1990 exceeded four years' volume of exports in good times, was destroyed by burning. This was an extraordinary waste given the high unit value of vanilla and the extreme poverty of the farmers whose output was thus destroyed (Cadot, Dutoit, and de Melo 2006).

Since independence, the NRA for vanilla has fluctuated between -40 percent and -60 percent, which implies heavy direct taxation of producers. Misalignment of the foreign exchange market made the situation worse, as did the explicit introduction of an export tax in the mid-1970s. The NRA on output averaged about -70 percent then and about -80 percent in the 1980s (see table 3.1). The vanilla export tax and most other forms of government intervention were completely removed in 1997, and the NRA has since moved much closer to zero, but the sector has still not recovered.⁸ Sharp price fluctuations during 2000–03, which resulted partially from speculation from large wholesalers and exporters in Madagascar, did not help. The price of a kilogram of vanilla was \$50 in 1999, soared to \$475 in 2004, but then dropped to \$35 in 2005–06, when after deducting marketing costs farmgate prices reached as low as \$15 per kilogram. A possible explanation for the sinking prices for growers is the continuing control of the sector by a small number of traders and processors, who have amassed most of the benefits of the reform. Cadot, Dutoit, and de Melo (2006) tried to determine how much the reforms achieved by themselves by looking at a model that recreated the old policy environment under current market conditions. They found meager improvement in farmers' projected income and concluded that the sources of the remaining distortions stem from the malfunctioning of the market and imperfect information among farmers and traders. Moreover, substitutes for natural vanilla are now more widely used, which means there is more competition among suppliers in international markets and oligopsony among buyers (Rakotoarisoa and Shapouri 2001).

Madagascar's other main export crops are coffee, cloves, pepper, and cocoa, which represented, respectively, 20 percent, 14 percent, 6 percent, and 5 percent of agricultural exports during 1995–2005. Annual production growth has been relatively sluggish, partially because of climatic conditions, while the value of exports has fluctuated sharply as a result of changes in world commodity prices. Green coffee represented around 40 percent of Madagascar's agricultural export earnings during 1995–99, when favorable international prices accompanied liberalization.

Like vanilla, coffee and cloves were regulated and subject to licensing. The marketing board purchased a large part of the crop, which it marketed directly, and it fixed the price for all export transactions. Coffee and cloves were also subject to export taxes and export duties starting in the early 1970s. As shown in table 3.1, NRAs on output for these four export crops followed almost the same patterns as for vanilla and have been negative since independence. This suggests that Madagascar's pricing and exchange rate policies discriminated against these export crops. The NRA on coffee, for example, averaged around -65 percent from the mid-1970s to 1987. But after the deregulation of trade in 1988, those NRAs were reduced and became much closer to zero.

Industrial crops: sugarcane

The sugar industry has been one of the most important food processing activities in Madagascar, accounting for 60 percent of the value of food processing output in the late 1980s. Developing agroindustry was one of the goals of the government after independence, so sugarcane farmers were not discriminated against as other farmers were. The NRA for sugar, even though it has fluctuating with movements in international prices, has averaged approximately zero since the 1960s (see table 3.1). Sugarcane growers do often face long delays in receiving payment for their crop after it is delivered to the state processing factory, however.⁹

The two sugar companies, Siramamy Malagasy and Sucrerie de Nosy Be et de la Cote Est, were nationalized in 1976, extensively rehabilitated in 1985, and combined into a single entity in 1987. The Ministry of Trade fixed prices for sugar put into the domestic market until liberalization in 1989, after which wholesalers and retailers were free to fix their own margins.

Madagascar has been a net importer of processed sugar since 1991, although exports expanded in 1999. The export quota of 7,258 tons to the United States and 10,760 metric tons to the European Community (as of 2001) until recently was generally filled. The sugar company has encountered various difficulties, however, resulting in a production shortfall. The country has stopped exporting to the United States altogether and can barely fill its quota to the European Union. And with the recent reductions in the favored export price under preferential access given by the European Union to ACP (African, Caribbean, Pacific) countries, which is scheduled to expire in 2009, even that trade is vulnerable.

Privatization of the state sugar monopoly was supposed to occur by 2001 as part of market-led reforms, but it is still under debate. Instead, technical assistance for management has been sought. Even though sugar imports are subject to an import tax (35 percent) and a value added tax (20 percent), inefficiencies associated with low capacity utilization and low sugarcane yields continue to keep the industry uncompetitive internationally. Domestic distribution of sugar also is inefficient, with only five firms licensed to serve the domestic wholesale market.

The nonagricultural sector

Madagascar's manufacturing sector is dominated by food processing and beverages, agribusiness, light manufacturing, construction, soaps and detergents, packaging, textiles, and footwear. After independence, the government adopted an import-substituting trade regime and public investment strategy. Then toward the mid-1990s, Madagascar eliminated all types of currency rationing in trade as well as quantitative restrictions on imports apart from those arising from the application of international conventions and those maintained for health and security

reasons. Export restrictions in almost all areas have also been eliminated, as have foreign exchange controls. By the end of the 1990s, the average MFN tariff for the manufacturing sector, defined as Major Division 3 under ISIC (International Standard Industrial Classification) Revision 2, was 16.2 percent (WTO 2001).

Since the start of the reform process, the government has progressively encouraged the emergence of a private sector. Manufacturing activities are increasingly concentrated in the export processing zones, where textiles and clothing constitute a major subsector.¹⁰ According to a World Bank report (2005) assessing Madagascar's investment climate, even though firms rank corruption and tax rates lower than they are ranked in other African countries, a poor business environment affects the whole private sector, and price controls and inflation are major constraints. Firms that are not in export processing zones suffer from low productivity relative to the firms in the zones, which are devoted solely to exports.

The mining sector was nationalized in 1975 and then opened to foreign investment for prospecting in 1985; private investment and exploitation has been encouraged since 1990. The sector is still underdeveloped, however, despite its potential.

The services sector contributed about 57 percent to the country's GDP in 2004, with tourism the largest component. Financial and telecommunication services underwent liberalization and privatization, and some satisfactory performance and progress is now occurring. Improvements in the transportation system remain on the government's list of goals for its economic reform program.

To compare the rates of assistance to nonagricultural sectors with those for agriculture, I first assume there are no distortions to noncovered farm products except those operating through the exchange rate system, so the weighted average NRA for covered and noncovered farm products is somewhat less negative than for covered products alone (top rows of table 3.2). But because nontradable farm products are assumed to have zero NRAs, the weighted average NRAs for just the tradable parts of agriculture—because of the dominance of exportables—are very negative. The NRAs for nonagricultural tradables, by contrast, are positive. They are calculated using mainly import tariffs for import-competing sectors and export subsidies and taxes for exportables, in addition to the exchange rate distortions. Because of a lack of available data, nontariff barriers, which were very common during the 1970s, are not taken into account, but the NRAs still suggest heavy assistance to nonfarm tradables throughout the period. Hence the relative rate of assistance is even more negative than the NRA for agriculture (figure 3.2 and middle rows of table 3.2).

The bottom rows of table 3.2 show what the key distortion indicators would be had the analysis not taken into account the distortions in the market for foreign currencies. The differences are not very great, suggesting they alone were not a

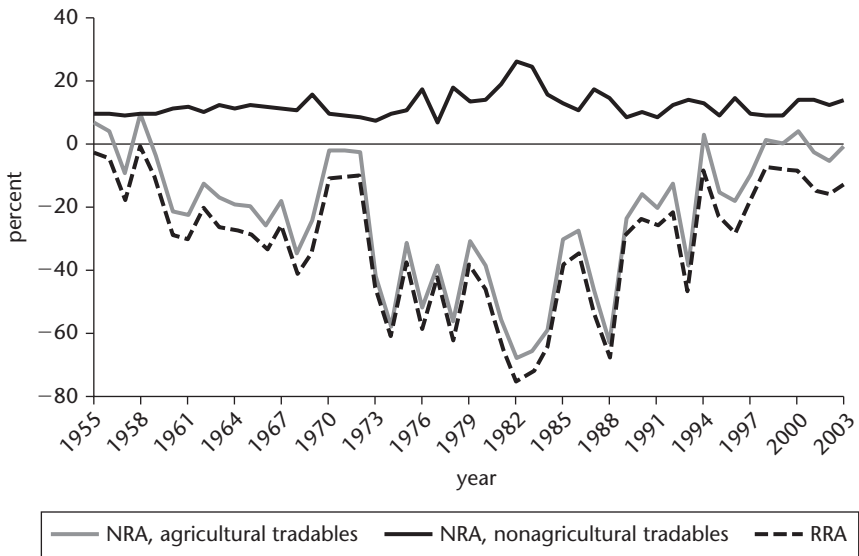
Table 3.2 NRAs in Agriculture Relative to Nonagricultural Industries, Madagascar, 1966–2003
(percent)

Indicator	1966–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–03
Covered products	-24.0	-20.0	-37.8	-51.4	-26.2	-7.5	-3.7	-0.5
Noncovered products	-1.4	-0.3	-1.0	-1.1	-1.6	-0.6	-0.9	-0.3
All agricultural products	-11.9	-13.5	-27.1	-38.8	-18.2	-5.4	-2.9	-0.5
Trade bias index ^a	-0.40	0.14	-0.47	-0.53	-0.62	-0.34	-0.21	-0.31
NRAs, all agricultural tradables	-25.6	-21.3	-41.6	-57.5	-38.1	-16.8	-8.3	-0.9
NRAs, all nonagricultural tradables	12.4	8.7	13.3	20.0	12.7	11.5	10.2	13.7
RRA ^b	-33.8	-27.6	-48.2	-64.2	-44.8	-25.4	-16.7	-12.9
Memo item, ignoring exchange rate distortions:								
NRA, all agricultural products	-10.1	-13.6	-26.9	-37.7	-17.6	-4.9	-2.5	-0.5
Trade bias index ^c	-0.34	0.17	-0.38	-0.31	-0.58	-0.30	-0.18	-0.31
RRA ^d	-29.1	-27.6	-46.4	-60.4	-42.6	-22.2	-14.1	-12.9

Source: Data compiled by the author.

- a. Trade bias index is $TBI = (1 + NRA_{ag,x}/100)/(1 + NRA_{ag,m}/100) - 1$, where $NRA_{ag,m}$ and $NRA_{ag,x}$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.
- b. The RRA is defined as $100 * [(100 + NRA_{agt}) / (100 + NRA_{nonagt}) - 1]$, where NRA_{agt} and NRA_{nonagt} are the percentage NRAs for the tradable parts of the agricultural and nonagricultural sectors, respectively.

Figure 3.2. NRAs for All Agricultural and Nonagricultural Tradables and the RRA, Madagascar, 1955–2003



Source: Data compiled by the author.

Note: For the definition of RRA, see table 3.2.

very significant contributor to the strong antiagricultural bias that has prevailed in Madagascar until recently.¹¹

Conclusions and Prospects for Further Policy Reform

The pattern of distortions to agricultural incentives clearly has depended very much on the government in power and on its policies. The first president after independence, Philibert Tsiranana, managed to maintain the traditional market structures as well as an acceptable balance between agriculture and the rest of the economy. Agricultural production rose at a modest rate, and the RRA was no worse than -30 percent in those years. The functioning production and transport infrastructure from early independence also contributed to the relative well-being of farmers during this period of the First Republic.

After taking power in 1972, President Ratsiraka turned the intersectoral terms of trade much more against agricultural producers and caused the market to disintegrate. Agriculture faced strong production disincentives, as indicated by the plunge of the RRA to -60 percent by the early 1980s. The government established

a state-owned marketing system to purchase crops and supply farmers with agricultural inputs and consumer goods, but that system did not function adequately either. The resulting shortage of foodstuffs led to the creation of a parallel market that benefited the estates and richer small-holders who had better access to transportation and therefore widened income differentials within the rural area. Heavy taxation, a cumbersome foreign exchange allocation system, and overvalued exchange rates also affected exports negatively. Agricultural production stagnated and imports of staple food became a necessity. In the meantime, Malagasy farmers remained reticent in expressing their discontent with government policies, which continued to be urban oriented.

Distortions were gradually reduced, but not fully eliminated, as part of the market liberalization drive in the late 1980s. Rural areas still have the highest incidence of poverty, however, and the policy reversal did not have much of a positive impact on production, nor has it ensured sustainable growth and development. Yet despite the persistence of distortions, producers seem now to receive a higher proportion of international prices, at least in periods of low international prices.

Progress toward a more market-oriented agricultural sector has not completely reversed the past's disincentives for farmers for three main reasons. First, the reforms have been gradual, partial, and incomplete. Second, political crises and civil unrest have led to "stop-go" reforms. And third, assistance has not been used effectively. As well, rural development projects have been poorly conceived and implemented, and mistrust between public actors and private actors remains (Bene and Beyries 2002).

The phasing out of trade policy biases to agricultural incentives needs to be combined with domestic policies aimed at improving farmers' incentives and income. Indeed, international prices are still far from being the main determining factor in returns to farmers. Baffes and Gardner (2003), in their multicountry analysis, note that world price transmission to average producer prices in Madagascar has been low or nonexistent and that only a moderate improvement in market integration took place following the reforms.

The current evidence shows that the rural sector is still fragmented and badly organized. The essential bonds between production, transformation, and marketing are weak. The Malagasy rural economy remains a mainly subsistence economy. Market failures caused by huge transportation costs and intermediation margins are still present. Downstream operators (collectors, wholesalers, retailers, and importers) are using their monopsonist power and speculating with key primary products. In addition, a minority has important political weight and uses it in rent seeking from the government. There is thus a vicious cycle, where producer prices are low, leaving farmers with little purchasing power to acquire a good standard of living (education, drinking water, electricity, energy, health

services). Their low living standard in turn reduces farmers' human capital and productivity, which are key factors for increasing production and farmers' incomes.

Current domestic policy objectives outlined in the National Program for Agriculture, Farming, Fishing and Agricultural Processing Industries, promise good prospects for Malagasy agriculture (Republikan'I Madagasikara 2005). Also, President Marc Ravalomanana's plan, "Madagascar Naturally," envisions, by 2020, a country devoted to its agriculture, with market-oriented production, and a diversified agroindustry satisfying domestic food needs and exports, closely linked to service sectors providing agricultural credit and research and extension as well as tourism and other services.¹² Under that plan, a policy bias against agriculture through price distortions should no longer be a major dampener to producer incentives. Most of the nonprice interventions needed are well laid out in the Madagascar Action Plan for Rural Development, even if their implementation and feasibility remain a challenge. These measures include greater land security, rural credit access, and irrigation infrastructure plus the promotion of market-oriented activities.

Madagascar's future is firmly intertwined with agriculture and agroindustry. Increasing consumer demand in developed economies for organic food may provide an export opportunity for the country. Minten, Randrianarison, and Swinnen (2005) show that farmers' participation in contract farming with global retailers also promises the development of niche markets abroad, which will help contribute to poverty reduction at home.

Notes

1. Madagascar was ranked 143rd among 177 countries in 2007 on the UN's Human Development Index (UNDP 2007), and its GDP per capita was only \$280 in 2006, equivalent to 77 cents a day (World Bank 2008).

2. Beef accounted for nearly 50 percent of livestock sector revenue, followed by poultry (25 percent), pork (15 percent), and fishing and others (10 percent). Poultry and fresh water fishing contributed the most to growth of the sector in the 1950s.

3. As Minten (2006) points out, it is striking that the three periods of growth (late 1960s, late 1980s, and late 1990s) were each interrupted by social and political crisis.

4. Livestock represents about 35 percent of agricultural GDP. Over 40 percent of total land is used for pasture. Cattle raising is at the heart of the rural economy in much of western and southern Madagascar.

5. The majority of agricultural activities were being run on a small-scale basis as part of the informal sector. As such they were not taxed on the basis of revenue, nor did they receive any form of social security from the government.

6. In the early 2000s, rice accounted for about 50 percent of the value added in agriculture and 45 percent of the calories consumed by an average Malagasy person (Dorosh and Minton 2005).

7. Vanilla is an orchidaceous plant that has a 15-year life span. Harvesting takes place 4 years after planting. Five kilograms of green vanilla are required to produce one kilogram of dry vanilla. The process involves curing, drying, and packing.

8. The state role now is confined to sanitary and quality inspection and to setting the date and place of vanilla marketing each year. Certification attesting to the vanilla's quality and wholesomeness is necessary before it can be exported, to prevent excessive amounts of immature vanilla beans being offered for sale (WTO 2001). The European Union's Stabex fund (export stabilization fund) continues to finance efforts aimed at quality improvements.

9. Payment to growers is basically done in three parts. The first 25 percent is based on a preannounced price and is paid at the time of delivery to the factory gate. The remaining 75 percent is paid in two payments at revised postharvest prices. Prices are fixed by a joint commission representing the company and the growers, together with the Centre Malgache de la Cane et du Sucre (CMCS), an entity responsible for the supervision and regulation of the sugar industry value chain.

10. Because of low domestic demand and low savings, the government adopted a growth strategy based on exports in 1989. Export processing zones (EPZs) were then established, offering various tax benefits and exemptions to attract foreign investors and multinationals. The benefits include a waiver of corporate income taxes, zero import duties and taxes, and free access and movement in foreign exchange (Razafindrakoto and Roubaud 1997). In addition, EPZ firms enjoy preferential market access provided by the United States and the European Union.

11. This is also true in other Africa countries that were using the CFA currency, such as Cameroon and Senegal. See chapters 13 and 17 in this volume.

12. The results sought by the Malagasy authorities are to increase exports by increasing agricultural production (such as rice, maize, and cassava) by 100 percent in 5 years and 200 percent in 10 years, by increasing agricultural exports (such as vanilla, clove, and shrimp) by 100 percent in 5 years and 150 percent in 10 years, by increasing processed exports (such as canned fruits, sugar and sweeteners, and rum) of 50 percent in 5 years and 150 percent in 10 years, and by developing nonfood agroindustrial production (such as essential oils and textiles) by 50 percent in 5 years and 200 percent in 10 years. At the same time, products where the country has a comparative advantage will be identified in order to take advantage of regional market agreement. See Repoblikan'I Madagasikara (2005).

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MOZAMBIQUE

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In recent decades, Mozambique has undergone enormous political and economic transformations. Once a colony of Portugal, the country moved to a phase of socialism after gaining independence in 1975, and then from 1986 the government initiated a program of economic reform aimed at establishing a market economy. Mozambique suffered from more than a decade of armed conflict, however, which together with other socioeconomic changes caused production to continue declining during much of the period to the end of civil war in 1992. Since then, a combination of peace, political stability, economic reform, and large aid flows has helped the country move from being the poorest nation in the world to achieving the highest growth rates in the region. Poverty rates have been significantly reduced and agricultural incomes have increased.

Roughly 75 percent of Mozambicans depend on agriculture for their livelihood (Bias and Donovan 2003). For this reason, government interventions in the agricultural sector have potentially large impacts on many people's welfare. The purpose of this chapter is to analyze and measure the effects of such interventions for a group of agricultural products during the past three decades of economic transformation. We focus on whether interventions effectively tax or subsidize producers and processors of selected agricultural products. We do so by computing different measures of assistance, most notably the nominal rate of assistance (NRA) to farmers for the period 1975–2004. The products analyzed are the main cash

* The authors are grateful to Carla Lopes for research assistance and to Danilo Abdula, Rafael Uaiene, Jorge Tinga and all the staff at GPSCA-MINAG, Norberto Mahalambe, Juan Farfan, Dr. Raimundo Matule, and Finn Tarp for suggestions and for providing data. We also appreciate the helpful comments from workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Alfieri, Arndt, and Cirera (2007).

and food crops: beans, cashew, cassava, cotton, groundnuts, maize, rice, sugar, and tobacco. These products represent about two-thirds of the value of primary agriculture production in the country.

Despite a lack of data availability for some years for prices, margins, and transport costs, the estimated coefficients suggest the existence of three clear periods regarding government intervention in the agriculture sector. In the first period, when the central government imposed fixed or minimum prices, producers were clearly taxed and consumers were subsidized. This period was followed by price liberalization in the 1990s, when producer assistance levels became neutral or positive, mainly because of market reforms and the rationalization of import duties and taxes. In the third period (from the late 1990s), we observe an average reduction of assistance rates and an increase in their volatility, associated with large exchange rate depreciations in the presence of slow price adjustment.

The chapter begins with a brief description of the agricultural sector in Mozambique and then summarizes the main policy interventions in the sector during the three-decade study period. The chapter discusses the main distortion measures used and the estimated rates of assistance and explores the evolution of policies in Mozambique. It concludes with a discussion of prospects for further policy reform.

The Agricultural Sector in Mozambique's Economy

Mozambique's recent history can be divided into four different periods based on the economic and political environments of the time (Wuyts 1978, 1984): a highly regulated and dependent colonial economy before independence; a central planning period following independence in 1975; a high-intensity war period involving economic collapse; and a postwar period characterized by policy reform, large aid flows, and high rates of economic growth after implementation of the peace agreements. These periods can be clearly identified when analyzing agricultural development in Mozambique.

Before independence

During this period, the monetized economy was equally divided into output from plantations, settlers, and peasants. Production was highly specialized across provinces. For instance, Zambezia, a central province, specialized in plantation crops such as tea, copra, and sugarcane. Nampula, in the north, was the center of cashew and cotton production, the two most important peasant cash crops, and it also produced most of Mozambique's sisal and tobacco.

Agriculture was highly regulated. Production of cash crops was structured around geographical concessions, where only specific crops could be cultivated,

and there was a system of forced labor. Prices of production were fixed by negotiation between the colonial government, concession firms, and farmers.¹ Agricultural commerce was carried out by a parastatal marketing board.

1975–1986

Immediately before and continuing after independence, a massive emigration of the settler population and capital flight generated large falls in production and marketed outputs. In 1976 the export value of agricultural crops was 40 percent lower than it had been in 1973. The ruling Front for the Liberation of Mozambique nationalized several firms, but, surprisingly, the emigration of former colonists did not lead to land reform. In fact, instead of distributing freed land to peasants, the government itself took over abandoned land, which laid the foundation for the creation of large state farms in the years to come. State-controlled agricultural operations, mainly organized in large-scale farms, rose to 52 percent of total production by 1982 (Hanlon 1984; Wuyts 1984).

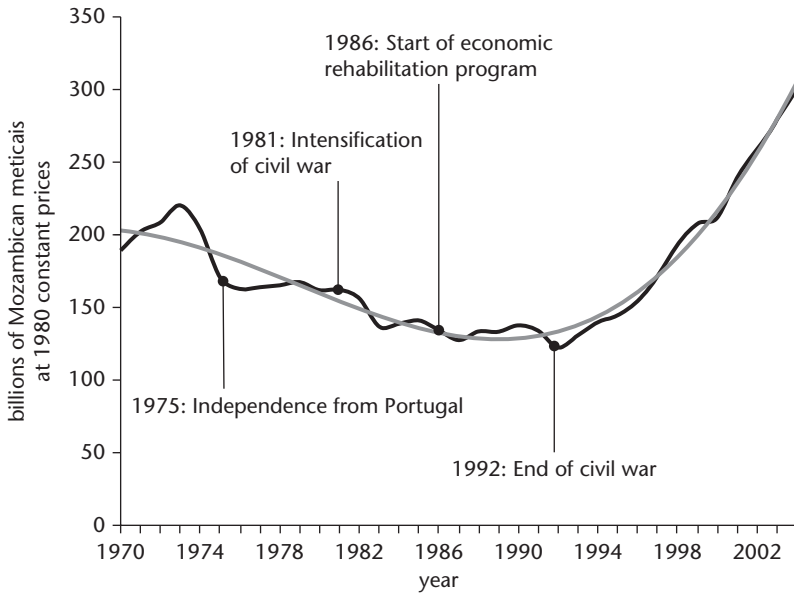
The marginalization of the peasantry and the lack of structured state assistance contributed to a fall in production of both cash and food crops. Large investments to overturn the situation could not be financed from internal savings, and between 1975 and 1982, the monetary value of agricultural output fell by almost 30 percent.²

Agricultural policy during this period therefore can be characterized by an intensification of regulation in what was already a highly regulated sector, a suppression of private initiative, and a policy bias toward larger farms. Prices were fixed at all stages of the supply chain, and producer prices were set low to subsidize consumers. The setting of mandatory producer prices below market-clearing levels encouraged the emergence of parallel black markets from the early 1980s.

1987–1994

In 1987, the Economic Rehabilitation Program began, marking a clean break from past policies. Many fixed prices for agricultural goods were liberalized and others became just indicative prices. Private traders entered the market. This caused a sharp increase in consumer prices in formal markets (by 182 percent in 1987 alone) to align with prices previously registered in parallel markets. State farms and other small and medium parastatal enterprises went through a vast program of privatization, which concluded only at the end of the 1990s.

Despite the destabilizing effects of the ongoing civil war, which isolated farmers from markets, especially in the center-north of the country, production increased for key food and cash crops such as beans, cassava, cotton, groundnuts, and maize.

Figure 4.1. Real GDP, Mozambique, 1970–2004

Source: Arndt, Jones, and Tarp (2006).

1994–today

With the signing of the peace agreement in 1992 and democratic elections in 1994, Mozambique entered into a new phase of high economic growth—an average of 7.8 percent annually from 1993 to 2004 (figure 4.1).³ Agriculture probably benefited more than other sectors from the end of the war, because farmers could get back to their land and because commercialization became easier, even though the destruction of major transport infrastructure contributed to the segmentation of the internal market into three distinct geographic regions: south, center, and north.

On average, real agricultural output grew 6.2 percent annually between 1992 and 2004. This was slightly slower than the economy as a whole, so the importance of the agricultural sector as a share of GDP gradually declined, to 23 percent by 2004, but agriculture still remains the key sector in terms of employment.

Basic food crops include cassava and maize grown mainly by small-holders (69 percent and 63 percent of total production, respectively; TIA 2002). Cassava is the more important of the two and is used mostly for subsistence consumption by producing households, with very little marketed. Other major crops include beans, groundnuts, and rice. Cash crops for small-holders include traditional ones, such as cotton, cashew, and sugarcane, as well as “new” crops such as oilseeds

(sesame, soybean, sunflower), spices (ginger, paprika), and tobacco. The percentage of farmers growing these new crops, although small, increased in the first part of the 1990s, signaling a possible diversification pattern that has been confirmed by more-recent agricultural household surveys (TIA 2002).

With the end of the armed conflict, the relative stabilization of the macroeconomic framework, and large inflows of foreign aid, the country has had a propitious opportunity for the design of a long-term strategy for agricultural development. Unfortunately, Mozambique's agricultural policy is still extremely fragmented and without a clear prioritization of objectives. Remaining interventions seem to be more the heritage of past policies than the result of a new forward-looking strategy.

Policy Interventions in Agriculture

In this section we describe the different policy instruments of intervention used by the government, both general and product specific (for a more extensive overview, see Bias and Donovan 2003).

General policies

Over time, Mozambique has used several types of intervention, from setting fixed prices to imposing strict marketing regulations, production taxes, and trade tariffs.

Fixed and minimum prices

Before independence, the colonial government regulated farmgate prices. These prices were established by a monopsonistic marketing board through which all commercial production had to be sold. This system continued after independence and throughout most of the war period. After independence, the National Commission of Wages and Prices set fixed producer prices, and all production had to be sold at the set price to AGRICOM, a parastatal marketing board, which then took care of distribution.

Prices began to be liberalized in the late 1980s, moving first from fixed to minimum prices, before being fully liberalized. Even though some minimum prices were still present in the late 1990s, from 1996 they were only indicative. Currently, only cotton is regulated, with an established minimum price for producers.

Commercialization

Commercialization of agricultural products was carried out by a state monopsony during the colonial regime. After independence, this same system continued, and the commercialization of all crops, except cotton and cashew, was controlled by AGRICOM, which had a wholesale monopoly and regulated marketing margins.

In the early 1990s, trading in agriculture was liberalized, and private traders started entering agriculture markets. Restrictions regarding product movements across districts and provinces were removed in the early 1990s, as was the colonial system of official geographic monopolies for traders.

Trade taxes

During the colonial period, the agricultural sector was extremely protected, and this high protection remained after independence and during the period of central planning.

Mozambique started applying a most-favored-nation tariff structure in 1989. The country became a signatory of the General Agreement on Tariffs and Trade in 1992 and a founding member of the World Trade Organization in 1995. Since then, import duties have been reduced and simplified. Agricultural products were subject to a 20 percent tariff as of 2006, except for those products considered inputs or basic food products. Maize and rice paid just 2.5 percent and sugar paid 7.5 percent. Tobacco and cottonseeds also paid 2.5 percent. Other products such as beans, cashew, cassava, groundnuts, and tea paid 20 percent. Preferential trade to other members of the Southern Africa Development Community did not start for agricultural products in Mozambique until 2007. One agricultural product, sugar, is also subject to a variable tariff surcharge that depends on the international price of sugar; the surcharge is on top of the normal duty of 7.5 percent.⁴

To supply cheap inputs to the local cashew-processing industry, exports of raw cashew were banned from 1976 to 1992. In early 1992, an export tax, still in place, replaced the ban. The cotton sector has an export tax too, of 2–3 percent, aimed at financing the crop improvement services of the National Cotton Institute (Instituto de Algodão de Mocambique, IAM).⁵

Taxes on and subsidies to production

Production subsidies have not been an instrument of intervention in Mozambique, and there are no records of any direct subsidies to production. The main tax is a value added tax (VAT) of 17 percent, which was introduced in 1998 to replace a consumption tax (5 percent). There are significant exemptions to VAT that affect agricultural products, including a total exemption for seeds. Sugar imports are also exempted from the tax. Nevertheless, the relevance of VAT for domestic production and sales is questionable. The tax is always levied on imports, except for sugar; however, most domestic production and retail sales of farm products do not pay any VAT. As a result, the VAT acts de facto as a 17 percent import duty for agricultural products.

Extension services

Most farmers do not receive any extension services. These are mainly concentrated in a few crops, such as cashew, cotton, maize, and tobacco. In the case of cotton, these services are provided by the concessionary cotton company.⁶

Input policies

Small-scale agriculture in Mozambique typically does not use purchased inputs—less than 10 percent of small-holder producers use any kind of purchased inputs. The main sectors that make use of them are cotton and sugar, which do so through private cotton and sugar concessions. Input markets in Mozambique are more or less nonexistent, and only very recently have some private importers established operations in Mozambique. Two donor-funded programs financed most imports of inputs for agriculture during the 1980s and 1990s: the Mozambique Nordic Agriculture Program during 1977–90; and most important, the Japanese program for Grant Aid for Increase in Food Production (KRRI) during 1987–97. These two programs provided finance for the purchase of machinery, fertilizers, and pesticides. But input interventions are concentrated on very specific crops and producers and have had very little impact on total agricultural production, in part because they are carried out in a fragmented way by nongovernmental organizations (NGOs) and donor-funded programs.

Product-specific interventions

The different products analyzed in this study can be grouped according to their degree of intervention.⁷

One group of food crops, composed of beans, cassava, groundnuts, maize, and rice, has received hardly any government support or intervention. For this group, the main types of government intervention have been fixed and minimum pricing during the 1970s and 1980s, and duties and a value added tax on imports. Maize, rice, and groundnuts (to a lesser degree) had some support from donor-funded programs and NGOs regarding extension services and improved seed varieties; this aid, however, obtained mixed results.

A second set of products includes tea and tobacco, which are export cash crops that have been developed through government-awarded concessions to private firms. Apart from designing and implementing the regulation relative to concessions, since the removal of minimum prices and the privatization of the tea plantations, no substantial government intervention could be identified in either sector.

The last group of products consists of three cash crops subject to heavy intervention: cashew, cotton, and sugar. The sugar sector, since the privatization of the sugar plantations and mills, has been granted high protection and has received

investment incentives such as duty and VAT exemptions for importing capital goods. The cotton sector is structured in a closed geographical concession system where farmers are forced to sell to the concessionary Ginning Company, and in exchange, they receive inputs and extension services on credit.⁸ Exports of raw cashew had been banned until 1992, with fixed domestic producer and factory-gate prices. In 1992, following World Bank suggestions, the sector was liberalized and raw cashew exports were allowed through an export quota and subject to an export tax of 30 percent. In the following years, the quota was removed and the export tax was progressively reduced to 14 percent.

Summary of main interventions

Government interventions in agriculture can be clustered in three different periods. The first period, from 1975 to 1987, involved central planning, where large plantations, commercialization, and processing firms were state owned. During this period, the main instruments of government intervention were fixed and minimum prices designed to subsidize consumer prices.

The second period, from 1987 to 1998, was characterized by progressive price liberalization and privatization. In this period, prices and commercialization were gradually liberalized and a new tax structure started being introduced.

In the current period, which began in 1999, government intervention has been largely restricted to import duties and a VAT, while some specific sectors are more highly controlled: sugar, through an import surcharge; cashew, through an export tax; tobacco, through geographical concessions, and cotton, through minimum prices and closed geographical concessions.⁹

Measuring Agricultural Policy Distortions

The main purpose of this chapter is to measure the level of distortions induced by government policy interventions in the agricultural sector in Mozambique. The focus is on government-imposed distortions that create a gap between domestic prices and what they would be under free market conditions (appendix A and Anderson et al. 2008). Since the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in nonagricultural sectors for comparative evaluation.

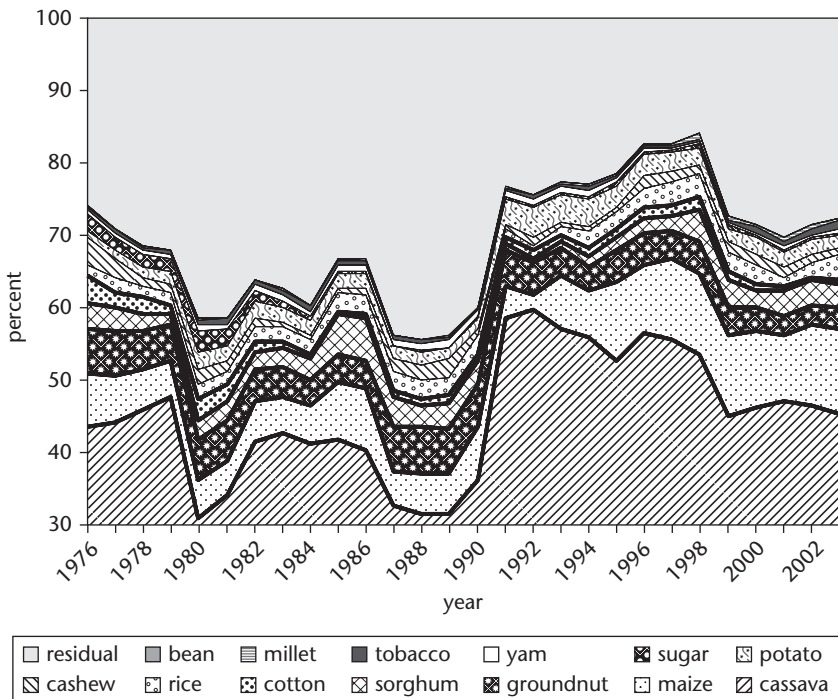
More specifically, this study computes the NRA for farmers, including an adjustment for direct interventions on tradable inputs (such as border protection on fertilizers) and on nontradable inputs (such as credit subsidies to farmers). It

also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA, see appendix A and Anderson et al. 2008).

Products selected

The products selected for the analysis for Mozambique are beans (*nhemba* and butter beans), cashew, cotton, groundnuts, maize, rice, sugar, and tobacco, plus the nontraded staples led by cassava and including millet, potato, sorghum, and yam. The main criterion for selecting these products was their importance for agricultural production in Mozambique—the products covered in the analysis account for about 70 percent of the value of production in primary agriculture (figure 4.2), but data availability also was a constraint. The traded products are the main agricultural products in terms of exports, rural incomes, and focus of government intervention.

Figure 4.2. Shares of the Value of Primary Agricultural Production at Distorted Prices, Covered Products, Mozambique, 1976–2003



Source: Data compiled by authors using FAO price and quantity data.

Cassava is a nontradable and complementary product to maize. It is grown by subsistence farmers, and while a low share of production is marketed, it makes up close to half the value of farm production and is very important in the consumption of food by poor rural households (Tarp et al. 2002). Beans and groundnuts are mainly produced in the center and north and traded in southern markets, where they compete with imports from South Africa. Most maize production also takes place in the center and north, which registers some exports to Malawi, while in the south, Mozambican maize competes with imported maize mainly from South Africa. Rice is not extensively produced in Mozambique, and there is only one rice mill in the south, which competes with Asian imported rice. In the center and north, paddy rice is milled and commercialized in small quantities by small-scale processors.

Cotton and tobacco are export crops organized around concession systems. Sugar is grown in large plantations that control production and milling; only recently have outgrower schemes for small-holder production been introduced. Finally, cashew is mainly a food crop produced by small-scale farmers. Part of the production, however, is commercialized for processing factories or export.

Data issues

The main challenge in estimating any measure of assistance to agriculture in Mozambique is the lack of data. Data are scarce, and sometimes there are significant discrepancies among different sources.

The Agricultural Market Information System (SIMA) within the Ministry of Agriculture began to collect producer, wholesale, and retail prices in 1991 or 1994, depending on the crop. SIMA collects information in all the provinces of the country for several products. In the context of our sample, SIMA covers producer, wholesale, and retail prices for beans (different types), cassava, groundnuts (different types), maize, and rice.¹⁰ In the case of sugar, data are available only since 1998 from the National Institute of Sugar. Cotton and cashew have long historical series of prices from the National Cotton Institute and the National Cashew Institute. Prices for cashew are also reported in McMillan, Horn, and Rodrik (2003).

The main problem for most products, with the exception of cashew and cotton, is the lack of price data for the 1970s and 1980s. However, this period is characterized by regulated prices, and therefore we use government-established fixed and minimum prices based on Tarp (1990) and MINAG (1993). These prices tend to reflect accurate producer and retail prices until the early or mid-1980s. From the mid-1980s to the years of price liberalization, however, black markets became more and more important. As a result, producers and retailers received higher prices, and we may be underestimating domestic prices and overestimating the degree of taxation as expressed by the NRA estimates for this period.¹¹

For cotton, this estimation problem is present during the whole study period. There is evidence that some cotton companies pay prices different from the agreed price to farmers, reflecting production incentives and transport costs. Nevertheless, these price differentials are not very substantial.

For international reference prices we use cost, insurance, and freight (cif) import unit values, if the product is importable, or free on board (fob) export unit values, when exportable. When cif import unit values from the rest of the world are not available, we use South African export unit values and apply a cif adjustment, because most imports in Mozambique come from South Africa anyway.

To make prices comparable, we need to adjust them for margins. In the case of import-competing products, we assume that commercialization margins are equal for imported and domestic products, and we then adjust both prices with transport costs. To do this, we inflate both prices using data on domestic transport costs for maize available from SIMA from 2001 to 2005. We take as the point of comparison the city of Maputo, the largest market in the country. Thus, we compute the average transport costs from all the provinces of the country to Maputo and from the border with South Africa and Swaziland to Maputo, for the period 2001–05. We then add this transport cost coefficient as a percentage of producer price and as a percentage of cif unit values to inflate the prices when we calculate the NRA. We apply this kind of adjustment to beans, groundnuts, and maize.¹² For rice and sugar, we apply transport cost adjustments available specifically for these products (also from SIMA).

In the case of export products, we need to calculate the margin and transport cost adjustment to the border. For cotton it is not required, because cotton lint is exported by cotton processors directly so no intermediary is involved. For cashew, we use the margins for traders suggested in McMillan, Horn, and Rodrik (2003)—50 percent on the producer price and 40 percent on the processor price. For maize, we use the average of transport costs from the center-north region to Malawi as a percentage of price from 2001 and 2005 plus a 30 percent trader margin, as suggested by the Ministry of Industry and Commerce (MIC 2001).

For nontradable staple foods, we take prices and quantities from the database of the Food and Agriculture Organization and assume their NRAs are zero.

The exchange rate was liberalized very gradually in the early 1990s, and some capital controls still remain. Following Anderson et al. (2008), we use a weighted average between the official and the parallel exchange rate, as the equilibrium exchange rate that would prevail in the absence of any distortions.

Results

The NRA five-year average estimates are tabulated in tables 4.1 and 4.2, and shown in figures 4.3 and 4.4. To compute the NRA measures, we use, whenever data are available, a measure based on averages taken during commercialization

Table 4.1. NRAs for Covered Farm Products, Mozambique, 1976–2003

(percent)

Product indicator	1976–79	1980–84	1985–89	1990–94	1995–99	2000–03
NRA, import-competing products ^{a,b}	-67.7	-63.6	-72.2	-5.2	29.5	55.4
Rice	-67.3	-52.0	-75.6	-49.6	7.5	25.8
Maize South	-63.4	-54.9	-66.2	7.6	10.1	19.9
Bean	—	—	—	26.0	43.9	50.6
Groundnut	-67.9	-67.9	-65.4	5.0	18.5	46.3
NRA, exportables ^{a,b}	-70.0	-68.6	-76.4	-25.5	-3.1	-1.0
Maize Center	-55.6	-56.2	-61.8	0.0	0.0	0.0
Maize North	-55.6	-56.2	-61.8	0.0	0.0	0.0
Cashew	-85.6	-90.1	-90.3	-72.9	-13.8	-5.5
Cotton	-64.0	-63.8	-65.0	-1.4	-2.7	-2.4
Tobacco	-64.5	-58.0	-54.8	-31.6	-19.0	0.0
NRA, mixed trade status ^a	-59.8	-65.7	-65.8	18.9	90.5	101.8
Sugar						
NRA, nontradables	0	0	0	0	0	0
Cassava	0	0	0	0	0	0
Millet	0	0	0	0	0	0
Potato	0	0	0	0	0	0
Sorghum	0	0	0	0	0	0
Yam	0	0	0	0	0	0
NRA, total of covered products ^a	-48.5	-41.6	-51.4	-3.9	4.9	7.2
Dispersion of covered products ^c	36.9	33.9	38.1	26.6	30.3	30.1
Percent coverage (at undistorted prices)	70	61	60	73	80	71

Source: Data compiled by the authors.

Note: — = no data are available.

- Weighted averages, with weights based on the unassisted value of production.
- Mixed trade status products included in exportable or import-competing groups depending upon their trade status in the particular year.
- Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

(postharvest) periods, and when data are not available, we use yearly average producer prices.¹³

In the case of import-competing products, the results show a very clear common pattern in NRA values for all products (see figure 4.3), with periods similar to those described earlier. In the first period, NRA coefficients are highly negative from 1976 through 1990, reflecting the government goal of subsidizing

Table 4.2. NRAs in Agriculture Relative to Nonagricultural Industries, Mozambique, 1976–2003

(percent)

Indicator	1976– 79	1980– 84	1985– 89	1990– 94	1995– 99	2000– 03
NRA, covered products	–48.5	–41.6	–51.4	–3.9	4.9	7.2
NRA, noncovered products	0.0	0.0	0.0	0.0	0.0	0.0
NRA, all agricultural products	–42.8	–19.0	–38.3	–5.0	2.2	5.1
Trade bias index ^a	–0.05	0.08	0.38	–0.20	–0.25	–0.36
NRA, all agricultural tradables	–70.1	–67.3	–75.1	–15.4	16.3	26.0
NRA, all nonagricultural tradables	28.0	28.0	28.0	28.0	28.2	23.1
RRA ^b	–76.7	–74.4	–80.6	–33.9	–9.4	2.4
Memo item, ignoring exchange rate distortions:						
NRA, all agricultural products	–24.3	–12.7	–36.3	–3.6	2.2	5.1
RRA ^b	–60.1	–66.4	–75.8	–33.1	–9.4	2.3

Source: Data compiled by the authors.

- a. Trade bias index is $TBI = (1 + NRA_{agx}/100)/(1 + NRA_{agm}/100) - 1$, where NRA_{agm} and NRA_{agx} are the average percentage NRAs for the exportable and import-competing parts of the agricultural sector.
- b. The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

consumer prices through low fixed producer prices and fixed margins. These negative NRA values continue until the early 1990s, but we are overestimating the degree of taxation expressed by the NRA by the end of this period: the lack of market producer prices required us to use government-established minimum prices, which are likely to be below actual prices received by producers.

In the second period, from 1991 through 1997, price liberalization is captured in our estimations by the shift from using minimum prices to collected producer prices from SIMA. For the reasons underlined earlier, it is likely that the rise in the NRA that we record as having begun in 1990 actually began a couple of years earlier. During this period, domestic prices rose in order to achieve market-clearing conditions. Furthermore, NRA coefficients started to become positive as a result of the introduction of taxes on imports and exports.

The third period shows a peak for the NRA in 1998 and fluctuates around positive values that mainly reflect import duties. Note that volatility increases in this period. Such an increase, when using observed producer prices, is consistent with the experiences of other countries in the Africa region.

NRAs seem to oscillate during the period 1995–2000 around the value of the import tariff, plus the VAT in some cases.¹⁴ Nevertheless, the average NRA

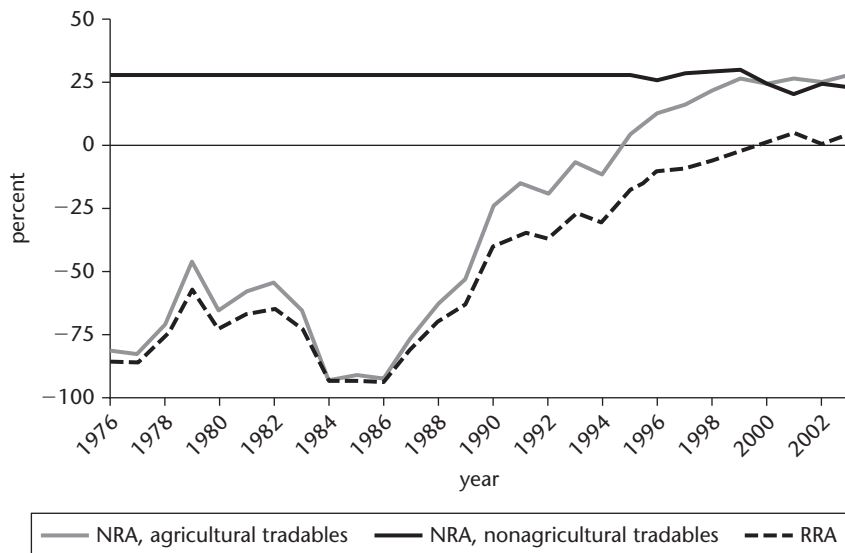
Figure 4.3. NRAs for Exportable, Import-Competing, and All Covered Farm Products, Mozambique, 1976–2003



Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

Figure 4.4. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Mozambique, 1976–2003



Source: Data compiled by the authors.

Note: For definition of the RRA, see table 4.2, note b.

estimates for 2001–03 decrease significantly. The lack of government intervention in the sector implies that the actual NRA values should theoretically converge to import tariffs and VAT rates. Thus, the differences observed may well correspond to measurement errors.

The case of exportable goods seems to be slightly different from import-competing products. Despite the shift from a negative NRA toward zero with the process of price liberalization, the trend after the 1990s is different across products. In the case of exportable maize in central and northern regions, the absence of intervention causes the trend to converge to the expected zero NRA, while for cotton lint, the trend converges to the export tax. For cashew and tobacco, NRA estimates remain negative longer.

Evolution of NRAs by product

The NRAs for each product evolved somewhat differently, reflecting policy interventions specific to each market.

Maize

Maize is imported in the southern region and exported from the center and north of the country. High transport costs make trading maize from north to south unprofitable, and maize surplus is therefore exported to Malawi, while the deficit in the south is largely covered by maize from South Africa. For this reason, we compute the NRA for maize at these regional levels.

In the south, the NRA follows the trend described in the previous section for import-competing products. In the first period, the NRA is negative because of fixed and minimum pricing with the objective of subsidizing consumer prices in urban areas. In the second phase, prices are liberalized and the NRA becomes positive, tending to converge to the import tariff. In the final period, the NRA is characterized by high volatility. However, in the absence of other policy interventions, the actual NRA should lie around the import tariff plus the VAT rate.

In the center and north, where maize is exportable, the picture is quite different. Our estimates, accounting for fixed transport costs and trading margins of about 41 percent, indicate a negative NRA during most of the period before 1990 of between –55 and –60 percent. For the period since then, we assume a zero NRA in the absence of government intervention after price liberalization.

Beans

Two main types of beans are produced in Mozambique, *nhemba* and butter. Beans are mainly produced in the center and north of the country, and the quantities commercialized are mainly consumed in the south. The fact that *nhemba* beans

are a domestic variety simplifies the calculations. There are no possible reference prices for this type of bean, since it is produced only in Mozambique, and therefore, in the absence of intervention, the NRA can be assumed to be zero. Butter beans, however, compete with beans imported from South Africa. For the period for which we have data, the NRA following price liberalization is close to the tariff and VAT rate of 46 percent.

Rice

Rice in Mozambique is mainly produced by small-scale farmers. More than 75 percent of production is concentrated in the center and north of the country. Rice produced in the south is milled in the only existing industrial mill in the country, while the rice produced in the center and north is milled directly by farmers and then sold. In this case, producer and processor prices coincide. The trend of the NRA for this product is similar to the rest of import-competing crops—highly negative in the early period and then shifting toward positive rates similar to the import tariff plus VAT.

Tobacco

Tobacco is an export crop organized in a system of geographical concessions, first state-owned and then private. The NRA was more than -50 percent before liberalization and thereafter converged to zero.

Cotton

Cotton is very important in rural areas and is highly regulated. Table 4.2 shows a highly negative NRA for cotton producers, but it has a highly positive trend following the privatization of the ginning sector, when ginners were allowed to export directly to the international market. The lack of quality adjustment may explain some of the price differential, but the result seems to be consistent with the findings by Boughton et al. (2003) of low quality and also very low producer prices in Mozambique compared with other African countries.

Cashew

The cashew sector has been the subject of intense debate in the last two decades. This is one of the main crops in the northern provinces, and the processing industry was traditionally one of the main sources of industrial employment. After the reform many of the processing unions were forced to close down, unable to compete with prices offered by traders that export raw cashew for processing in India.

These reforms can be easily identified in the NRA evolution. For cashew producers after independence and with the export ban, NRAs are negative and very high, indicating a large tax on producers to subsidize the processing industry with

cheap raw cashews. After the replacement of the export ban with an export tax, the NRA became less negative. The gap between the producer price and the border price, once controlled for the traders' margin, narrowed considerably over the 1990s, and the NRA tended to converge on average to the export tax.

Sugar

Sugar is a very important focus of government support in terms of agroindustrial policy. The structure of the sector, where processors control production, implies that the relevant support measure for sugar is the processor NRA.¹⁵ This product is considered to have been exportable from 1975 to 1982 and importable afterward.¹⁶ During the 1970s the sector was nationalized, and it operated with state-owned plantations that were privatized in the 1990s. This is reflected by a negative NRA during the period until prices were liberalized and farms privatized. Then import tariffs became the main influence on the NRA.

Aggregate NRAs and the RRA

The NRAs for covered agricultural products as a whole move from about –50 percent before 1990 to an average of zero in the 1990s and to just above zero in the current decade. If we assume noncovered products are not distorted (because many of them are nontraded horticultural and livestock products), the overall NRAs for the farm sector are somewhat closer to zero. The NRA for tradable farm products alone, however, is very negative before the 1990s' liberalization. When that NRA is compared with the positive NRA for tradable nonagricultural products, the relative rate of assistance is highly negative until the reforms begin to make their mark in the 1990s; it then converges to zero and even becomes slightly positive after 2000 (see table 4.2 and figure 4.3).

The final set of rows in table 4.2 shows what the distortion indicators would have been had the distortions to exchange rates not been taken into account. These calculations suggest that less than one-eighth of the RRA in the 1980s was attributable just to exchange rate distortions, and that influence has since disappeared.

Conclusions and Prospects for Further Policy Reform

The agricultural sector in Mozambique has undergone a process of progressive liberalization and elimination of government intervention. The country shifted from central planning, concession systems, and the use of fixed and minimum pricing during the 10 years after independence toward a market economy. Since the early 1990s, when those economic reforms began, government intervention

has been minimal and based mainly on the use of import tariffs, with the exception of cotton, cashew, and sugar where more complex policies have been implemented. Sugar now has a large positive NRA based on a very high import surcharge. While this situation is not unlike many other countries, the government nonetheless could explore other, less distortionary forms of assistance.

Notes

1. The colonial government set producer and consumer prices as well as marketing margins at all stages of production (Tarp 1990). These were negotiated with settlers' farm associations. Prices varied according to province of origin and quality.

2. Data in this section are drawn from a National Planning Commission report of 1994, cited in Tarp and Lau (1996).

3. The average real growth rate during this period, excluding large project investments in natural resources and aluminum, was 6.5 percent; the poverty headcount index moved from 69 percent in 1996/67 to 54 percent in 2002/03, and agricultural incomes increased on average about 27 percent in the same period (Arndt, Jones, and Tarp 2006).

4. In 2004, for instance, this surcharge was close to 60 percent, although in 2006, when international prices were higher, the surcharge was zero and only the standard duty applied.

5. The export tax is intended to finance extension services, crop research, pest control, and other activities, but the IAM's provision of such services has been quite minimal because of the lack of human and financial resources.

6. Some analysts suggest that these services tend to be of poor quality (see, for example, Wandschneider and Garrido-Mirapeix 1999). Boughton et al. (2003), and Walker et al. (2004) found these services had a very limited impact on agricultural production and rural incomes. Some NGOs, such as World Vision and CARE, and some donor agencies, offer some extension services under specific programs for cashews, cotton, maize, and tobacco in northern Mozambique.

7. The main product-specific interventions, and lists of the official interventions recorded in the official government (Boletim da República), are described in the appendix to Alfieri, Arndt, and Cirera (2007).

8. The geographical concession system was opened in the late 1990s, but some ginning companies soon experienced financial difficulties and the reforms were abandoned.

9. In 1999, a donor-funded sectorwide program for agriculture (PROAGRI) of about US\$200 million was introduced. Although it included support measures to extension and marketing, the program has been criticized for not having a significant impact on agriculture. The main objectives of PROAGRI are to improve the productive capacity and productivity of agriculture, the family sector, and the private sector using labor-intensive technologies and sustainable management of natural resources; to guarantee access to land and reduce associated bureaucracy; to promote and facilitate the marketing of agricultural and livestock products, and also the access to markets (for factors of production as well as credit); and to reduce the vulnerability of households facing chronic food insecurity (Bias and Donovan 2003).

10. SIMA price data are collected in at least two or three markets for each province. Average prices thus appear to be representative in geographical coverage, although they have not been weighted with provincial consumption shares.

11. In addition, some observations are missing for some products in the early 1990s.

12. Three issues have to be taken into account when doing this. First, not all production is sold in Maputo; a significant amount is commercialized in central and northern provincial markets. Second, transport costs for maize do not necessarily reflect costs of transport for other products. Third, we assume a constant transport cost ratio between border-Maputo and rest-of-the-country-Maputo

through time. Nevertheless, and despite these strong assumptions, what is relevant when using this approach is the accuracy of the ratio between the two price-adjustment coefficients. This ratio should also approximate the ratio of transporting another product from a remote farm to a central provincial market relative to the transport costs from the nearest port to the same market.

13. For most products, higher producer prices experienced during the off season mean that NRA values are higher when yearly averages are calculated. This may be misleading because in the absence of storage infrastructure, prices that most producers receive are likely to be the prices recorded during postharvest periods.

14. The value added tax is not paid along the value chain of agricultural products, from the farm to the market, because small businesses are not required to charge the tax. Nevertheless, unless the product is exempted, VAT is always paid at the border and therefore acts de facto as an import tariff.

15. For the NRA aggregation, we assume full pass-through of the distortion to sugarcane farmers.

16. With the rehabilitation program in the 1990s and the protection granted to the domestic market, production has increased but is oriented toward the (relatively profitable) national market, where Mozambique's sugar competes mainly with sugar from South Africa or Swaziland. Exports are growing but are limited to the quota-limited preferential access to markets in the European Union and the United States.

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SOUTH AFRICA

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The Union of South Africa was formed in 1910 by combining two British colonies (the Cape and Natal) with the defeated Boer republics (Transvaal and the Orange Free State). In the ensuing years, the South African Parliament set about consolidating legislation from the four component territories and introducing new legislation (Vink and van Zyl 1998). In agriculture, for example, a Land Bank was established under its own legislation in 1912, made up of elements of similar institutions that had existed in the four territories. Just a year later the first of the notorious land acts was promulgated, not only to proscribe land ownership by blacks but also to outlaw labor tenancy and sharecropping. These laws set the scene for an approach to agricultural policy that was to dominate the sector for at least the next seven decades, namely, increasing support to white commercial farmers and decreasing opportunities for black farmers.¹ The structural dualism that resulted still exists today after more than a decade of democracy.

Between 1910 and 1935, 87 acts were passed that allowed the government to assist farmers (Minnaar 1990). For example in 1912, the year the Land Bank was established, the Land Settlement Act was also promulgated. Its purpose was to regulate the settlement of white farmers on state-owned land and to enable the state to purchase further land for such settlement (Grobler 1988), a process that was to last until after World War II. This legislation was followed in 1922 by the Cooperative Societies Act, aimed at securing input supply and marketing services for farmers through legislation that favored cooperatives by limiting their tax liability and introducing the concept of “forced cooperation” to enable them to manage free riding. It is estimated that

* The authors are grateful for helpful comments from workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Kirsten, Edwards, and Vink (2007).

the government spent £112 million on agriculture between 1910 and 1936, and a further £11 million on export subsidies between 1931 and 1937 (De Kiewiet 1942).

The year 1937 saw the advent of a marketing law, under which more than 70 percent of total agricultural output was controlled until 1996, when the new Marketing of Agricultural Products Act was promulgated by the democratic government. The Marketing Act of 1937, amended in 1968, sanctioned different types of marketing schemes for different agricultural commodities. The powers available under these plans included monopoly buying, single channel exports, control over agroprocessing, and quantitative controls over imports. Of the commodities included in the current study, only poultry meat escaped this form of control, while the sugar industry was regulated under separate legislation.

The main impetus for this agricultural policy was aptly summarized in a white paper published by the government (Union of South Africa 1946):

Farming has been our traditional occupation and it still sustains three-fifths of the population. The industry is therefore of great economic importance. It is of similar importance nutritionally. Great distances separate us from the food exporting regions of the world. . . . A large and healthy farming industry is a key factor in national security. In these circumstances the people of the Union have a vital interest in the farming industry—in its efficiency and prosperity. . . . [T]he farming industry is in large part unable to stand up to overseas competition, the real test of efficiency in normal market conditions. The production of wheat, sugar, maize, dairy, wine, [and] tobacco has expanded chiefly under the stimulus of heavy protection. Even so in bad seasons total production falls short of the effective demand. Nor does the industry in its present state provide reasonable living conditions for the bulk of farmers and farmworkers. . . .

After 1955, the story of agricultural policy toward commercial farmers involved widespread support, regulation, and control in a climate of increasing isolation from the rest of the world, especially in the 1980s, followed by rapid deregulation and trade liberalization during the course of the 1990s with the advent of democratization and implementation of the terms of the Marrakech Agreement that brought agriculture into the World Trade Organization. It is this period since 1955 that is the focus of the rest of this chapter.

Economic Performance of South African Agriculture since 1955

The growth performance of South African agriculture is characterized by distinct periods that correspond to the policy periods described in the next section. During the 1950s and 1960s, as the South African government invested in

agricultural research, extension services, rural infrastructure, and settlement of farmers, agricultural output gradually started to grow. Guaranteed markets and guaranteed prices for most farm commodities assisted the growth in the sector. The 1970s was also a period of rapid growth in the economy, assisted by high gold prices and high agricultural growth, but the oil crisis in the mid-1970s negatively affected economic growth in the late 1970s and early 1980s. Direct government transfers to farmers plus highly supported farm prices stimulated agricultural growth in the late 1980s, pushing it up to the level of the early 1970s. A massive drought in the early 1990s, market liberalization, and the instability before and immediately after the 1994 elections all negatively affected growth opportunities in the sector. Agricultural growth has increased marginally since the end of apartheid, but only after confidence in the democratic change was restored, and then only with a weakening exchange rate and thus higher commodity prices and export earnings.

Relative to the rest of the economy, however, the share of agriculture, forestry, and fisheries in the country's gross domestic product (GDP) has declined steadily since 1955 to its current level of less than 4 percent. The mining sector has also experienced a decline in its relative share of GDP, but so has manufacturing. Services account for a steadily increasing share of GDP, as the South African economy has reached a relatively advanced stage of maturity.

Within agriculture, there has been a shift in the relative shares of livestock, field crop, and horticultural production. The livestock sector has maintained an overall share of about 45 percent of total agricultural output, moving between 35 and 50 percent with the typical livestock cycle (Department of Agriculture 2006). However, the composition of livestock production has changed considerably. Beef and veal production increased from 450,000 tons to 700,000 tons between 1970 and 2005, but cattle's share of total meat production nevertheless declined from 52 percent to 39 percent over this period. Likewise, pork production has increased, but its share of the total has declined from 9 percent to 7 percent, while sheep and goat meat has declined in absolute terms (from 214,000 tons to 112,000 tons) and relatively (from 25 percent to 6 percent). The big shift has been to poultry meat, with production increasing from 121,000 tons to 862,000 tons and its share increasing from 14 percent to 48 percent of the total.

The composition of field crop production has not changed much over the past three decades: sugarcane and maize made up 59 percent of the value of production in 1970, and maintained that share in 2005. Production of some specialty cash crops such as cowpeas, lentils, and chicory root has virtually come to a halt, while cotton production has also declined considerably.

Within the horticultural sector, fruit has increased its share of physical production from 55 percent to 60 percent, while within that sector, the share of deciduous fruit declined by 6 percentage points (from 60 percent to 54 percent of

the total between 1976 and 2004) while the share of citrus increased to 31 percent. Subtropical fruit, berries, and summer fruit maintained their relative shares of total output.

Exports of primary agricultural products and food products have also grown rapidly, although their share of total merchandise exports declined from approximately 18 percent in 1975 to around 7 percent in 2004, as would be expected during the process of development of the economy. Exports of processed agricultural products have increased faster than exports of unprocessed agricultural products: the share of processed goods in total agricultural exports has increased from around half to around 60 percent.

Agricultural imports have also risen and at a faster rate than other imports or agricultural exports. Agricultural imports have more than doubled their share of total imports into the country over the past two decades, from 2.6 percent to 5.4 percent. During this period, imports increased from 6.2 percent of total agricultural output to more than a fifth (22.6 percent) of output. As a result, import cover (the ratio of agricultural exports to agricultural imports, a measure of the ability of the agricultural sector to pay for its own imports) has declined drastically from 5.6 to 1 to 1.35 to 1. The main reason for the rapid increase in imports is the emergence of animal feeds, especially poultry feed, as South Africa's main agricultural import item. Along with this has been the emergence of Argentina as the single largest source of agricultural imports.

The export composition and export orientation of agriculture has also shifted over this period. South Africa is generally a net importer of meat and is an exporter of field crops in some years. Maize exports have remained relatively stable, but as production has risen, the share of maize output that is exported has declined from 30–40 percent of the total harvest in the 1970s and 1980s to 10–20 percent over the first five years of the current decade. In the case of horticulture, there has been a considerable shift in export orientation: the share of production exported has increased from around 24 percent to 32 percent over the past three decades. Within deciduous fruit, exports have shifted away from apples toward apricots, table grapes, pears, peaches, and plums, while within citrus the relative shift has been away from grapefruit and lemons toward oranges. The only subtropical fruit that South Africa has traditionally exported is avocados, and the proportion of the total crop that is exported has increased from some 40 percent in the early 1980s to just over 60 percent.

Nevertheless, the country's export portfolio has not changed much for more than a century. Traditionally, wine, fruit, sugar, maize, wool, and hides and skins were exported, mainly to the United Kingdom and other parts of Europe. These items made up 72 percent of total agricultural exports on average between 2002 and 2004 (up from around 45 percent in 1972), while the European Union

remains the largest export destination, taking more than 40 percent of exports. South Africa's second largest agricultural export market is to other countries within the South African Development Community, accounting for almost 20 percent of total agricultural exports.

Total farm employment increased until the early 1970s, after which it started a long decline. In 1955, agricultural employment still represented more than 25 percent of total formal sector employment in the country (Vink and Kirsten 1999), but it was less than 10 percent at the time of the last census in 2002. However, these data hide the relative shares of permanent and seasonal labor. The trend toward horticultural production is expected to result in a swing to more seasonal workers, because harvesting in this sector is still largely done by hand.

Agricultural Policy

State support to commercial farmers increased until around 1980, with the deployment of a host of legal and other policy instruments that affected the prices of and access to natural resources, finance, capital inputs, and labor, as well as access to local and foreign markets.

Policies to 1980

The main features of the commercial agricultural sector after World War II were the mechanization of commercial farming, the consolidation of marketing plans, and increased pressure on food production in the homelands. Regarding mechanization, the experience in the maize farming areas tells the story of capital and labor substitution in agriculture (De Klerk 1983).

The total number of farm employees in South African agriculture grew until 1970. Although this trend corresponded with increased mechanization following the large-scale introduction of tractors, an increase in the area planted led to increased demand for labor to harvest the bigger crop. Employment then fell between 1970 and 1980, although farm employment was still higher in 1980 than it had been in 1950. The turning point around 1970 coincides with the introduction in the late 1960s of combine harvesters, stimulated by preferential tax treatment. De Klerk (1983) shows that the share of the maize crop that was harvested with combine harvesters grew from 16 percent in 1968 to 81 percent by 1977. This period simultaneously saw the highest rates of forced removal of permanent labor from farms and an increasing use of temporary or seasonal labor, most of whom were women and children (Marcus 1989).

Other features of the commercial farm sector in the postwar period include the tightening of control over prices and over the movement of produce under terms of the Marketing Act, and an increase in subsidies to white farmers. The subsidies

came partly from direct budgetary transfers for disaster relief, irrigation infrastructure, water subsidies, research, and the like and partly through price policy and interest rate subsidies.

South Africa used a full range of policy instruments to support commercial farmers, including not only direct subsidies but also many regulatory instruments aimed at health, safety, and the protection of natural agricultural resources. Yet the most important instrument used was marketing intervention, mainly through the Marketing Act. This enabling legislation set out the conditions under which farmers or the minister of agriculture could set up a marketing plan that would be administered by a control board. The powers of the board were selected from among those allowed under the act, and farmers were guaranteed a majority of the seats on the board. By the 1970s, more than 20 boards were in operation, covering some 80 percent of total agricultural production.

The maize, red meat, and deciduous fruit export schemes are discussed below to illustrate the working of the specific control measures pertaining to each, as well as the economic consequences of these schemes.²

The maize scheme

Until the late 19th century, sorghum was the most prevalent starchy staple consumed in southern Africa. However, white maize superseded sorghum as traditional economies became monetized, largely because maize production and preparation placed fewer demands on available household time (Low 1986). The result is that the demand for maize in southern Africa differs from that in the rest of the world because of the relatively large human consumption of white maize. That also made it easier for South Africa's Maize Board to justify a control regime that precluded imports as far as possible, in the name of food self-sufficiency.

Maize marketing was controlled under a single-channel, fixed-price regime. The Maize Board was the sole buyer and seller of maize at a price fixed annually by the Parliament's cabinet. Annual surveys of average production costs by the Department of Agriculture were used as the basis for the price. Farmers' selling price to the Maize Board was set at average production cost plus a profit margin, while the board's selling price to millers was its buying price plus a margin that covered handling, storage, and transport. The board appointed agents to purchase maize from farmers on its behalf and to store and distribute the produce to millers. The board usually appointed a cooperative to act as its agent, with the result that the cooperatives gained regional monopoly powers.

The buying and selling prices of maize were panterritorial and panseasonal, fixed regardless of when and where maize was delivered. The board also controlled imports and exports. A stabilization fund was set up to defray expenses in

times when surpluses had to be exported at a lower world price and to deposit profits in times of shortage when the board could import at a lower world price. In practice, the board set buying and selling prices in such a way that the stabilization fund was perpetually in arrears. During the late 1970s and the 1980s, the board exported some maize every year, and the weighted average of maize domestic prices remained above the export realization price. The panterritorial pricing regime meant that transport costs of those farmers who delivered maize from distant areas were subsidized by farmers closer to the market. The transport system was expected to transport raw commodities rather than processed foods, thereby increasing the cost structure of the system as a whole. Millers paid the same price regardless of the location of their plant. Over time, therefore, the agribusiness sector gravitated toward the main urban areas, thereby depriving the rural areas of an important source of economic activity. Panseasonal pricing had a similar effect on storage, preventing the emergence of private sector stockholding.

The red meat marketing scheme

The per capita consumption of beef and veal in South Africa decreased from 36 kilograms in fiscal 1948/49 to 22 kilograms in fiscal 1980/81, while that of poultry increased from 2.2 kilograms to 12 kilograms over the same period (Nieuwoudt 1985). Thus, any policy intervention that resulted in an artificial increase in the price of red meat would favor the poultry industry. The red meat marketing plan did precisely that: by restricting sales of red meat, it contributed to the rise in popularity of its greatest competitor.

Formally, the red meat scheme was classified as a “surplus removal scheme,” because the main instrument used was a minimum price set by the Meat Board to stabilize the price by removing short-term surpluses and adding supply to the market in times of shortages. Again, the board frequently could not resist the temptation to set the minimum price above the market-clearing level, with the result that additional intervention was required to manage the resultant oversupply on the market. To this end, the board divided the country into controlled and noncontrolled areas, where the former covered the areas of greatest demand, that is, the main metropolitan markets. At the same time, the requirements for the erection of abattoirs were tightened, with the result that most of the smaller facilities in the country were closed down. Permits or quotas were required of any producer who wished to sell red meat into the controlled market.

The economic consequences of the scheme are clear. Because large producers (mostly feedlots) were more likely to gain access to quotas or permits, they were able to capture the economic rents arising from the difference in price in the controlled and uncontrolled areas by buying stock in the countryside and selling it in the towns and cities. Thus, the largest effect of the intervention lies in the redistribution of

wealth toward larger producers (and speculators) and away from smaller producers. Since larger producers were more likely to have their interests represented on the board, these economic consequences become something of a self-fulfilling prophecy. Transportation rules were not fully enforced, however, and unrecorded, informal sales of red meat into the poorer urban areas had become almost the norm rather than the exception by the 1980s (Karaan and Myburgh 1993).

The deciduous fruit scheme

South African fruit exports started in the early 1890s, and annual apple exports had reached 170,000 tons by 1975, compared with 50,000 tons from a country such as Chile. However, Chilean apple exports grew by some 800 percent from 1975 to 1995, compared with the approximately 66 percent growth in South African exports.

One of the main differences in the marketing regime between South Africa and Chile was the extent of state intervention in South Africa. There, deciduous fruit and citrus were marketed under a single-channel pool scheme, where the respective boards or their agents were the sole buyers of fruit for the export market and therefore the sole sellers in the export market. The produce of farmers was pooled, and the proceeds divided on the basis of the quantity delivered to the pool. As a result, farmers who delivered produce that was below average in quality were favored, while those that delivered high-quality fruit were penalized.

These monopolistic arrangements probably inhibited growth in the volume of exports in any number of ways.

- The South African deciduous fruit industry traditionally focused on selling only the best quality under the “Cape” trademark, with the result that price premiums of up to 30 percent were regularly achieved. However, this quality came at the expense of volume.
- South African exporters had to finance the facilities required to move their produce from the farm to the respective boards themselves. The considerable investment in packing houses, combined with relatively high interest rates, limited the amount of investment funds available for the expansion of production.
- South Africa was relatively unsuccessful at exploiting new markets, with only a small proportion of exports going to nontraditional markets such as in Asia and the Middle East, compared with Chile, which sold about a third of its export crop in these markets. Again, it could be argued that a monopoly exporter would not be sufficiently flexible to be able to exploit such niche markets.
- A further result of the concentration of exports to a few traditional markets, and South Africa’s isolation from the world market, was the relative lack of effort given to the development of new cultivars in the period before 1990.

Hence the country's fruit growers have since been at a competitive disadvantage with respect to changing tastes abroad.

A broadening of the policy focus

Four events between 1973 and 1976 created a security crisis in South Africa (Vink and Schirmer 2002). These included labor unrest and "unlawful" strikes by black trade unions in the Durban region in 1973; the OPEC (Organization of Petroleum Exporting Countries) oil crisis of 1973; the coup d'état in Lisbon in April 1974 that led to the abortive invasion of Angola by South Africa in 1975; and the Soweto unrest of June 1976. Despite attempts by the ruling elite to maintain the existing order, it lasted for fewer than 20 years after these events and was doomed to failure. By 1976, the economy had moved into recession, which turned into a period of prolonged stagflation that lasted until 1994. Terreblanche (1998) shows that over time the ruling National Party shifted from an exclusive focus on the interests of Afrikaners to a broader focus on the interests of whites. Vink (1993) summarized the impact of agricultural policy in the period leading up to 1980 as follows:

This combination of segregation of land ownership and a two-track approach to access to support services had a number of major effects on the farming sector. First, it resulted in extraordinary institutional duplication with attendant high fiscal cost. . . South Africa ended up with 11 Departments of Agriculture by 1980 (14 by 1984). . . Second, it created "two agricultures" . . . which differed in access to land and support services, productivity, etc. . . Third, it created the anomaly of a country that regularly exported food "surpluses" while most of the population lived well below minimum levels of living. In addition, the food self-sufficiency index showed exports of field crops and imports of red meat while the country has a poor arable resource base. . . . Fourth, for much of this period farm input prices were rising faster than product prices despite attempts to keep domestic prices above parity with imports. Fifth, there was much evidence of severe environmental damage to fragile land resources in both the commercial farming areas and the homelands. . . . Sixth, the combination of subsidies and distortionary price policies led to high rates of growth in farmland prices. By the beginning of the 1980s the farm sector had become inflexible and it has been argued that these farm policies made the sector particularly vulnerable to the disastrous drought that struck the subcontinent in the early 1980s. . . . Seventh, the processes of forced removals and homeland consolidation created a high level of uncertainty among individual farmers, both black and white, as to the protection of existing property rights, with predictable economic consequences in some of the ecologically most vulnerable parts of the country.

Policies during the 1980s

Financing and assistance formed one of the three pillars for the Ministry of Agriculture's policy of "optimum agricultural development," as defined in a 1984 white paper (RSA 1984). The other two pillars on which this policy was based were optimum agricultural resource use and orderly marketing and price stabilization. Agricultural financing was considered an important third pillar in view of the risks inherent to agriculture in South Africa's relatively unsuitable climate. This, according to the government of the day, necessitated special financing facilities to create confidence in the industry and to give it needed stability.

Agricultural financing programs were provided through the Land Bank, commercial banks, other private financiers including the agricultural co-operatives, and finally the funds supplied under the Agricultural Credit Act of 1966. Funds were made available under this act to help poorer farmers acquire land and to provide production loans. These programs are summarized in Kirsten, Edwards, and Vink (2007, appendix table 3).

During this period, marketing policy started to shift quite radically, although within the framework of the Marketing Act and the control boards that constituted its institutional infrastructure. Vink (1993) argues that these changes came about as a result of macroeconomic pressures. South Africa's macroeconomic policy changed in the late 1970s and early 1980s from a focus on nonmarket controls over monetary policy toward market-oriented controls (Strydom 2002). Monetary policy reforms were led by the submission of the report of the De Kock Commission (1985), which, through its interim reports, had already stimulated a shift away from interest rate controls, liquid asset requirements, and cash reserve requirements as the main instruments of monetary policy.

The example of the Land Bank is relevant here, because it was allowed to sell scrip of up to three years' duration under the definition of "liquid assets," enabling the Land Bank to pass on these lower borrowing costs to its clients, the commercial farmers, without requiring a direct subsidy from the taxpayer.

Financial sector liberalization preceded the deregulation of the real sector of the economy. One of the results was to stimulate exports by allowing the free floating exchange rate to depreciate while import substitution policies were still in place in the manufacturing sector. Fiscal policy was no more successful. Its main feature was the rising cost of maintaining the apartheid system (Strydom 2002), which was reflected in an increase in current expenditure as a proportion of GDP, the growing cost of homeland governments, increased spending on security (military and police), and a high tax burden. One important consequence was that the budget deficit reached a peak of 7.3 percent of GDP in 1993 (Strydom 2002), necessitating high real interest rates.

The most immediate effect on agriculture came from changes in the external value of the currency and in the interest cost of farm borrowing. As the South African rand started a decade-long decline in value, farm input prices, which have a relatively large import component, rose faster than farm output prices. At the same time, interest rapidly became the single largest cost of production in agriculture. During this period, many of the existing controls over the movement of labor in South Africa were also lifted, setting in motion a vast population movement from the farms and the homelands to the towns and cities (Urban Foundation 1991). This was accompanied by migration of people from most parts of Southern Africa to the rural and urban areas of South Africa (see Simkins 1993, for example). Finally, considerable microeconomic deregulation took place, also starting in the late 1970s and early 1980s, leading to a significant increase in activity in the informal economy (Kirsten 1988; May and Schacter 1991; Moll 1993). One of the most visible effects was the increase in informal marketing of farm products in the urban areas (Karaan and Myburgh 1993).

Beginning in the 1980s, the agricultural authorities undertook a process of deregulation and policy change in the farm sector.³ The most prominent examples include the following:

- Deregulation of marketing by loosening the terms of the Marketing Act and other legislation. This included the elimination of restrictive registration of processors in the red meat industry, the abolition of most controls on domestic marketing of deciduous and citrus fruit, the abolition of production quotas in the wine industry, deregulation of single channels for sorghum and leaf tobacco; and eventual deregulation of the mohair and maize schemes as well as abolition of control schemes in the banana, wool, egg, and chicory industries. The report of the Kassier Committee (1992) can be regarded as a milestone in this process.
- Liberalization of price controls in large parts of the farm sector, again mainly by relaxing the terms of the Marketing Act. Price setting in the grain industries was changed from a cost-plus basis to market-based systems (Brand Report 1988), leading to substantial declines in real farm output prices. The most important liberalization was the restriction on the ability of control boards to carry losses and profits on stabilization funds into a following year. Additional examples include the eventual abolition of price controls on dairy products and later on flour, meal, and bread; and the termination of consumer price subsidies on maize meal and bread.
- A change in tax treatment of agriculture, which, among other things, reduced the implicit subsidy represented by income tax concessions to farmers, which in 1981–84 amounted to 70 percent of their theoretical tax bill (Lamont 1990). Changes in tax policy also resulted in an extension, from one to three years, of

the period over which capital purchases could be written off; restrictions were also placed on the extent to which farming could be used as a tax shelter for other income sources.

- A change in direct budgetary expenditure on agriculture, including a proportionate increase in budgetary transfers to the Departments of Agriculture in the homelands and a proportionate decrease to commercial agriculture (Vink and Kassier 1991). In addition, real spending on commercial farming was reduced during the 1980s (Brand et al. 1992).
- Scrapping, in 1991, of the Land Acts and related legislation that enforced the racially based segregation of access to land. This was the most visible of the policy changes in agriculture following the breaking of the political logjam in February 1990.
- Tariffication of farm commodities, mainly because of the pressures arising from the Uruguay Round of the General Agreement on Tariffs and Trade (GATT).

Policies since the 1990s

Deregulation and liberalization were a fact of life in the agricultural sector of South Africa during the 1980s.⁴ Yet isolation from the world market, accompanied by the increased isolation of the country in the social, cultural, political, and intellectual spheres, meant that the deregulation steps that did take place were aimed at the domestic market. Foreign trade still consisted primarily of managing imports and exports in order to manipulate domestic prices (for commodities such as maize and wheat) or to protect monopoly export schemes (for fruit, for example). The steps that were taken were characterized by change within an existing institutional structure, because the main players remained in place despite the general relaxation in state intervention. The leadership structure itself then changed with the election of the Government of National Unity in 1994, although in agriculture some changes had to wait until 1996 after the withdrawal of the National Party from the Government of National Unity and the appointment of a minister of agriculture from the African National Congress party.

The most important policy initiatives taken after the advent of majority rule in 1990s included land reform, institutional restructuring in the public sector, the promulgation of new legislation including the Marketing of Agricultural Products Act and the Water Act, and trade policy and labor market policy reform, all within the framework of wider macroeconomic policy reform.

Marketing policy

The Marketing of Agricultural Products Act of 1996 changed the way in which agricultural marketing policy was managed in South Africa, not least by opening the sector to world market influences in a manner that could hardly have been

anticipated a decade earlier. The act, promulgated on January 1, 1997, set up the National Agricultural Marketing Council (NAMC), whose immediate task was to dismantle the existing control boards by January 6, 1998, after which it would manage and monitor state intervention in the sector.⁵

Land reform

Land reform was initiated in 1994, but the process of designing the actual land reform policy was not completed until 1997, when the Department of Land Affairs published its white paper (RSA 1997). Under this plan, land reform was to consist of land restitution, redistribution, and tenure reform programs, but the actual shape of the programs remained subject to much debate. A large proportion of the analytical work that supported the policy positions taken during these debates was subsequently published in Van Zyl, Kirsten, and Binswanger (1996). The program was designed more or less in accordance with the market-assisted approach recommended by the World Bank (1993). In practice, however, beneficiary households usually had to pool their meager (means-tested) grants to afford land from a willing seller. The reason was at least partly attributable to a 1970 law governing subdivision. Its repeal was provided for by Parliament in the Subdivision of Agricultural Land Act Repeal Act of 1998. Repeal has not yet been brought into operation by the president, however, and until subdivision is facilitated farm boundaries can rarely be redrawn into affordable pieces of land. Instead of subdivision, at the end of the 1990s a new approach, termed the Land Reform for Agricultural Development program, was adopted, which provided for an extended scale of grants, the size of which depended on the amount each farmer contributed (LRAD 2000). At the same time, the Comprehensive Agricultural Support Program was launched. Its purpose was to implement farmer support services such as research, extension, finance, information, and infrastructure.

Overall, the net effect of the land reform program has been limited. After 12 years of state-sponsored land reform, less than 4 percent of the land has been transferred.

Institutional restructuring in the public sector

One of the main features of South African agricultural policy in the 1990s was the extent of institutional restructuring that took place. Some institutions (such as the Development Bank, the Land Bank, the Agricultural Research Council, the Department of Regional and Land Affairs, and the Development Corporations in the former homelands) were believed to be too closely aligned with apartheid policies aimed at “development” of the former homeland areas or favoring commercial farmers (Callear and Mthethwa 1996; DBSA & LAPC 1997). Such institutions were subjected to restructuring programs intended to realign them in support of the development priorities of the new government.

Also, public sector agencies supporting the agricultural sector were subjected to the processes of “provincialization” established under the interim and then the final constitution. In the case of agriculture, the formerly race-specific “own affairs” and “general affairs” departments were amalgamated to form the core of the new national Department of Agriculture, new provincial departments were created, and the functions and staff from the former homeland departments of agriculture were redeployed to the new national or provincial departments as appropriate. All agricultural institutions in the public sector were reoriented to fit in with new policy directions. The most radical of these changes occurred in the agricultural marketing institutions.

Water law reform

Changes resulting from the new Water Act of 1996 were expected to have a severe effect on agriculture. These changes included the priority afforded to water uses that were more highly valued, including preferential access for small farmers and the environment, the termination of the riparian principle of water rights, the implementation of an integrated catchment management system, the termination of subsidized water prices, and greater cross-border cooperation between Southern African countries. Slow progress in the implementation of the act has, however, minimized its impact to date.

Labor market policy

Until the 1980s, farmworkers in South Africa had little legal protection of their rights to organize and of basic conditions of employment. The Agricultural Labor Act of 1993, addressed this shortcoming to some extent, but it was only after 1994 that farmworker rights were brought into line with rights of workers elsewhere in the economy. The four major labor laws in South Africa—the Labor Relations Act (1995), the Basic Conditions of Employment Act (1997), the Skills Development Act (1998), and the Employment Equity Act (1998)—all applied to the agricultural sector. One consequence has been the adoption of a minimum wage, differentiated by region, for farmworkers.

Trade policy

Quantitative restrictions; a multitude of tariff lines; a wide dispersion of tariff rates; and formula, specific, and ad valorem duties and surcharges characterized South Africa’s trade regime before 1994 (Lewis 2001; Edwards 2005). In agriculture, quantitative restrictions, specific duties, price controls, import and export permits, and other regulations were replaced by tariffs after 1994, when South Africa was among the original signatories to the Marrakech Agreement establishing the World Trade Organization following the GATT’s Uruguay Round negotiations. Surcharges

implemented in response to the balance of payments crisis in the late 1980s were also reduced and eliminated by 1995. The one exception to this process of liberalization was the sugar industry, where a price pooling system remained and the South African Sugar Association continued to be the only sugar exporter (OECD 2006).

South Africa also engaged in a number of bilateral and regional trade agreements. The three most important trade agreements in the southern African region are the Southern Africa Customs Union, which exhibits the deepest level of integration, the Southern Africa Development Community, and the South Africa–Zimbabwe bilateral agreement. Of the extraregional influences, the Lomé (and then Cotonou) preferences, the Africa Growth and Opportunity Act of the United States, and South Africa's separate bilateral agreement with the European Union are most influential.

Initial progress in rationalizing the tariff regime and lowering nominal and effective protection was fast. Between 1990 and 1999, the number of tariff lines was reduced from 12,500 in 200 tariff bands to 7,743 in 47 tariff bands or fewer than 2,500 in 45 bands if the zero tariffs are ignored. The maximum existing tariff was also reduced from almost 1,400 percent to 55 percent, and the average economy-wide tariff fell from 28 percent to 7.1 percent, although a number of tariff peaks remain. For example, tariffs in excess of 25 percent (and up to 45 percent) can be found on various meat products, tobacco, refined sugar, and beverages. Nevertheless, virtually all tariffs in agriculture are now below the bound rates of the Marrakech Agreement.

The structure of protection also affects agriculture. Tariffs on primary agriculture and other primary products are relatively low compared with tariffs on processed foods and other manufacturing. This tariff escalation, which is a typical aspect of trade policy in many countries, creates more dispersion in effective rates of protection than in the nominal rates for each product.

State support to agriculture

State spending on the farm sector, measured as the budgeted amounts for the national Department of Agriculture plus the agricultural budgets of the nine provinces, amounted to R2.8 billion in 1998. In real terms, this was 46 percent of the budget that the national former homeland agriculture departments had 10 years earlier, in 1988. The decline in state spending is also illustrated by the rapid decline of government funding of agricultural research. Baseline funding for agricultural research provided by government through the parliamentary grant system dropped from a high of R337 million in 1997 to R 262 million in 2001—equivalent to only 55 percent in real terms of the parliamentary grant it received nine years earlier, in 1992.

Direct and Indirect Distortions Facing Producers and Consumers

This section describes the evolution of direct distortions faced by producers and consumers in South Africa since the mid-1950s. The main focus of this study's methodology (see appendix A and Anderson et al. 2008) is on government-imposed distortions that create a gap between domestic prices and what they would be under free market conditions. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market), it also generates estimates of distortions in nonagricultural sectors for comparative evaluation.

More specifically, this study computes a nominal rate of assistance (NRA) for farmers, including an adjustment for direct interventions on inputs. It also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA).

Distortion estimates are calculated for approximately 80 percent of field crops and animal products (excluding fresh milk and eggs) and 65 percent of horticultural products (excluding vegetables). Distortion estimates are also calculated for related lightly processed products (wheat and maize flour, refined sugar, and sunflower oil).⁶

Some caution is required in interpreting the results presented below. Our distortion estimates are very volatile, reflecting volatile exchange rates and imperfect pass-through to domestic prices. Further, identifying appropriate international prices and transport and marketing margins proved difficult. For example, at times we find sudden switches from positive to negative nominal rates of assistance on import-competing products, without a concomitant change in agricultural policy.⁷ While such switches could be affected by adjustments to margins, the quality coefficient, or international reference prices, we have chosen not to do so, because these adjustments might induce further ad hoc misrepresentations to the existing data. In addition, not all data series were available from 1955, and a consistent database could be constructed only from 1965.

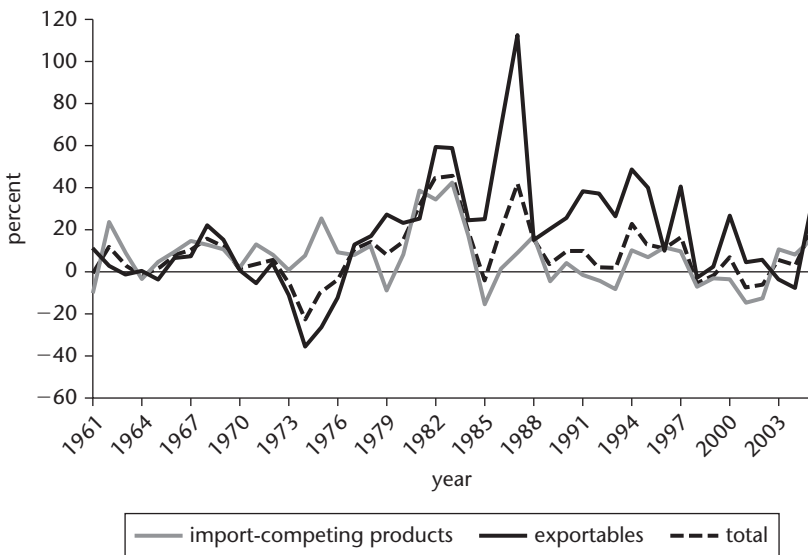
The analytical narrative of the changes in distortions presented below should be read in the context of the main policy shifters presented in the earlier sections of the chapter. As a reminder, the major structural changes were initiated sequentially, first by the initial voting power of white farmers, then by the impact of the sanctions era (especially on exports), then by the effect of democratization, and most recently by the impact of multilateral trade liberalization.

Nominal rates of assistance to agriculture

The estimates of the total NRA for farmers include the direct transfers that are summarized in Kirsten, Edwards, and Vink (2007, appendix table 2).⁸ All these support programs were suspended more or less at the time of the democratic transition in 1994–95. The extent of direct subsidization to commercial farmers was at its height during the 1970s, 1980s, and early 1990s. On average, estimates of the NRA in agriculture reflect a change in policy from one that was antitrade in the 1970s and 1980s to more-liberal markets in the 1990s, following reductions in both import protection and export taxation. The five-year average NRA for primary agriculture rose to a peak of 31 percent between 1980 and 1984, but then fell to less than 10 percent in the 1990s and remained close to zero after that. This is consistent with the abolition of the control boards and trade liberalization under the Marrakech Agreement on Agriculture.

There is substantial variation within these five-year averages. As shown in the annual data presented in figure 5.1, the average NRA for agriculture moved from

Figure 5.1. NRAs for Exportable, Import-Competing, and All Covered Farm Products, South Africa, 1961–2005



Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

slightly negative to slightly positive in the period 2000–04. The rise reflects to a large extent a relatively slow pass-through of currency shocks to producer prices during this period. The post-2000 period in South Africa is characterized by a substantial and rapid depreciation of the rand, from R6.9 per U.S. dollar in 2000 to R10 per U.S. dollar in 2002, and a subsequent appreciation to R6.5 per U.S. dollar in 2004. Domestic prices of some agricultural products, particularly processed products such as bread and maize flour, appear to be sticky downward during periods of declining agricultural input prices (Cutts and Kirsten 2006), resulting in relatively large increases in measured NRA.

Some variations in the trend level of distortions are also evident across importable and exportable products. With quantitative import controls in place for most of the period between 1960 and 1994, the positive NRAs on importables shown in figure 5.1 are not unexpected. These drop from an average of 10–21 percent in the 1980s to close to zero percent in the period 1995–2005, reflecting the demise of the control boards and the liberalization phase as South Africa complied with the requirements of the Marrakech Agreement on Agriculture. In all cases, except for poultry, the average NRA in the period 2000–04 was lower than the average during the 1980s. The trend in NRA is, however, volatile during the 1990s and early 2000s, reflecting an imperfect pass-through of the exchange rate to domestic prices as well as changes in the composition of exportables and importable products.⁹

Sugar products (sugarcane and refined sugar) have NRA values in excess of 40 percent for many periods, caused by high tariff protection as well as a pricing mechanism enabling import parity pricing despite sugar's being an export product. More generally, NRAs are volatile over time, especially during the 1970s and 1980s when the government attempted to smooth domestic farmgate prices. With smoothed domestic prices, international price and exchange rate volatility leads to volatility in the distortion estimates. The dispersion of NRAs among covered products has, however, declined since the early 1980s, consistent with the shift to a more market-oriented agricultural policy (see row near the bottom of table 5.1).

The picture for exportables could be confusing, given the high levels of average support of over 35 percent in the 1980s and 1990s. In this regard, it is important to recall the dominance of yellow maize and fresh fruit in South Africa's export portfolio up to 1995. After 1995, as deregulation and liberalization measures were introduced, the export portfolio shifted, and all measures to support exports and export losses were abolished. The peak of the NRA series for exportables in 1985–89 can be explained by the export of large quantities of maize at a huge loss. Much of the loss can be attributed to the decline in the world price (a 33 percent decline from 1985 to 1987) but a rise in the domestic price (44 percent from 1985 to 1987).

Table 5.1. NRAs for Covered Farm Products, South Africa, 1961–2005
(percent)

Product indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–05
Exportables ^a	3.3	9.6	-9.4	3.7	38.2	48.5	35.3	18.1	9.5
Sugar	32.5	43.3	-15.3	3.4	49.5	39.0	78.9	35.9	44.4
Apple	-6.1	-4.1	2.3	-10.6	-17.3	12.9	9.0	-7.3	0.7
Orange	-7.3	-17.9	-40.3	-28.3	-15.5	-18.2	-4.4	2.9	13.0
Grape	-20.6	-20.6	2.8	0.2	-33.1	23.6	5.5	8.8	6.7
Import-competing products ^a	4.9	10.5	6.4	9.3	28.3	1.5	0.1	3.7	0.6
Beef	7.3	16.4	4.2	34.6	52.2	0.9	-12.5	-0.6	-5.7
Sheep meat	19.5	13.6	40.1	39.0	28.3	32.4	33.1	23.4	4.1
Poultry	-12.9	-12.9	-15.7	-23.8	18.4	-2.9	6.5	12.9	6.0
Nontradables ^a	0.0	0.0	0.0	-0.9	-3.1	-6.1	-1.6	0.0	0.0
Apple	0.0	0.0	0.0	-0.6	-2.8	-6.0	-2.3	0.0	0.0
Orange	0.0	0.0	0.0	-1.0	-3.5	-6.2	-1.0	0.0	0.0
Grape	0.0	0.0	0.0	-0.6	-2.8	-6.0	-2.3	0.0	0.0
Mixed trade status ^{a,b}									
Wheat	-2.0	11.6	25.7	61.1	67.4	65.8	13.4	-0.1	7.6
Maize (yellow)	4.9	19.0	4.6	13.7	39.2	86.3	56.0	12.7	19.7
Maize (white)	-10.3	0.9	-20.0	-15.8	20.0	35.8	32.6	5.0	-7.8
Sunflower	18.9	17.7	6.2	7.2	19.9	7.4	6.9	-6.9	-2.9
Total of covered products ^a	3.3	9.5	-3.2	3.9	31.1	15.5	9.3	6.8	3.6
Dispersion of covered products ^c	15.3	18.8	25.0	31.1	42.7	38.3	34.5	20.4	21.7
Percent coverage (at undistorted prices)	68	67	69	68	64	66	68	68	69

Source: Data compiled by the authors.

a. Weighted averages, with weights based on the unassisted value of production.

b. Mixed trade status applies to products that are included in exportable or import-competing groups depending upon their trade status in the particular year.

c. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

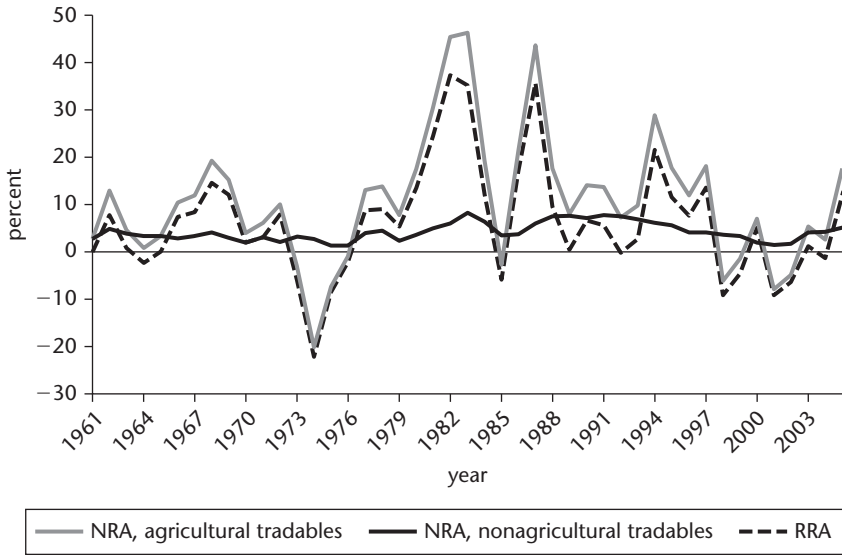
The large losses recorded in the exports of surplus yellow maize resulted in large shortfalls in the Maize Board's stabilization fund. The government bailed out the Maize Board with a payment of R400 million to cover the shortfall but indicated that the bailout would not be repeated. As a result the Maize Board changed its price policies to a single-channel pool marketing scheme (from a single-channel fixed price scheme) to ensure that shortfalls in the stabilization fund did not recur. Given the size of this sector, this shift in price policy caused a substantial increase in the aggregate NRA for exported agricultural products in this period. The relatively high NRA for exported products in the early 1990s is largely attributable to the sugar sector, where stagnant world prices for sugarcane and a sharp increase in domestic cane prices (the domestic price more than doubled between 1988 and 1992) led to high rates of assistance. The decline in the five-year average NRA after 2000 arose from relatively large declines in the NRA for white maize exports.¹⁰

The average NRA for lightly processed food products tends to follow about the same trend as shown for primary agriculture for most of the study period. Because we do not include dairy products, which have relatively high tariffs and a high producer support estimate (OECD 2006), our NRA for lightly processed products may be biased downward. NRAs for lightly processed products are generally higher in the 1980s and 1990s than the rates for primary agriculture. However, a decline in distortions is evident during the 1990s, although this decline has been offset by a rise from 2003. The recent increase reflects the appreciation of the rand (which rapidly lowered border prices), the relatively slow downward adjustment in domestic prices, and the rise in the NRA for refined sugar and processed meat products. These increases are not associated with changes in the policy environment, hence they are not expected to signify the start of a long-run upward trend in distortions.

Relative rates of assistance

A comparison of the NRA for agriculture with that for nonagricultural tradable industries (manufacturing, mining, and highly processed agricultural products) is presented in figure 5.2. The relative rate of assistance to agriculture (RRA), also presented there, reflects the incentive to produce agricultural relative to nonagricultural tradable products. Both the RRA and the NRA measures are likely to underestimate the actual level of distortions in the nonagricultural industries because collection rates (import duties over merchandise import value) are used as the distortion measure for manufacturing.¹¹ As is shown in Edwards (2005), collection rates underestimate protection in manufacturing, but unfortunately alternative measures are not available over the entire period.

Figure 5.2. NRAs for Agricultural and Nonagricultural Tradables and the RRA, South Africa, 1961–2005



Source: Data compiled by the authors.

Note: The RRA is defined as $100 * [(100 + NRA_{ag}) / (100 + NRA_{nonag}) - 1]$, where NRA_{ag} and NRA_{nonag} are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

The results suggest that distortions in the agricultural tradable sector were high relative to nonagricultural tradables during the 1960s, the late 1970s, and the 1980s. During the 1990s, distortions declined in both sectors but fell more rapidly in agriculture. The net effect was that by 2000–04, the incentive for resource allocation had shifted, albeit slightly, against agriculture and toward nonagricultural industries.

The results of the RRA estimates in table 5.2 and depicted in figure 5.2 clearly reflect the impact of deregulation. The trend in RRA follows that of primary agriculture closely, reflecting the relatively low distortions estimated in the nonagricultural sectors. The low levels of distortion in agriculture from the mid-1990s suggest that economic policies have a relatively neutral impact on aggregate agricultural production on average. However, the significant variation of NRAs within the farm sector, with some industries being taxed and others being protected, suggests there is still ample scope for efficiency gains within the farm sector were those differences in NRAs to be phased out.

Table 5.2. NRAs in Agriculture Relative to Nonagricultural Industries, South Africa, 1961–2005
(percent)

Indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–05
NRA, covered products ^a	3.3	9.5	-3.2	3.9	31.1	15.5	9.3	6.8	3.6
NRA, noncovered products	-1.5	0.1	-2.9	-1.4	4.0	-2.5	2.4	-0.3	-0.9
NRA, all agricultural products ^a	1.7	6.4	-3.3	2.1	21.2	9.0	7.0	4.4	2.0
Non-product-specific (NPS) assistance	2.4	3.0	2.5	1.7	1.7	2.7	3.8	1.3	0.1
Total agricultural NRA (including NPS) ^b	4.1	9.4	-0.7	3.8	22.9	11.7	10.8	5.7	2.1
Trade bias index ^c	0.01	0.00	-0.14	-0.03	0.07	0.40	0.33	0.13	0.11
NRA, all agricultural tradables	5.2	11.9	-0.7	5.2	31.7	17.5	14.6	7.9	3.2
NRA, all nonagricultural tradables	2.8	3.3	2.6	2.7	5.0	5.3	7.3	4.6	2.7
RRA ^d	1.5	8.4	-3.1	2.4	24.4	11.3	7.2	3.7	0.1

Source: Data compiled by the authors.

a. NRAs including product-specific input subsidies.

b. NRAs including product-specific input subsidies and non-product-specific (NPS) assistance. Total of assistance to primary factors and intermediate inputs divided to total value of primary agriculture production at undistorted prices (percent).

c. Trade bias index is $TBI = (1 + NRA_{ag_x}/100)/(1 + NRA_{ag_m}/100) - 1$, where NRA_{ag_m} and NRA_{ag_x} are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

d. For the definition of the RRA, see figure 5.2 note.

Comparison with OECD's estimates

Our estimates differ somewhat from the estimates of distortions in South African agriculture provided by the Organisation for Economic Co-operation and Development (OECD 2006). Looking first at the average distortion in primary agriculture, we find a decline in our NRA from 1994 to 2003 that is consistent with the decline found by the OECD in its price support estimates. The turning points are also largely consistent, except for 2000 and 2003 when our estimates of NRA rose sharply, while the OECD-derived NRA fell. As argued above, we attribute much of the difference in 2003 to imperfect pass-through of the appreciation in the currency to domestic wholesale prices. We also estimate a sharper decline in distortions than the OECD did for the period 1994–2002.

The distortion measures differ between the studies for a number of reasons. First, the studies use different international reference prices for some of our products, in particular beef and maize. These differences are discussed in more detail in the product-specific analysis that follows. Second, the coverage of the two studies differs. The OECD study includes pork, groundnuts, eggs, and dairy products, all of which we omit. The OECD study shows dairy products to have relatively high levels of distortions from 1994 to 1997, which may account for the relatively larger decline in our estimates of protection during this period but not afterward. Third, our study, but not the OECD study, splits apples, oranges, and grapes into traded and nontraded products because these products are not perfectly substitutable and have very different prices. Finally, there are important methodological differences in how distortions are measured. In the OECD study, when the producer price is lower than the international reference price (at the farmgate), a zero producer distortion is imposed. In our estimates if the producer price is less than the international reference price, we estimate a negative NRA. In the case of imports, this approach reflects the fact that the producer price is less than the import parity price. The lower domestic price may reflect quality differences, seasonal variation in international and domestic prices, or unmeasured margins and distortions in the domestic market. Rather than simply imposing a zero NRA, we have left our estimates as negative in these cases.

Policy Reform Needed to Deal with Existing Distortions

The results of this analysis confirm the general perception that since the mid-1990s South African agriculture on average has been operating in a nondistorted environment, where the net effect of price-distorting policies on aggregate resource use in agriculture seems to be neutral. The NRA and RRA results confirm that the sector on the whole is receiving virtually no policy support.

As stressed by Anderson et al. (2007), however, this conclusion does *not* mean that no further policy reforms need to be addressed. There is still considerable dispersion in NRAs within the farm sector, and in particular the sugar industry is still highly protected (as are the dairy and pig meat industries, according to OECD 2006). High NRAs are also found in the processing sector and reflect relatively high import tariffs on processed products and a potential lack of competition in the processing and retail sectors. It appears, for example, that the exchange rate appreciation of 2002 was only imperfectly passed through to domestic prices of processed agricultural products, a situation that led to significant increases in the NRA and the consumer tax equivalent (CTE) for processed products. The implication is that the policy reforms that have concentrated on primary agriculture may not have adequately filtered through to consumers. This is also shown in the high CTE relative to the NRA in primary agriculture. These conclusions are indicative and not conclusive, because the current study does not cover the full range of processed products. Nevertheless, the results suggest that the policy reform agenda should shift to the processing and retail sector.

For primary agriculture, the issue is to identify the policies—usually outside the ambit of the agricultural portfolio, such as labor legislation, land taxes, water tariffs, electricity rates, and road and fuel taxes—that reduce incentives for agricultural production. When the general deterioration of infrastructure, inefficiencies in government service delivery, poor facilitation in trade-related matters, and generally high costs of business operations are added, it is clear that South African agriculture faces rather difficult prospects.

Conclusions

South African agriculture has been subjected to major reform over the past 25 years: from internal market deregulation (from the 1980s within the then-existing institutional framework), to liberalization of trade (after the Uruguay Round Agreement on Agriculture in 1994), and then to further fast-tracking of deregulation under the new Marketing of Agricultural Products Act in 1997 (resulting in the abolition of the elaborate structure of commodity control boards). These events coincided with the last decade of the apartheid regime (the 1980s), the lengthy transition to democracy (1990 to 1994), and the first years under the new democratic constitution, respectively.

The first phase of internal market deregulation resulted from perceptions about the high fiscal burden of controlled agricultural marketing and about the efficiency costs of overregulation. Nevertheless, the institutions and mechanisms of control were kept in place. Trade liberalization, on the other hand, resulted directly from the new government's drive to create conditions of macroeconomic stability in the

country: the impact on agriculture was, therefore, a side effect of a larger policy objective. The comprehensive deregulation after 1996 reflects the urge to complete the process of deregulation, as well as the declining lobbying power of the commercial farming sector. In the process, however, the mechanisms through which small and emerging farmers can be supported have disappeared, even though there is increasing pressure on the government to provide such support.

In the light of the policy imperative for successful black economic empowerment and land reform, an important case can be made for the reintroduction of some of the programs implemented by the apartheid government in the 1950s and 1960s to empower Afrikaner farmers. There is also a powerful imperative not to repeat the mistakes of the past: overreliance on the state, direct intervention in markets that creates distortions, and an inability to foresee the high fiscal costs of intervention. To this end, future policies will have to accommodate a larger role for the private sector (commercial farmers and agribusiness), will have to be more market friendly, and will have to account for the country's obligations under the World Trade Organization (by using targeted "green box" assistance measures to support this important political imperative). Examples include an expansion of the Comprehensive Agricultural Support Program, improved access to financial services, the revitalization of extension services at the provincial level, and development of irrigation infrastructure. Such support services would need to be targeted at emerging farmers. It is likely that current political economy forces favor such initiatives, but whether this will hold true in the future is uncertain.

Notes

1. Because this chapter focuses on the commercial farming sector, the focus in the discussion falls on those policies that affected the sector directly, that is, on those policies that favored white commercial farming. For a more exhaustive discussion of the interplay of policy effects between commercial and subsistence farming, see Vink and Van Zyl (1998).

2. These sections borrow heavily from Vink (1999).

3. This discussion draws from Vink (1993).

4. This section draws on Vink and Schirmer (2002).

5. For a more detailed discussion on marketing policy, see Kirsten and Van Zyl (1996); Vink and Kassier (1991); and Vink (1993, 2000a, 2000b). See also the Kassier Committee Report (1992) on the details of the deregulation proposals.

6. To estimate the average distortion for all lightly processed products, we use the NRAs of products directly calculated in this study to estimate distortions for similar processed products not covered in this project. The products covered in this manner are as follows: slaughtering and preserved meat (weighted average NRA of poultry, beef, mutton), vegetable and animal oils (sunflower oil), sugar products (refined sugar), sugar confectionary (refined sugar), prepared animal feed, grain mill products, and bakery products (weighted average wheat and maize flour). Production values (at distorted prices) based on input-output tables are used as weights. Distortions in the highly processed beverages and tobacco products are not accounted for.

7. A domestic subsidy is consistent with negative direct rates of assistance on import competing products.

8. The lack of product-specific distortions in input costs implies that the NRA to farm production is equal to the NRA to farm output.

9. For example, yellow maize was an importable product with a negative NRA for the period 2002–04, but became an exportable with a high positive NRA in 2005. This raises the average NRA for importables in 2004.

10. White maize is not widely traded internationally. South Africa is one of the dominant producers of white maize, hence domestic prices are to some extent affected by domestic supply and demand conditions. The international maize price is based on yellow maize (U.S. No. 2 Yellow, free on board, Gulf of Mexico) and may not adequately proxy regional price fluctuations of white maize.

11. A zero tariff on services was assumed. Production values (at distorted prices), derived from various input-output tables were used to calculate the weighted average NRA for nonagricultural sectors.

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ZAMBIA

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Zambia is a landlocked country in central Africa with a population of 12 million people. The country has abundant land resources, favorable soils, relatively good rainfall and low population density.¹ A study of regional integration potential in southern Africa concluded that Zambia has the natural resources to be a major food and agricultural producer for the region (African Development Bank 1993), but this potential has never been realized. One important reason has been the dominance of copper in the economy: despite providing a livelihood to the majority of the population, agriculture as an export sector has always been subsidiary to mining.

During the colonial period, agriculture was developed primarily to serve the mining sector. Development was limited to the areas close to the line of rail running through the copper belt and the capital city, Lusaka, to Livingstone (near Victoria Falls on the Zambezi River). After independence, a more widespread form of development was intended, but squandering of the copper wealth in the first decade of independence (1964–74), when copper prices were high, was followed by a long period of economic turmoil and decline after the price of copper collapsed in 1975. A change of government at the end of 1991 resulted in the interventionist policies of the past being replaced by an orientation toward an open, more liberalized economy.

Changes in agricultural policies started earlier, and agricultural growth has been relatively high since the mid-1980s. By early in the 21st century, the share of agriculture in Zambia's gross domestic product (GDP) had risen to 20 percent.

* The authors are grateful for helpful comments from workshop participants, including Marianne Kurzweil and Ernesto Valenzuela. Detailed data and estimates of distortions reported in this chapter can be found in Robinson, Govereh, and Ndlela (2007).

From the viewpoint of diversifying away from dependence on copper, a more significant change was the growth of agricultural exports, from \$10 million in 1987 to \$222 million in 2004.² Despite recent progress, however, agriculture is still far from attaining its full potential as a contributor to the economy and to the well-being of the majority of the population whose livelihoods depend directly on farming.

In the first decade after independence, GDP grew at an annual average of 5.6 percent. From 1975, when the price of copper collapsed, to 1999, average GDP growth was only 0.6 percent. Since 2000, the growth rate of real GDP has accelerated to 6.2 and 6.3 percent, respectively, in 2006 and 2007 (IMF 2008).

Agricultural GDP growth rates have followed a different pattern from overall GDP. From 1971 to 1984, the average annual growth of agricultural GDP was 2 percent. Then came two five-year periods of much stronger growth (5.3 percent in 1985–89 and 7.7 percent in 1995–99), interrupted by the 1990–1994 period, when average growth was only 2.5 percent, pushed down by a devastating drought in 1992 (when agricultural GDP declined by one-third) and a severe drought in 1994 (when agricultural GDP declined by one-fifth). Despite these and other less significant drought episodes, agriculture's contribution to GDP grew between 1985 and 2000 in real terms and as a share of total GDP (from 15 to 20 percent). That increased agricultural output came principally from crops other than maize. The share of maize in the value of production of key crops fell from nearly 80 percent in the early 1980s to barely 50 percent by 2005 (even though the share of maize in household consumption remained much more stable (see, for example, Robinson, Govereh, and Ndlala 2007, appendix figures 4 and 5).³

The growth of the agricultural sector is attributable not only to the changes in agricultural incentives discussed in this chapter. The calculations show that agricultural incentives have been depressed over the entire study period (1955–2005). Negative assistance to agriculture was particularly evident in the 1970s and 1980s, but even after the opening up of the economy in the 1990s, agricultural producers have generally continued to receive prices well below border equivalents. There are three main reasons for this: the direct influence of agricultural policies, the monopsonistic structure of agricultural markets, and the indirect but significant influence of macroeconomic mismanagement, which has led to an overvaluation of the currency for most of the five decades covered by the study.

As is discussed in detail later, currency misalignment was significant from the mid-1960s to the mid-1990s, accounting for half or more of the magnitude of the distortions in the 1970s and 1980s. Even after the official exchange and the parallel market rates converged in the late 1990s (thereby eliminating currency overvaluation from the calculated distortion measures using the project's chosen methodology), there is still reason to suppose that the kwacha remained overvalued,

depressing agricultural incentives more than has been estimated using the available data.

While the calculations indicate that farmers were most heavily taxed in the 1970s and 1980s, the common perception among the farming community, especially small-holder farmers, was that these were the glory decades for farming. Land was even more abundant than it is now, and trading costs were low because the parastatal agricultural marketing agency, NAMBOARD, maintained a wide network of depots from which it delivered fertilizer, seed, and other inputs and purchased the crop at the farmgate, not at the depot. NAMBOARD, with its deficits met by taxpayers, absorbed the transport costs and did not seek to make a margin on transactions.

The terms of trade for farmers therefore were perceived to be relatively favorable in the 1970s and 1980s, whereas since then farmers have been of the view that they have to deal with “unscrupulous” businessmen, many of whom are not involved in the agricultural sector on a long-term basis. Contrary to what might have been predicted, private marketing costs may have increased after liberalization, and certainly a much higher level of risk has been passed on to farmers.

Over the five decades covered by the study, changes in agricultural and food policies have at no stage brought unambiguous improvements in the lot of the small-scale farmer. The extent to which agriculture and food policies have been conducive to the achievement of national socioeconomic goals has been the subject of a number of in-depth studies.⁴ The broad-brush picture is that the failure to achieve anything like the potential of Zambia’s agricultural sector, coupled with largely perverse effects of subsidies and other interventions in food markets, have imposed immense costs on the economy and account to a significant extent for the widespread persistence of poverty.

This is not to say that some policies and actions did not aim to promote agriculture and to alleviate poverty. However, the pattern of public expenditure reflected misplaced priorities, focusing on subsidies requiring large recurrent expenditures and delivering restricted benefits instead of productive investments with more widespread developmental consequences. Channeling resources into long-term investments in infrastructure, extension services, and market development would have had a larger payoff. The recurrent expenditures also invariably exacerbated differentials, further entrenching dualism. Before independence, almost all benefits went to European farmers, while after 1964, those subsidies and policies that did benefit producers also disproportionately favored farmers located close to the rail line, who have better access to inputs, transport, and marketing services.⁵

In recent years, rapid decreases in poverty have been measured in some rural areas resulting from rapid growth in output, but that growth has been very

unevenly distributed.⁶ The liberalization of the maize market and the emergence of hammer mills able to compete favorably with industrial mills on price and nutritional quality have benefited those rural households that are net food purchasers as well as urban households. However, the removal in the early 1990s of the maize meal subsidies, which had proved unsustainable in the late 1980s, coincided with the loss of employment associated with public sector reform and closure of manufacturing firms that were unable to compete with rapidly liberalized imports. Urban poverty thus rose rapidly in the early 1990s (McCullogh, Baulch, and Cherel-Robson 2001).

Agricultural Policy in the Colonial Period

Commercial agriculture was started in the early years of the 20th century to provide food to the copper mines and the capital city. European settler farmers were settled along the rail line and provided with various forms of assistance to encourage production of maize and other crops to the copper belt and other urban areas. Small-scale African farmers were deliberately disadvantaged, not least by being given significantly lower prices for their crops. This dualistic agriculture, which constitutes a structural distortion in the agricultural sector that persists to this day, was the result of deliberate policies initiated a century ago.

The settler farmer production system was well established by the 1920s. The international depression of the 1930s sharply reduced demand for copper. In the face of falling demand for agricultural goods, European and African farmers suffered extreme hardship during that period (McPherson 2004). In 1936, the government promulgated the Maize Control Ordinance, which resulted in the formation of the Maize Control Board. Its mandate was to stimulate production of maize while protecting European farmers from competition from African farmers. These objectives were achieved by raising the producer price of maize above world market levels for sales to the “internal pool,” three-quarters of which was reserved for European farmers. Additional maize was directed to the “external pool,” which involved sales at lower export parity prices (Jansen 1991). Urban consumer prices were set very low, with the control board’s losses being made up by substantial government subsidies.

World War II raised the demand for copper and hence for maize to such an extent that imports became necessary. Producer prices for maize for both African and European farmers were kept below import parity levels. While African farmers consistently received lower prices than European farmers, small-scale African farmers in remote areas had to contend with even lower net returns than their counterparts who were based within the Maize Control Board’s restricted area of operations (eight districts along the rail line).

After World War II, maize production began to exceed internal demand, and exports of maize were resumed. This trend continued during the Federal period (1953–1963), with the Federal Grain Marketing Board keeping producer prices above export parity levels. A discriminatory element was still evident, however. “Not all producers were subsidized, nor were they subsidized equally,” wrote one economist; “the African producer price was still considerably less than the European producer price because the government diverted part of the proceeds from sales of domestic maize to an African farming improvement fund.” (Jansen 1991, p. 278).

Measurement of Agricultural Distortions, 1955–2004

The main focus of the current study’s methodology (see appendix A in this volume and Anderson et al. 2008) is to measure the extent to which government-imposed distortionary policies create a gap between domestic prices and what they would be under free markets. The objective is to have simple measures of policy-induced distortions to agricultural prices that are uniform and comparable across time periods and between countries. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project’s methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market), but it also generates estimates of distortions in nonagricultural sectors for comparative evaluation.

More specifically, this study computes a nominal rate of assistance (NRA) for farmers that includes an adjustment for direct interventions on inputs. It also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA).

The basis of the approach is a comparison between the prices actually received by producers (or paid by consumers) and the prices that would have prevailed had there been no policy distortions. This approach reflects the assumption that the relevant opportunity costs are reflected in the international border prices for the commodities adjusted for nonpolicy price wedges such as transport costs, marketing margins, and quality differences. Where available, actual import and export prices are used in preference to the alternative of constructing synthetic border prices from international reference prices, adjusted for transport and related costs. Details of the data sources and assumptions made to generate the NRAs are laid out in the appendix of Robinson, Govereh, and Ndlela (2007).

In interpreting the NRA results presented below, the reader should bear in mind five points that arise from the way the domestic-to-border calculations have been made (as well as the limitations stemming from the poor quality of some of the data).

First, the wholesale level has been chosen as the point in the value chain where the ratios are calculated. Before economic liberalization, the wholesale level was composed of the state marketing boards, notably NAMBOARD for the crops covered by this study. The calculated NRA measures thus apply to farmers close to the depots and would be lower, meaning more negative in almost all years, for farmers living further away from the depots. After independence, the network of marketing board depots was extended into the rural areas beyond the rail line to improve the position of small farmers in remote areas, and panterritorial pricing was introduced.

Second, from 1961 to 1994, the wholesale prices used in the calculations are the minimum guaranteed prices to farmers. Those farmers able to market their products locally, or to engage in informal cross-border trade with neighboring countries (notably the Democratic Republic of Congo and Malawi), would have received higher prices and hence have been subject to higher (less negative) NRAs than have been calculated. Even in the case of tobacco, which was sold at auction, the prices available for and used in this study are the floor prices that the government set to protect farmers.

Third, farmers who received inputs from NAMBOARD were required to sell their crops through official channels, with a “stop order” system ensuring that the loans due on the inputs were repaid. While this system often may have involved low selling prices, the inputs themselves were typically subsidized, and the farmers nonetheless may have tried to enhance their incomes by selling at least part of their crops at higher prices.

Fourth, farmers able to store their crops until later in the season usually did much better than farmers who were forced to sell immediately after harvest at the minimum guaranteed prices. Studies have shown that even small farmers are well aware of the changing prices over the season and try to delay sales but typically have to sell a portion of their crops immediately after the harvest at the lowest prices to raise cash (Coulter et al. 1996; Mundia 1999). Even where monthly producer price data are available, there are no corresponding volume data, and so no basis to calculate a proper weighted average price for the year. Data from a 2003 survey on the month when the household had the largest sales, however, suggest that most crops are sold in the early part of the marketing season. Averaging the prices alone is obviously unsatisfactory when there is a large range of selling prices over a particular cropping season.⁷

And fifth, the prices used in the calculations for maize, sorghum, wheat, and sunflower after 1994 relate to trades conducted through Zambia’s Agricultural Commodity Exchange. Where possible, these are prices from actual sales, but in some months data for bid or offer prices are available. Here too there is the problem of annual average prices having to be calculated without weighting by sales

volumes. For these crops, any apparent improvement in NRAs is partly attributable to the change from a low minimum price reference point to actual market prices received by farmers. The commodity exchange prices are Lusaka wholesale prices, which are the highest a farmer can get. All prices outside of Lusaka and the main copper towns will be lower.

The Patterns of Distortions, 1955–2005

The annual NRA estimates for import-competing products and exportables are illustrated in figure 6.1, while five-year averages for individual products are shown in table 6.1.⁸ On a five-year average basis, the overall NRA results are within 2 to 4 percentage points of those calculated by Jansen (1991), the Zambia case study in the Krueger, Schiff, and Valdes (1991) project.⁹

Positive assistance for a decade or so after the Second World War was followed by a sustained half-century period of negative assistance to farmers. Policies encouraging import substitution of rice and wheat did result in positive NRAs for these crops for short periods (1979–84 and 1995–96 for rice; 1981–83, 1994–96,

Figure 6.1. NRAs for Exportable, Import-Competing, and All Covered Farm Products, Zambia, 1961–2004



Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

Table 6.1. NRAs for Covered Farm Products, Zambia, 1961–2004
(percent)

Product, indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Exportables ^{a,b}	-23.4	-30.3	-46.4	-58.2	-47.7	-77.0	-57.7	-45.9	-52.6
Groundnut	—	-41.5	-59.4	-68.7	-66.4	-78.2	-77.2	-66.7	-69.2
Cotton	—	-31.6	-36.6	-38.9	-37.7	-76.6	-34.9	-27.5	-51.4
Tobacco (Virginia)	-9.1	-18.4	-30.6	-57.2	-26.9	-77.1	-30.9	-5.2	-29.3
Tobacco (burley)	-12.0	-47.7	-37.1	-50.1	-37.6	-80.0	-23.4	-23.9	-58.1
Import-competing products ^{a,b}	-9.4	-21.6	-41.8	-55.0	-23.0	-67.8	-53.7	-27.0	-10.1
Rice	—	-14.6	-52.9	-13.9	29.8	-50.5	-27.2	9.5	-23.8
Wheat	—	-76.7	-60.0	-28.2	12.4	-69.3	-60.2	11.8	23.2
Nontradables									
Millet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sunflower	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed trade status ^b									
Maize	-27.0	-33.7	-41.6	-57.1	-23.1	-67.6	-52.4	-28.3	-29.8
Sorghum	—	-15.4	-34.4	-64.1	-57.1	-73.7	-53.8	-50.9	-25.0
Soybean	—	-77.6	-71.3	-39.8	-33.4	-60.7	-54.7	-31.0	-15.7
Total of covered products ^a	-24.3	-32.8	-42.2	-57.3	-25.5	-68.2	-53.4	-33.6	-34.2
Dispersion of covered products ^c	21.8	32.6	26.8	36.2	35.1	33.8	39.4	35.7	33.2
Percent coverage (at undistorted prices)	78	77	76	75	74	72	71	69	67

Source: Data compiled by the authors.

Note: — = no data are available.

a. Weighted averages, with weights based on the unassisted value of production.

b. Mixed trade status products included in exportable or import-competing groups depending upon their trade status in the particular year.

c. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

and 2000–04 for wheat; and a few other separate years for both commodities). Otherwise, occasional positive rates for maize, sorghum, soybeans, cotton, and tobacco result from coincidental upward movements in domestic prices, currency devaluation, or reductions in the reference border prices (and vice versa for negative spikes). These coincidental factors are absorbed in the five-year averages presented in table 6.1, where the only positive rates are for rice (1980–84 and 1995–99) and wheat (1980–84, 1995–99, and 2000–04).

The patterns of assistance or taxation are the result of the interplay of a number of different influences. The direct influences arise from agricultural sector policies, which are discussed in detail in the next two sections. In explaining the changes in NRAs, it is not just the stated policies that matter, but also the way they are implemented as reflected in the institutional structures, price regulations, and financial flows to the agricultural sector (such as subsidies and public sector investments). Particularly in the period since liberalization, the impact of these policies has been tempered by the nature and structure of agricultural markets. These structural issues are important in explaining the pattern of assistance to Zambian farmers.

Another key part of the explanation for the NRA pattern lies in the indirect effects of the macroeconomic and trade policies pursued. Detailed aspects of these are discussed below, but it is relevant at the outset to stress that the main macroeconomic influence occurs through overvaluation of the exchange rate. Using the crude measure of the parallel market premium, the Zambian kwacha appears overvalued from the early 1960s to the end of the 1990s. In years where the parallel rate is way out of line with the official rate (such as 1977 or 1988), the world parity price in kwacha (which appears in the denominator of the NRA formula) is much higher than the value calculated with the official exchange rate. The NRA values for years such as 1977 and 1988 are thus suddenly much more negative. This results in a mirror-image downward swing in the NRA curves, reflecting the upward swing in the exchange rate premium. Except for import-competing products in the 1980–84 period, the growing exchange rate overvaluation during the 1970s and 1980s amplifies what would be (at the official exchange rate) far more modest levels of negative assistance. The progressive reduction in overvaluation since the 1980s brings the calculated NRAs increasingly closer to what they would be had official exchange rates been used in the calculation.

For the entire period of this study, the overall patterns that emerge are of increasingly negative assistance to agriculture during the periods of dirigiste control over the economy, which were also years of significant overvaluation of the exchange rate. Economic liberalization is the hallmark of the Third Republic, which started in 1992. During the 1990s, macroeconomic stability was progressively restored and many of the former controls over the economy, including those

pertaining to agriculture, were unwound. As is clear from figure 6.1, these measures are less negative than in the 1980s, but they did not lead to positive NRAs for agriculture, in part because the government in fact adopted a half-hearted approach to liberalizing agricultural markets.

Fertilizer and maize markets provide two key examples of areas where the government did not completely give up control and where full liberalization has yet to occur. However, consumers did benefit from increased competition in the more liberalized market environment, which resulted in lower processing and marketing margins. Data from the Ministry of Agriculture show that real maize meal prices had a downward trend, while real maize grain prices remained virtually stable between 1990 and 2005.

NRAs by commodity

Maize constitutes on average two-thirds of the total value of the commodities being studied, and hence the maize NRA to a large degree determines the average NRA for agriculture as a whole. The NRA for maize suggests producer prices have been between one-fifth and two-thirds below what they would have been in an open-economy environment, peaking at -68 percent in 1985–89. The other traded cereal crops (sorghum, wheat, and rice) generally have very large negative five-year average NRAs, but in some periods they reverse to low negative or even positive values. In the most recent 10 years, the government had a 15 percent import duty on wheat, to compensate those farmers who had invested in wheat production but faced high costs of fuel and electricity compared with competitor wheat producers.

Among the traded oilseeds, the NRA for groundnuts is severely and consistently negative, with soybeans also always negative but less severely so between 1995 and 2004. The NRAs for the export cash crops, cotton and tobacco, tend also to be large and negative up to 1990, the worst period being 1985–89. Even in the most recent period, 2000–04, tobacco NRAs are still very negative (burley -58 percent, Virginia -29 percent), as is the NRA for cotton (-51 percent).

Assistance patterns for tradable products and for agriculture as a whole

The patterns for import-competing products and exportables both follow the overall pattern of exchange rate misalignment. As a result, the largest negative NRA values for both were in 1985–89, followed by 1975–79, with a continuous improvement for import-competing products since 1990. For any particular commodity, a change in status from import-competing to exportable would tend to

make its NRA less negative because the cost, insurance, freight (cif) import price is almost always higher than the free on board (fob) export price. All else being equal, the average NRA for import-competing products might be expected to be more negative than the average NRA for exportables, but that is not the case for Zambia. The reason is that in the weighted average across all import-competing products there is a preponderance of import-competing foodstuffs that (through relatively higher producer prices) are taxed less than exportable cash crops. By 2000–04, the NRA for import-competing products improved to -10 percent, while the exportables' NRA became even more negative than in the 1995–99 period (-53 percent, compared with -46 percent).

The third-to-last row of table 6.1 gives the weighted average rates of assistance for all of the commodities covered in this study. This is the same as the first row in table 6.2. When the guesstimated NRAs for noncovered products (which account for between one-sixth and one-quarter of the gross value of farm production) and for non-product-specific agricultural subsidies are included, the sector's negative NRA is considerably reduced. The tradables part of agriculture faces more discrimination than the nontradables part, however. By contrast, the tradables part of nonagricultural industries has a positive weighted average NRA, with trade taxes and distortions to the exchange rate assisting import-competing producers more than they are hurting exporters (mainly, the mining sector). Thus the relative rate of assistance is more negative than the NRA for agricultural tradables (table 6.2 and figure 6.2).¹⁰

The growth in agriculture's contribution to GDP and exports took off with a lag following the changing levels of disincentives to agriculture, that is, not until the early 1990s. The most significant development was the growth of floriculture and horticulture, whose exports contributed significantly to the impressive rise in overall agricultural exports, from under \$20 million a year in the late 1980s to over \$150 million in the new millennium. That represents an annual growth rate of more than 30 percent. But note that floriculture and horticulture—whose NRAs have not been estimated—enjoyed special assistance through duty drawback arrangements on imported equipment and a zero rating value added tax (VAT) status (claiming VAT on inputs without being charged VAT on output sold in the domestic market). This rapid export growth occurred alongside negative NRAs for the export crops covered in this study. Had these new industries been included, the estimated NRA for agriculture as a whole would have been somewhat less negative.

Had the exchange rate not been distorted, the agricultural NRAs and RRA would have been only slightly less negative (bottom rows of table 6.2), suggesting that exchange rate distortions are not the major reason for the antiagricultural and antitrade bias.

Table 6.2. NRAs in Agriculture Relative to Nonagricultural Industries, Zambia, 1961–2004

(percent)

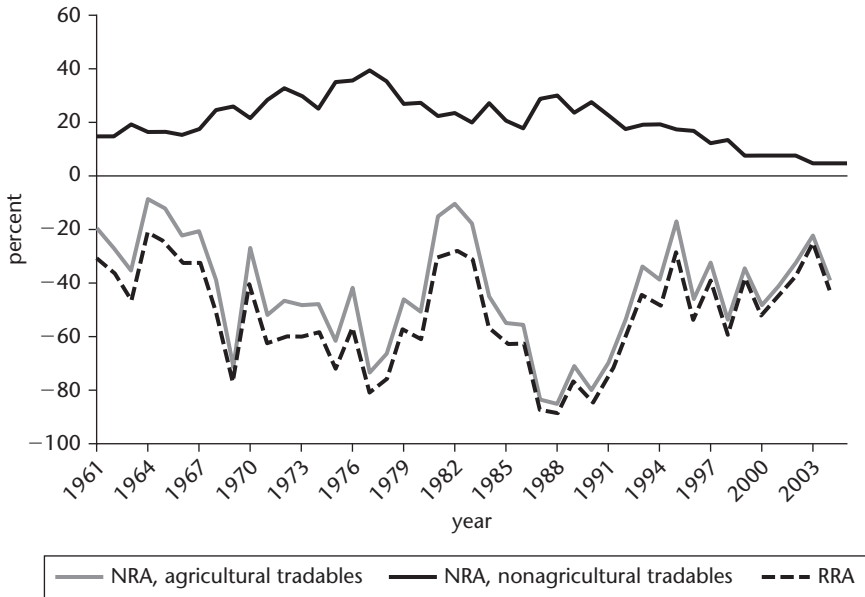
Indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRAs, covered products	-24.3	-32.8	-42.2	-57.3	-25.5	-68.2	-53.4	-33.6	-34.2
NRAs, noncovered products	-4.0	-15.2	-23.9	-34.7	-16.5	-51.6	-36.3	-26.5	-23.0
NRAs, all agricultural products	-19.7	-28.0	-36.8	-49.5	-22.6	-60.8	-46.5	-31.3	-31.3
Non-product-specific (NPS) assistance	—	5.8	22.4	13.7	20.9	2.7	18.1	2.7	2.8
Total agricultural NRA ^a	-19.7	-22.6	-15.8	-37.3	-2.7	-58.9	-30.8	-28.6	-28.5
Trade bias index ^b	-0.21	0.10	-0.06	-0.08	-0.30	-0.28	-0.08	0.00	-0.41
NRAs, all agricultural tradables	-22.6	-33.1	-44.3	-57.9	-27.7	-70.0	-55.3	-36.7	-36.5
NRAs, all nonagricultural tradables	16.1	20.0	27.6	34.5	24.1	24.2	21.2	13.5	6.4
RRA ^c	-33.4	-43.6	-56.2	-68.5	-41.5	-75.4	-62.7	-44.2	-40.3
Memo item, ignoring exchange rate distortions:									
NRA, all agricultural products	-19.1	-18.3	-11.3	-17.9	-9.2	-63.1	-31.4	-25.3	-24.8
Trade bias index ^b	-0.16	0.45	0.63	1.17	0.10	1.63	0.64	0.12	-0.41
RRA ^c	-30.8	-36.3	-48.4	-49.0	-41.8	-74.2	-61.6	-38.9	-36.1

Source: Data compiled by the authors.

Note: — = no data are available.

- NRAs include product-specific input subsidies and non-product-specific (NPS) assistance. Total of assistance to primary factors and intermediate inputs divided to total value of primary agriculture production at undistorted prices (percent).
- Trade bias index is $TBI = (1 + NRA_{ag_x}/100)/(1 + NRA_{ag_m}/100) - 1$, where NRA_{ag_m} and NRA_{ag_x} are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.
- The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 6.2. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Zambia, 1961–2004



Source: Data compiled by the authors.

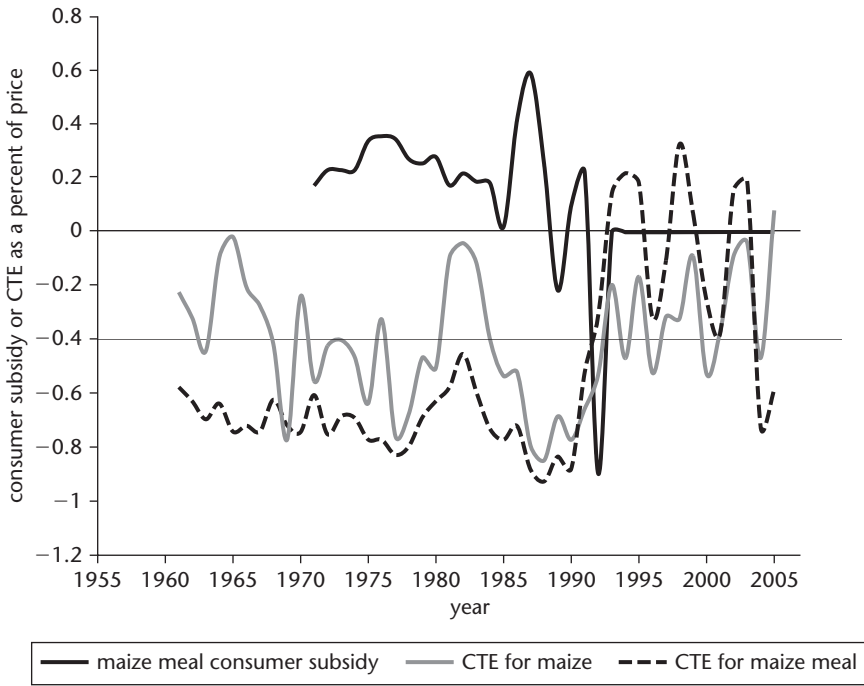
Note: For the definition of the RRA, see table 6.2, note c.

Consumer tax equivalent patterns

In this study, the NRAs and consumer tax equivalents (CTEs) are calculated at the wholesale level. Consequently, it is only when farmers or consumers receive direct subsidies on product prices that the calculated primary producer NRA will differ from the CTE. In the case of Zambia, there are no such subsidies (only farm input subsidies) and thus the primary product CTE is always numerically identical to the corresponding NRA. The negative assistance to the primary producer is mirrored by an implicit subsidy of the same magnitude for the consumer. In a country where the power base of the ruling party is drawn from the urban areas, it is not surprising that agricultural pricing policies should have produced this result.

The only processed product for which the data exist to do a separate CTE calculation at the retail level is maize meal. The most common grade for popular consumption is roller meal, so results presented in figure 6.3 refer to that as the benchmark form of maize meal. The basic data used for the CTE maize calculation are the wholesale producer price and the cif import price of maize. For the roller meal CTE calculation, the numerator is the maize price plus processing and

Figure 6.3. Maize and Maize Meal CTEs and Consumer Subsidy Payment, Zambia, 1955–2004



Source: Data compiled by the authors. Maize meal prices are for roller meal.

wholesale margins, while the denominator is the cif price of maize meal. The subsidy is calculated as the theoretical price of roller meal (the wholesale price of maize adjusted for the extraction rate, processing, wholesale, and retail margins) compared with the actual retail price given by Central Statistics Office data for roller meal. The wholesale and retail margins are assumed to be fixed at 12 percent and 8 percent, respectively, while the processing margin is assumed to be 24 percent before liberalization and to adjust from 1993, so the retail price reflects the fact that consumer subsidies were no longer provided by government.

Given these assumptions, figure 6.3 suggests that in the 1970s and 1980s the CTE for maize meal was even more favorable to consumers than the CTE for maize grain. From 1991, however, the results suggest that the implicit consumer subsidy for maize meal has been less than that available for maize grain, with the graph moving into the positive range (an implicit consumer tax) in 1994, 1998, and 2003. The consumer subsidy graph shows how hazardous calculations of this sort are. This estimation approach produces plausible results in most years (cumulated margins

dropping from 50 percent to 33 percent as a result of liberalization) but also some aberrant years (1989 and 1992). There are also implausible processing margins (in 1996, 1999, and 2001) that occurred because these calculations are made for the industrial millers, whereas many consumers switched to buying maize grain and having it milled by small hammer mills at a more modest cost (see below).

Policies behind the Distortions: 1964–1991

At independence in 1964, there were high hopes for Zambia. Per capita incomes then averaged three times those in the Republic of Korea, copper prices were high, and the new government was committed to using copper wealth to raise education and living standards and diversify the economy. By the end of the Second Republic in 1991, the economy was in crisis, with zero growth in GDP, savings and investment at low levels (8.4 percent and 11 percent of GDP, respectively), shortages of basic goods, inflation in triple digits, the budget deficit (excluding grants) at 16.2 percent of GDP, and debt service the equivalent of 66 percent of export revenues (Robinson 2004). Poverty was widespread, with 58 percent of the population deemed to be living in extreme poverty.

Background

After independence in 1964, it was expected that policies would be put in place that would significantly enhance the position of African farmers. President Kenneth Kaunda responded to calls to boost small-scale agriculture by announcing a “fair price” policy for agriculture. But as McPherson (2004, p. 306) put it, “Though originally intended to raise the prices received by African producers, the initiative quickly became a ‘low price’ policy designed to reduce the cost of staple food for urban workers.” This pro-urban bias, reflecting the base of political support for the ruling party, set the tone for pricing in the Kaunda era, which lasted until the end of 1991. However, to keep farmers from becoming politically agitated, low producer prices were offset somewhat by government provision of subsidized farm inputs.

In the first year of independence, the world price of copper rose by 50 percent, and copper prices remained high throughout the so-called First Republic (1964–73). Despite the problems associated with the imposition of international sanctions on the illegal regime in Rhodesia after 1965, economic conditions in independent Zambia were buoyant initially. Output of agricultural commodities increased, though rather modestly. The five-year moving average of total cereal production increased from 740,000 metric tons in 1964 to 850,000 metric tons in 1969 and over 1 million metric tons by 1974, according to data from the Food and

Agriculture Organization. This increase is equivalent to annual growth of only 3.1 percent, whereas the average annual population growth rate over the decade was 3.4 percent.

One of the main strategies the government adopted in pursuit of its agenda of diversifying away from copper and creating greater social equity was to take greater direct control over the economy. After 1968, a vigorous program of nationalization was launched, through which the government acquired a majority stake in many large private enterprises and also created a number of new parastatals. This nationalization shifted the locus of economic decision making decisively to the public sector, while at the same time the government became progressively more interventionist in its approach to economic policy making. In the agricultural sector, the setting of producer and consumer prices for agricultural commodities became the norm, while trade policy came to be characterized by import licensing, foreign exchange allocation, and quantitative import controls.

The start of the Second Republic in 1973 was marked by the formal introduction of a one-party state. In the aftermath of the 1973 global oil crisis, commodity markets collapsed. The copper price fell sharply (by 40 percent in 1975), while at the same time the price of fuel and other key imports rose sharply. Copper prices in real terms have never returned to the high levels of the first decade of Zambia's independence (although they are coming close in the 2007–08 boom period). In the mid-1970s, the government assumed that low copper prices would be a temporary phenomenon and did not therefore seek to make fundamental changes in the patterns of consumption and production in the economy. In the short term, however, levels of imports had to be sharply reduced, GDP growth turned negative, government revenues fell sharply, and inflation and domestic debt rose. Moreover, Zambia began to accumulate significant levels of external debt which henceforth became a major restraining factor in macroeconomic policy making.

The introduction of the one-party state in 1973 heralded an intensification of the dirigiste tendencies in economic management that had been evident in the early years of independence. As macroeconomic and balance of payments problems grew, the government increasingly turned to international donors for assistance. The government's orientation ran counter to donor policy prescriptions, particularly those of the World Bank and the International Monetary Fund. This resulted in a succession of half-hearted reform attempts in the 1980s, interspersed by populist measures intended to head off growing political discontent.

The clearest example of such populism is provided by the heavy commitment to consumer subsidies of maize meal. The budgetary requirements for these subsidies grew to proportions that by the mid-1980s destabilized the national budget. When reforms in December 1986 doubled the price of breakfast meal, which is a

slightly higher grade of maize than roller meal, there were riots in the copper region and the increases were hastily withdrawn. In May 1987, President Kaunda announced a break with the Bretton Woods institutions and the introduction of a homegrown recovery program, but this too did not last. By 1989, the country had negotiated a policy framework paper with the World Bank and the International Monetary Fund. Devaluation, removal of price controls, and institutional reform followed.

In the food sector, these economic reforms involved a tripling of the maize price, offset by the introduction of a coupon system to provide a targeted subsidy, and the scrapping of the parastatal marketing organization, NAMBOARD. The increased prices led to more maize meal riots in June 1990, when 19 people died, and also to a coup attempt on June 30, 1990. An opposition party emerged soon after, and it was legalized in time to contest the October 1991 elections. The maize meal subsidy was increased again before the election, but that did not prevent the defeat of President Kaunda's party.

Agricultural and food policies

At independence in 1964, the new government's agriculture and food policies were shaped by concerns about equity and food self-sufficiency. Equity required increasing the involvement of small-scale farmers in the market economy, while the food concerns revolved around feeding the rapidly growing urban population. These objectives had immediate built-in tensions for food prices, which were always biased toward urban workers who constituted the bedrock of the ruling party's power base. The agricultural measures the government adopted to offset low producer prices included a broader range of agricultural services provided at subsidized rates, such as credit, fertilizer, tractor plowing, and marketing. These services were extended throughout the country, most visibly through expanding the network of the Agricultural Rural Marketing Board depots, which did have some positive equity impacts, increasing the participation of households in remote areas in producing for the market.

Uniform panterritorial pricing, introduced in the 1974–75 crop season, gave further assistance to farmers in surplus-producing provinces away from the rail line who had hitherto had to meet the high cost of transport to urban markets. But the uniform pricing penalized farmers in maize-deficit areas where prices would otherwise have been higher. Under the old system, farmers in these areas received prices above the national average to cover the cost of transport from elsewhere, but they now had to sell at the same panterritorial price as the source regions. Uniform pricing was billed as being synonymous with equity, but analysis of the consequences indicates that the opposite was the case. "Uniform pricing

depressed the price received by the poorest segment of the population, i.e., farmers in the distant (non border) deficit areas and has inflated the price received by better-off (and more politically vocal) farmers in surplus regions, particularly the Eastern province,” Jansen and Rukovo (1992) wrote. Panterritorial and panseasonal pricing encouraged the production of maize in areas not suited to the crop and also greatly increased the transport costs that had to be covered by subsidies to NAMBOARD, which had taken over the marketing depot network.¹¹ Combined with consumer subsidies on maize meal, fertilizer subsidies, and smaller subsidies for other crops, the fiscal requirements of agricultural subsidies grew to be a significant drain on national resources, reaching a peak of 6.7 percent of GDP in 1980 (McPherson 2004).

In addition to maize, minimum producer prices were set for the other major crops, and it is these prices that have been used for the NRA calculations. Jansen (1991) notes that these prices were based on costs of production and were always well below border-equivalent levels, with partially compensating direct assistance being given to farmers in the form of subsidies on inputs and transport. The producer prices were adjusted to influence crop choice through maize—the prices of other crops were held down when the government decided greater maize production was necessary, and vice versa. Parastatal procurement agencies had a mix of legal and de facto monopsonistic control over primary agricultural markets. These agencies were either inefficient (in the case of groundnuts, for example) or enjoyed high rents from the low farmgate prices (in the case of cotton).¹² Tobacco was marketed through an auction, but the government provided a floor price to encourage farmers to produce tobacco without the risk of prices falling below costs of production in poor years.

Macroeconomic and exchange rate policy

As these agriculture and food policies were becoming entrenched, poor macroeconomic policies following the crisis induced by the dramatic fall in the world copper price in 1975 plunged the country into persistent internal and external imbalance. These macroeconomic problems were induced when Zambia failed to adjust its exchange rate in the face of high inflation; the consequence was falling export receipts. More and more reliance was then placed on quantitative restrictions and tariffs to restrain imports, and increasing levels of foreign borrowing were needed to sustain even that restricted level of imports. When new lending from international private banks dried up, the government was forced to approach the Bretton Woods institutions for assistance.

Over the next decade, economic reform promises were made but were never fully supported politically, and the result was a series of failed reform programs

funded by short-term surges of foreign aid. The first of these was an Extended Fund Facility granted by the International Monetary Fund in 1981 and discontinued in 1982. The Memorandum of Development Objectives and Policies that Zambia and the World Bank signed in early 1983 included increased prices for maize meal and fertilizer and flexibility in setting other prices (subject to ex post review) as well as significant macroeconomic and trade policy reforms, but the Bank suspended disbursements in October 1983 when the government fell into arrears after unilaterally suspending debt payments.

After the 1983 elections, President Kaunda promulgated an intensified version of the economic reforms, but the policy improvements had to contend with a further slide in copper prices, drought, and a dip in aid. Popular dissatisfaction with economic conditions led to student riots in February 1984 and industrial unrest in the first half of 1985. In response, financial policies were relaxed, thereby aggravating Zambia's fiscal and external debt problems and leading to a fresh appraisal of the government's policy stance.

In October 1985, a comprehensive structural adjustment program was launched. This included a foreign currency auction that resulted in rapid depreciation of the kwacha. Food prices rose dramatically as a result of the depreciation and reduction in subsidies, leading to the food riots in December 1986 that were mentioned earlier. This incident led to policy reversals, including the suspension of the foreign exchange auction in early 1987 and full-scale repudiation of the structural adjustment program on May Day 1987, when a homegrown program was announced. By October 1987, however, the government had reopened discussions with the World Bank and there was a gradual return to structural adjustment measures over the period 1988–1990. Exchange rate policy remained central: the kwacha was devalued and a new foreign exchange auction system was introduced (intended more to allocate foreign currency than to set the rate). Exporter retention schemes and (from 1989) a formal multiple exchange rate system became operational.¹³

In 1989, all consumer prices except maize were decontrolled and NAMBOARD was abolished. The fiscal burden of maize subsidies was reduced by tripling the maize price and introducing a coupon system to allow for targeting of the remaining maize subsidy. The country was still cut off from assistance from the multilateral institutions, but the positive measures taken regarding exchange rates and subsidy reductions paved the way for a Policy Framework Paper to be agreed on in 1989 and relations to be restored in early 1990. In the run-up to the elections, however, the Kaunda government abandoned adjustment one last time. Expansionary fiscal measures included increases in wages and in maize and other subsidies. President Kaunda's United Independence Party was nonetheless defeated in the October 1991 elections, ushering in a fresh epoch under a new party, the Movement for Multiparty Democracy.

Policies behind the Distortions: The Period since 1992

The new government of President Frederick Chiluba committed itself to the program that its predecessor had negotiated and then abandoned. Donors pledged extensive support, including substantial food aid to counter the effects of the 1991–92 drought, which was of a once-in-a-century severity. The government acted swiftly on several economic policy fronts, particularly the exchange rate and trade liberalization. The foreign exchange auction was broadened, and *bureaux de change*, introduced in September 1992, led to the unification of the exchange rate by December 1992. Export bans (except on ivory, oil, maize, and fertilizers) were removed and all imports, bar a small negative list, were liberalized by September 1992. Import tariff rates were reduced to six levels in the 1991 budget, with the new minimum and maximum rates being set at 15 percent and 50 percent respectively, and the number of duty-exempt goods was reduced. These changes resulted in a dramatic opening up of the economy to imports, not least from neighboring countries, which enjoyed 70 percent preferences (rising to 100 percent in later years) under the Common Market for Eastern and Southern Africa and bilateral agreements.

These steps greatly improved the availability of basic goods but also resulted in large-scale closures of businesses and loss of jobs, particularly in the manufacturing sector. The social impact of the loss of employment could have been mitigated by adopting a more gradual approach. The pace and sequencing of trade and other economic reforms have also been criticized (for example, by Botchwey et al. 1998) as being a major cause of the persistent instability of the macroeconomy throughout the 1990s. The period was characterized by high inflation, a volatile and generally overvalued exchange rate, high real interest rates, and a banking system oriented to financing the government deficit rather than to servicing the credit needs of productive enterprises. The long delay in the privatization of the copper mines was extremely costly both within the copper sector itself and in undermining the progrowth orientation the Chiluba government supposedly supported.

Overall, the economic environment in the 1990s was not conducive to fulfilling one of the basic intentions of the new government, namely, that private investment would spearhead economic growth. The fact that nontraditional exports, including agricultural exports, grew significantly over the period, is claimed as contrary evidence. A more pertinent question arises from the counterfactual—by how much more would the nontraditional exports have grown if the environment had been truly conducive to private sector growth?¹⁴

The pattern of growth of agricultural exports provides interesting perspectives on this question. The removal of exchange controls, improvement in input

supplies, opening of markets, and improvement in transport services did encourage an expansion of agricultural exports in the 1990s, but the persistence of negative NRAs for the main agricultural commodities, particularly exportables, can be interpreted as *prima facie* evidence that agricultural exports could have grown even faster than they did. The agricultural subsectors exhibiting the most dramatic growth—floriculture and horticulture—involved very few farmers who, having gained access to European markets, exploited them by insulating their operations from domestic policy changes by establishing offshore arrangements for inputs and spare parts (McPherson 2004). In particular, they benefited from duty drawback arrangements and VAT zero ratings and can be said to have grown to a significant extent because of the policy environment.¹⁵

Growth in exports of traditional agricultural products, on the other hand, together with growth in processed food exports (notably maize meal exports to the Democratic Republic of Congo), were rather more “in spite of” than “because of” the policy environment.¹⁶ Much the same can be said of other changes in the agricultural sector. At first gloss, a good deal was achieved very soon after the new government came to power in fulfilling its stated commitment to withdrawing government from direct intervention in the agriculture sector. In the midst of the drought and large imports of food that the drought required, maize meal and fertilizer subsidies were removed. Various agricultural reform programs were launched in 1992–93, notably those targeted at liberalization of maize, agricultural input markets, and agricultural credit schemes. In 1995, the milling industry was privatized, and the World Bank-led Agricultural Sector Investment Program was initiated.

However, these reform programs were not carried through with the vigor that was needed to produce the required results. The government commissioned a maize marketing study that recommended that the government should fully withdraw from maize and fertilizer marketing and retain only a small role in establishing an agency to hold modest stocks for food security purposes. The Food Reserve Agency was duly established in 1996 but soon was required to take on additional roles. The government justified extending the agency’s mandate by saying that the private sector response to the government’s withdrawal from input and product had been inadequate. This is ironic, because the supposedly poor response is clearly a result of continued intervention by the public sector and the associated unpredictability and risks that the intervention involves for private entities.¹⁷

The resources associated with agricultural credit schemes initiated by the new government were used inefficiently or misappropriated (or both), so the objectives of the schemes were thwarted. The fate of the marketing and fertilizer credits made available to lending institutions in 1992/93 and 1993/94 were subject to a special investigation commissioned by the minister of finance. The Agricultural

Credit Management Program launched in 1994 was also poorly implemented, giving rise to high administrative costs, low credit recovery, and corruption. McPherson (2004) concludes that the principal function of agricultural credit in Zambia has been to redistribute wealth to relatively well-off farmers, rather than to expand agricultural output.

The Agricultural Sector Investment Program, which was supposed to be a landmark example of a coordinated multidonor, sectorwide approach, unifying 180 separate donor-funded projects, has also largely been deemed to be a failure. The World Bank itself, through its Operations Evaluation Department, rates the outcome as unsatisfactory, sustainability unlikely, and institutional development modest (World Bank 2003). These ratings pertain to the original objectives—improve household food security, make better use of natural resources, generate employment, raise incomes, and increase exports—objectives that “were not achieved,” according to the evaluation. The project was later restructured, but even the scaled-down project failed at the time to achieve most of its revised targets.

In the light of recent developments in the sector, however, the project may have been more successful than it appeared earlier. First, the agriculture sector has experienced impressive export growth, and the sector itself has shown reasonably good average growth rates throughout 2000s despite drought during the 2001–02 season, suggesting that the investment program perhaps had some positive lag effects. Second, on sustainability, the investment program created the Agricultural Consultative Forum, (which is still active and is one of the leading think tanks facilitating policy dialogue between the Ministry of Agriculture and sectoral stakeholders. Third, the Rural Investment Fund, the largest component of the investment program, is still active and continues to facilitate investments into rural infrastructure. Recent field visits by World Bank staff have reportedly shown that many infrastructure facilities (such as small dams and storage facilities) built under the fund but dormant during the early 2000s are coming back to productive use and some, such as small-scale irrigation plans, are being further developed by local communities. Finally, the Agriculture Sector Investment Program managed to scale down the Ministry of Agriculture and focus it on core functions, although the fertilizer subsidy programs and maize market interventions have recently crowded out the agriculture budget for core functions.

After serving two terms, President Chiluba was not eligible to stand for reelection in 2001, and he was succeeded by Levy Mwanawasa. Both were from the same political party and there have not been any dramatic shifts in policy in recent years. The macroeconomy has continued to improve, and real GDP growth remained above 5 percent per year over the last five years, from 2003 through 2007. In 2006 and 2007, real GDP growth was 6.2 and 6.3 percent, respectively (IMF 2008).

The Mwanawasa government has made a few positive steps to address criticisms of the weaknesses and inconsistencies of the agricultural liberalization to date and has also taken some backward steps. On the positive side, it has acceded to the arguments opposing the formation of a Crop Marketing Authority (see, for example, Nijhoff et al. 2003) and has accepted that intervention should be limited to the more restricted roles established for the Food Reserve Agency. On the negative side, the government used a tariff review in 2005 to raise border tariffs on agricultural goods¹⁸ and continues to hold down private sector involvement in maize marketing by continuing panterritorial pricing and procurement and by injecting uncertainty about the whether export bans, tariff waivers, public sector import levels, and subsidies will be imposed when there is a maize shortfall.¹⁹

The main policy change has been to increase the level of maize and fertilizer subsidies. Producers have also benefited from a more certain policy environment. Despite the inherent policy inadequacies, the so-called “new deal” government has not made varied pronouncements during its tenure. Participants in the agricultural sector have thus learned how to deal with the inadequacies in a relatively stable environment largely free of the uncertainties associated with policy shifts.

Although the agricultural policy environment since 1992 has not been as open and growth oriented as had initially been expected, some notable positive changes have benefited small-scale farmers and poor consumers. Two sectors illustrate this point. First, removal of subsidies and other aspects of maize liberalization undermined the monopolistic position of the large milling companies, making it profitable for small hammer mills to produce maize meal. These are widely dispersed and often operate on a service milling basis, charging a fee for grinding maize grain that is brought to them by producers or households who were able to buy that grain or obtain it through food aid sources. Not only is the cost of the maize meal from hammer mills significantly cheaper than the commercial product—Jayne et al. (1999) estimate 20–30 percent cheaper—it is also (in its straight-run, or *mugaiwa*, form) more nutritious (Mwiinga et al. 2002). A 1997 study estimates that there were at least 5,000 hammer mills in the country, by that time providing a significantly cheaper source of maize meal while also employing 10,000 people. In addition, “the presence of the hammer mill has been reported to have stimulated increased crop production” (Temba 1997).

Second, in the case of cotton, the dissolution of the Lint Company of Zambia and its replacement by a variety of purchasers of seed cotton has been associated with a dramatic rise in the production of seed cotton (from 48,000 metric tons in 1993 to 144,000 in 2004, according to the Central Statistics Office). Unlike other export crops that grew rapidly in the 1990s (fresh flowers and sugar), cotton is primarily a small-holder crop. “Its potential role in poverty alleviation and food security is thus very large,” according to Tschirley, Zulu, and Shaffer (2004, page 1).

Neither of these positive developments is reflected in our NRA calculations. In the case of maize and maize meal, the data used is for commercial operations, while in the case of cotton the calculated NRAs are simply not consistent with developments in the sector. This may well be due to the monopsonistic structure of the industry.²⁰ After liberalization, the Lint Company of Zambia gave way to several cotton companies, but they operate in restricted areas and in effect are local monopsonists. This allows the Zambian cotton companies to sell inputs to farmers at cost, since they will receive any output and are assured of a profitable margin on the product side. The companies wanted to create order and predictability, which has paid off in increased production. Cotton and tobacco production also expanded because they were profitable relative to other crops. Maize production was adversely affected by the dissolution of NAMBOARD, and many small-scale producers reduced their maize areas and started growing cotton and tobacco (Tschirley, Zulu, and Shaffer 2004).

The unexpectedly negative NRA results since 1991 for most of the commodities studied (especially exportables) may also stem in part from the monopsonistic buying that is also evident in the cereal and oilseed sectors. Although there are many buyers of these crops, and not just a small number of big companies, the buyers nonetheless operate in specific localities, where competition is limited. Furthermore, the buyers are aware of the cash needs of farmers and therefore offer the lowest prices just after the harvest, accepting that somewhat higher prices will have to be paid later in the season, but knowing that the average for the year will be very low relative to border prices.

Market adjustment lags between domestic and border prices appear not only for small-holders but also in trades involving large-scale producers, even those using the Agricultural Commodities Exchange. In theory with perfect competition producer prices would rise to match border prices, providing strong incentives for increased production of the affected crops and hence rapid growth of the agricultural sector. This has not happened. To the extent that market imperfections affect prices, the difference could be labeled as a “market imperfection margin.” Assuming the most recent five-year period (2001–05) to be the most liberal, for Zambia the results suggest that this margin may have averaged, across all crops, as much as 30 percent gross or 25 percent net of input subsidies, even including a positive NRA for a major import-competing product (wheat). The market imperfection margin for exportables alone is estimated to be 39 percent.²¹

Prospects for Further Reform

In the last five-year period covered, all the NRA estimates for our covered products remain stubbornly negative, with the sole exception of wheat (see table 6.1). If the levels of distortion are to be reduced in the future, attention will have to be

given to both microeconomic and macroeconomic factors. The government needs to shift expenditure priorities in agriculture from short-term recurrent subsidies to long-term investments, to promote the development of competitive, private sector involvement in input supply and marketing, and to ensure a competitive exchange rate to enhance the profitability of traded agricultural commodities.

Government expenditure on agriculture is currently biased toward short-term, high-visibility expenditures that have obvious political payoffs but do nothing to overcome structural weaknesses in the agricultural sector. Thus of the K650 billion allocated to agriculture in 2006, over 30 percent (K199 billion) was for fertilizer subsidies. The current expenditure pattern varies greatly over time, and offers relatively low payoffs that depend heavily on rainfall. Other interventions would have lower and more stable returns. As concluded in a recent study on the poverty-reducing potential of small-holder agriculture, what is required is a comprehensive and holistic long-term approach to rural development, “not just an agricultural or commodity-specific strategy” (Siegel and Alwang 2005). Government expenditure should thus be directed to higher investment in agricultural infrastructure with a higher social impact such as roads, energy, water, telecommunications, and agricultural research and extension.²²

With regard to building the capacity of the private sector, the government needs to recognize that its own activities often undermine the private sector. In areas close to the rail line it should be profitable for the private sector to supply inputs and market production, but in practice private operators often find their efforts undercut by public sector provision of cheaper inputs or higher prices for crops. Parallel, subsidized delivery systems in the districts along the line of rail are suppressing commercial investments.

The government would do better to revert to targeting subsidies to areas that are difficult for the private sector to serve because of underdeveloped infrastructure and sparse populations. A recent study for the Food Security Research Project found that districts in which at least 25 percent of sampled households purchased fertilizer from commercial outlets were near the rail line. Subsidies could be provided to households in more remote districts by adopting incentive-based subsidy mechanisms, similar to those now commonly used in infrastructure sectors to leverage private sector capital and skills into serving remote areas. Under such output-based aid approaches, or “smart subsidies,” potential private operators bid to provide specified services, and the bidder requiring the lowest level of subsidy is given the tender. Mechanisms for monitoring implementation and penalizing nonperformance would be needed, however.

Finally, despite the liberalizations of the past 15 years and the consequent diversification that has occurred, copper still remains the lead sector in Zambia’s economy, particularly in terms of foreign currency generation. Currently, the key macroeconomic issues are the level and variability of the exchange rate. With the

reduction of Zambia's external debt; a resumption in confidence, as exemplified by foreign purchases of government securities; and a steep increase in the copper price (from \$1,560 a metric ton in 2002 to over \$8,000 in 2006), the nominal exchange rate appreciated 60 percent between June 2005 and June 2006—and the real appreciation was even larger. The exchange rate keeps moving, however, from K2,900 in mid-June, for example, to K4,000 to the U.S. dollar in mid-August of 2006. Appreciation of the kwacha and variability of the exchange rate pose significant threats to the sustainability of the recent achievements in increasing agricultural and other nontraditional exports.

As highlighted above, the government, with the support of the International Monetary Fund, is treating the appreciated exchange rate as a valid measure of the opportunity cost of foreign currency. In contrast, other major copper exporters, such as Chile, are attempting to limit the Dutch disease effects by building up offshore reserves, thereby sterilizing the impact in the local economy.²³ Sterilizing resource rents in boom periods to maintain a competitive exchange rate and promote alternative exports is one of the main recommendations that emerges from the literature on why so few resource-rich countries have performed better than resource-scarce ones.²⁴ As long as Zambia continues with a policy whereby the real exchange rate is effectively held hostage to the vagaries of the copper market, there will be continuous underachievement in the goal of economic diversification.²⁵

After the firm Anglo American withdrew from Zambia, the operators who took over the copper mines were given extraordinarily generous terms. At this juncture, the government is receiving virtually no taxes and no mining royalties. The main benefits of production to the economy are through employment and multiplier effects, both of which are limited in the mining sector. Without abrogating agreements, the government must investigate ways to increase its share in copper revenues.²⁶ Any additional resources from the copper sector should be used to build up infrastructure, human capital, and productive capacity in other sectors. Of these, the key sector is agriculture, where there is so much untapped potential and where the equity and poverty reduction benefits would be substantial.

Notes

1. The total land area of the country is 74 million hectares, of which 47 percent is suitable for agriculture; rainfall averages over 1,000 millimeters a year. Population density is only one person per 6.4 hectares (World Bank 2006; FAO 2006).

2. Values and growth rates that are not cited are from World Bank (2006).

3. Detailed analysis of changes in cropping mix among small-scale farmers is available in Zulu et al. (2000).

4. See papers produced by the Food Security Research Project (FSRP), a collaboration between the Agricultural Consultative Forum, the Ministry of Agriculture and Cooperatives, Michigan State

University, and the U.S. Agency for International Development in Lusaka. <http://www.aec.msu.edu/agecon/fs2/zambia/index.htm>.

5. This conclusion applies even to the effects of panterritorial prices. See later discussion in this chapter and Jansen and Rukovo (1992).

6. McCulloch, Baulch, and Cherel-Robson (2001); Balat and Porto (2006); Siegel and Alwang (2005).

7. There are reasons to suspect that the price variations in Kabwe were particularly large in the 1998–99 season; a main reason was that Food Reserve Agency imports were largely channeled to industrial millers and did not reach local markets. Much of the locally produced grain was probably sold early in the season because of farmers' cash needs. So with restricted supply and increased demand (to take to hammer mills), prices rose dramatically in the later months.

8. Year-by-year data are in appendix B of this volume, with further details in the appendix to Robinson, Govereh, and Ndlela (2007).

9. Jansen's full set of estimated nominal rates of protection for 1966–84 are given in table 7-7 in Jansen (1991) and are extended for maize, cotton, and tobacco to 1990 in table 7 of Jansen and Rukovo (1992).

10. Given the many assumptions behind the RRA calculations, weight needs to be given to the direction of change from the NRA numbers rather than to the absolute magnitudes. In particular, the data on subsidies are not complete or consistent over the whole period. After 1990, subsidies throughout the economy were sharply reduced but in agriculture some subsidies were continued, particularly in 1992 and 1993, to counter the effects of the extreme drought. There was also significant support to the agricultural sector through the large Agriculture Sector Investment Project over the period 1994 to 2001. In the new millennium, subsidies to agriculture have been increased again, notably on fertilizers and other inputs.

11. Jansen (1991) cites a linear programming transport model exercise showing that transport costs increased 20 percent as a result of panterritorial pricing.

12. For details, see Jansen (1988).

13. For most of the time this was in operation, the surrender requirement on exporters was 50 percent of their export proceeds; the other 50 percent was sold at parallel market rates. These are the values used in the spreadsheet. The multiple exchange rate system was unwound in 1992 with full unification of the exchange rate by early 1993.

14. These issues are discussed in more detail in Robinson (2004).

15. More recently, floriculture and horticulture have experienced declines. Sugar, cotton, and tobacco have exhibited more sustained growth.

16. Between 1987 and 2003, the bulk of nontraditional exports were primary agricultural products (33 percent), floriculture and horticulture (23 percent), processed food (20 percent), and textiles (20 percent).

17. Specific examples of the government's stop-go approach and the resulting increasing intrusion of the public sector, have been documented in, for example, Jayne et al. (1999), Govereh et al. (2002), IMCS (2003), Mwanaumo et al. (2005), Siegel and Alwang (2005).

18. Using the Global Trade Analysis Project (GTAP) product classifications, between 2003 and 2005 the applied Zambian import tariffs have gone up as follows: paddy rice, from 4.6 percent to 15 percent; wheat, from 5 percent to 10 percent; cereal grains, from 4.8 percent to 12.4 percent; and oilseeds, from 4.5 percent to 5.6 percent (World Bank 2008).

19. Mwanaumo et al. (2005) document the significant direct costs involved in public sector delays in response to the 2005 maize shortfall (such as fourth-quarter imports costing \$256 and \$320 per metric ton, compared with \$210, and lower transport costs had the maize been purchased in June). That report also notes the indirect, long-term costs of intervention in preventing the emergence and expansion of a competitive private sector capable of reducing marketing costs over time.

20. This would not be unique to Zambia. See "Why Liberalization Did Not Lead to Price Competition in Zimbabwe," in Goreux (2003, Section 2.6).

21. The conundrum of negative NRAs after liberalization is even more difficult to explain to the extent that the kwacha arguably remained overvalued after the liberalization of the foreign exchange market, yet our NRA estimates assume it has been in equilibrium since 1992. The possibility that the kwacha is overvalued when it is “market determined” is denied by the IMF and the Bank of Zambia. However, when monetary and international reserve policies are taken into account, one estimate, for the period 1996–2000 suggests that the kwacha was 60 percent overvalued (Robinson 2004).

22. Similarly, Balat and Porto (2006) conclude that while expanded trade opportunities in crops such as cotton, tobacco, and hybrid maize offer the prospect of significantly higher rural incomes, these gains will not materialize without “complementary policies, like the provision of infrastructure, credit, and extension services”

23. “Coping with the Copper Boom,” *The Economist*, May 25, 2006.

24. See, for example, Reinhardt (2000); Auty (2001, 2004); and Esanov, Raiser, and Buiter (2004).

25. Kayizzi-Mugerwa (1991) uses a multisector general equilibrium model to show the complexity of the links in an economy subject to Dutch disease shocks caused by the dominance of copper. He also argues for a more competitive exchange rate but observes that “in practical terms, the size of the devaluation of the nominal exchange rate necessary to realize a favorable change in the real exchange rate might be politically unacceptable. Success thus depends . . . on the political work put into selling the adjustment package” (p. 862).

26. Certain tax concession periods for have now expired.

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ZIMBABWE

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Zimbabwe's agricultural history can be traced to the period dating from the 13th to the 15th century, when the country was known as the Great Zimbabwe under the Mhunumutapa Empire. In precolonial times, people relied on barter trade for goods and services offered by the trading communities, and production patterns were based on comparative advantage. Then, with the arrival of the first European settlers in the late 19th century, acquisition and control over land became the central factor underpinning the growth, maturation, and decline of agriculture in Zimbabwe. This colonial and postcolonial era can be divided into seven subperiods defined by major political and economic developments.¹

In colonial times, the country was initially ruled by the British South Africa Company, under a British charter (1890–1923), and subsequently by a white minority, to which Britain granted “self-government” in what was then called Southern Rhodesia (1923–53). These settler regimes deliberately created a dualistic system of agriculture, in which the European farmers were given exclusive rights to the best farmland, together with various forms of support and assistance, while the majority African producers were confined to areas much less suitable for agriculture and were subject to discriminatory policy measures designed to subordinate African agriculture. The areas in which Africans were required to remain were initially known as Native Reserves, but were subsequently referred to as Tribal Trust Lands (during the 1960s and 1970s) and as Communal Lands (after independence). In these areas, traditional communal land tenure prevails.²

* The authors are grateful for helpful comments from workshop participants, including Marianne Kurzweil and Ernesto Valenzuela. Detailed data and estimates of distortions reported in this chapter can be found in Ndlela and Robinson (2007).

As early as the 1930s, a small provision was made for African farmers to acquire land on a freehold basis, but the available land never amounted to more than 8 percent of the total land area. Almost all small-holders were confined to what are now communal areas. This fundamental structure, dividing agriculture between small-scale communal farmers and large-scale commercial farmers, remained intact and determined production patterns throughout the 20th century.

During 1953–63, the country was part of the Federation of Rhodesia and Nyasaland (now Zambia, Zimbabwe, and Malawi). With the federal government situated in Salisbury (now Harare), the Southern Rhodesian government had a dominating influence over the federation. When Zambia and Malawi achieved independence, the federation dissolved. The Rhodesian government tried to avoid pressures for majority rule through a unilateral declaration of independence (UDI) from the nominal colonial ruler, Britain, in November 1965. The international response to this illegal action was the imposition of trade and investment sanctions, which led to a “closed economy” environment that in turn stimulated a period of intense import substitution. The agricultural sector grew rapidly, diversifying away from the main export crop, tobacco, which was particularly hard-hit by the sanctions.

During the UDI period, nationalist forces intensified their struggle into a war of liberation that eventually sapped the resources of the UDI regime. The main focus of the struggle was the restoration of land to the African majority. Yet after independence was achieved in 1980, land reform proceeded slowly. Various resettlement “models” were tried in the early 1980s, but still few Africans were able to acquire land, even after the restrictive terms of the transitional Lancaster House Constitution expired in 1990. Pressure from various quarters for resolution of the land question resulted in the convening of a major international land conference in 1998. The proposals made at that time seemed to have the support of a wide cross-section of stakeholders but were rejected by President Robert Mugabe.

Had the 1998 proposals been implemented, an orderly land reform program probably could have been undertaken with relatively little disruption to agricultural production. That did not occur, however. Two years later, when the government lost a constitutional referendum in February 2000, a precipitous “fast-track” land reform program was implemented in a manner that has effectively decimated the agricultural sector. At the same time, perverse macroeconomic policies were imposed, with an acceleration of inflation to above 1,000 percent per year in 2006 and above 10,000 percent in 2007 (IMF 2008). The combined effect of adverse structural change and inflationary macroeconomic policies has been eight consecutive years of declining gross domestic product (GDP) since 1999, with the cumulative decline totaling about one-third of national output.

The decline in the agricultural sector since 2000 has been even steeper than the decline in the overall economy. Between introduction of the land reform program

in 2000 and 2002, the large-scale commercial sector shrank from 39 percent of the land area to 8 percent. White-owned commercial farms continued to be expropriated and reallocated to new owners in a discriminatory way, in a highly politicized environment. As a result, much of the land is now occupied by people unable to use it productively. Moreover, the perception of injustice in land access continues. Thus, despite the destruction of the agricultural base and much of the institutional structure that supported a highly productive agricultural sector, the “land question” in Zimbabwe still remains to be settled.

It is against this background that the agricultural distortion measures in this study are to be assessed. The data presented here are calculated for the period 1955–2004 and attempt to measure the divergence between prices actually paid and prices that would have prevailed in the absence of policy distortions. Those undistorted prices are estimated using trade parity prices, based on external border prices plus or minus the marketing margins that would prevail in a competitive market. With the exception of wheat before 1973, and to a lesser extent maize and cotton for some years in the early part of the study period, plus a very few other single-year values elsewhere in the time series, the nominal rates of assistance (NRA) for all the crops studied are found to have large negative values.

The high taxation of agriculture can be explained by three main factors: agricultural policies that have driven down producer prices, offset at various times to some extent by direct subsidies to agriculture; market imperfections, particularly monopsonistic buying practices, which deprive farmers of the returns they should be receiving; and macroeconomic mismanagement, notably a persistently overvalued exchange rate.

The highest rates of growth in the agricultural sector as whole came in the late 1960s and early 1970s. However, after independence the support given to the previously neglected small-scale farmers, coupled with subsidy policies that encouraged the marketing of maize and repurchase of maize meal, resulted in significant improvement in performance, with the communal sector becoming the dominant supplier of both maize and cotton. A particular focus of attention is whether the liberalization of agricultural markets, which occurred as part of a broad structural adjustment program in the 1990s, had a positive effect on the agricultural sector. It turns out that the calculated NRAs and the growth of agricultural GDP are hardly different from the rates registered before liberalization, although it should be noted that the averages for the 1990s include the adverse effects of the once-in-a-century drought that occurred in the 1991–92 agricultural season.

Before 1990, the taxation of agriculture can be largely attributed to direct interventions. After liberalization, indirect interventions explain the persistence of low prices for producers, including particularly monopsonistic buying of agricultural

outputs and credit market restrictions that prevent farmers from borrowing to pay for storage of crops to take advantage of higher prices later in the season.

In response to the steep decline in agricultural output following the 2000 land reform program, the government (mainly through quasi-fiscal payments by the Reserve Bank of Zimbabwe) provided huge levels of subsidies to farmers (equivalent, in 2004, to 19 percent of GDP). However, distortions in the overall economy mean that items such as subsidized fuel and credit are likely to have been used for highly profitable arbitrage purposes rather than for agricultural production.³

The crisis in the agricultural sector and the economy as a whole is politically induced, and until there is a political realignment, implementation of the comprehensive economic and social program that is so desperately needed will not be possible.

Agricultural Policy and Distortions before 1955

Zimbabwe's modern economy was built upon the land alienation policies that followed the country's colonization by white settlers organized by the British South Africa (BSA) Company in 1890. The primary motive of the colonization by the BSA Company was the pursuit of rich gold deposits, but failure to realize this original dream turned the company toward exploitation of the land and related agricultural resources. Already by the early 20th century, agriculture was being vigorously organized to provide food for commercial settlements, namely, mines and urban centers. By the beginning of 1900, three types of land categories were in existence: reserves set aside for the exclusive use by Africans; land alienated to mines and farms, sometimes occupied, sometimes in the hands of absentee land owners or companies; and unalienated land, which the BSA Company regarded as its own until the British Privy Council decision of 1918 conferred it to the Crown.

Between 1908 and 1914, the BSA Company pursued a so-called "white agricultural policy" to limit the African reserves with the intention of recovering the best land and making it available for European settlement (Palmer 1977, p. 80). The BSA Company's management of land rights was even more racially discriminatory than its charter specified, actively preventing Africans from acquiring land that by law should have been open for purchase by members of all races.⁴

The dual structure of land ownership was reinforced through the provision of government services. In 1908, the Department of Agriculture was reorganized to give technical support to white farmers. A land bank was set up in 1912 with a share capital of £250,000 (Palmer 1977, p. 89). Bank loans of up to £2,000 for the purchase of farms, livestock, and other agricultural equipment were made available to white farmers only. No loans at all were available to black farmers until 1945, when the land bank initiated a scheme of advancing credit to farmers in the

African Purchase Areas where freehold ownership had been allowed. These areas accounted for a very small proportion of farmland in the country, occupying a maximum of 8 percent of the total land area. Loans were not available to other African farmers, because of their alleged lack of collateral security.

The transition in 1923 from BSA Company rule to self-rule by the white settlers only reinforced dualism and ushered in further land alienations. The 1898 British order that “a Native may acquire, hold, encumber and dispose of land on the same conditions as a person who is not a Native,” which had not been enforced by the BSA Company, was formally rescinded by the new government of Southern Rhodesia at the recommendation of its 1925 Land Commission. The commission recommended that native Africans be allowed freehold ownership only in newly demarcated Native Purchase Areas. Selected African farmers were allowed to buy those plots, whose scale was much larger than could be farmed by a typical household. Those operations later became known as small-scale commercial farms.

The actions taken following the 1925 Land Commission prepared the stage for the Land Apportionment Act of 1930 and consequently also laid the foundations for the permanent division of the country into African and European areas. The Land Apportionment Act provided a legal foundation to confirm BSA Company practice and provide separate areas reserved for whites and blacks. In creating African reserves, the Land Apportionment Act not only prevented African farmers from becoming competitors to the white settler farmers, it also impoverished Africans to such an extent that the majority of adults would be compelled to work for white farmers in mines or farms (Ndlela 1981, p. 72).

African agricultural production was severely curtailed. At the beginning of the century, African sales of farm produce accounted for 70 percent of their total cash earnings; by 1932 the figure had fallen to 20 percent (Arrighi 1970, p. 216). A stagnant peasant agriculture within the framework of dualism in the economy had emerged as increasing numbers of black peasant farmers were evicted from the more-fertile lands and from the areas within easy reach of markets. This discriminatory and dualistic political and economic framework, especially with regard to land policy, was further entrenched under the Native Land Husbandry Act of 1951. And when the Land Apportionment Act of 1930 was superseded by the Land Tenure Act of 1969, all the main provisions of the former were confirmed.

Government interventions in marketing and prices came after dualism was established, and were triggered by a deep slump in Rhodesian cattle and maize prices that occurred in 1921–23. This slump had far more devastating effects than previous economic depressions. In 1920, African grain sales to “white” traders were estimated at 19,800 metric tons at 10 shillings per bag.⁵ In 1921, the average price had fallen to approximately 5 shillings per bag, at which prices sales of grain became uneconomic in many districts. There was a bumper harvest that year, but

only 43,000 bags (4,300 metric tons) were purchased from African peasant farmers, a drop of 78 percent in sales. A similar reduction was reported in sales of African cattle. From an estimate of at least 20,000 head of cattle sold in 1919 at prices on the order of £7 to £8, by 1921 the demand for African cattle had practically ceased to exist.

The collapse in prices and purchases from African farmers was not only a cyclical phenomenon but also a structural change driven in part by surpluses from areas reserved for white settler farmers. African farmers had been moved out of those areas to the more remote reserves, cut off from the rail line or other transport systems. Only 30 percent of the land assigned to Africans, but 75 percent of that allocated to Europeans, was within 25 miles of the railway line and therefore within reach of markets for agricultural goods in the towns and mines. From the early years of colonial administration, the policy was to locate the European farms close to the railway line so white farmers had easy access to the country's transport system. Peasant farmers located more than 40 miles or so from the rail line, by contrast, were cut off from markets. When railway costs were added, grain crops could not bear the costs of more than 15 miles of ox-wagon transport. Furthermore, what little could be produced and transported from African areas was worth little when it arrived in town, because those markets were now being served by produce from the more productive and conveniently located areas now being used by white settlers (Arrighi 1970).

Explicit price discrimination in product markets was introduced in 1931. White farmers had been calling for the establishment of statutory marketing agencies to stabilize and guarantee their producer prices during the 1920s. The sudden decline in world maize prices at the onset of the Great Depression added urgency to their demands, which were met with creation of the Maize Marketing Board under the Maize Control Act of 1931. Under the law all maize destined to be marketed in urban areas had to be sold through the board, except for sales between Africans in the same administrative area. The board's initial mandate was to operate a dual price system, keeping domestic consumer prices 30–50 percent above export values. A quota system allocated white producers preferential access to the local pool, in an amount just sufficient to meet local demand (Ndlela 1981, p. 164), with the remaining maize sold to the export pool at whatever prices could be realized in the world market.

A further step toward price discrimination came with the Maize Control Amendment Act of 1940, which introduced a fixed price to producers based on the estimated costs of production plus some profit (Yudelman 1964, p. 273). Procurement occurred preferentially in white-controlled areas. White farmers were further privileged through a bonus paid for all maize delivered to the maize board that had been grown under certain conditions of "sound" farming practices,

defined in a way that excluded almost all African farmers. Price discrimination worsened in the 1950s, when the few African farmers who did deliver grain were made to pay special marketing levies nominally intended to cover the cost of handling their crops.

The system of monopoly marketing and price discrimination developed for maize was extended to other crops after 1950, when the Maize Marketing Board was renamed the Grain Marketing Board (GMB). The GMB's mandate included controlling the purchase and sale of various products including sorghum (from 1950), groundnuts (from 1951), soybeans (from 1969), wheat (from 1970), and coffee (from 1971).⁶ Many of these functions were eventually scrapped during the opening up of the economy in the 1990s, but then reintroduced beginning in 2001.

Measuring the Extent of Price Distortions, 1955–2004

The main focus of this study's methodology (see appendix A of this volume and Anderson et al. 2008) is on government-imposed distortions that create a gap between domestic prices of farm products and what they would be under free market conditions. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market), but it also generates estimates of distortions in nonagricultural sectors for comparative evaluation.

More specifically, this study computes a nominal rate of assistance for farmers including an adjustment for direct interventions on inputs. It also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA).

The basis of the approach is a comparison between the prices actually received by producers (or paid by consumers) and the prices they would have received (or paid) had there been no policy distortions. This approach reflects the assumption that in small countries the relevant opportunity costs are reflected in the international border prices for the commodities, adjusted for nonpolicy price wedges such as transport costs, marketing margins, quality differences, and the like. Where actual import and export prices are available, these are used in preference to the alternative of constructing a synthetic border price from international commodity reference prices, adjusted for transport and related costs.

The import and export parity prices are converted to local currency terms at an equilibrium exchange rate estimated from the official rate and the proportion of export receipts traded on the parallel or sanctioned secondary market (when there were retention schemes for exporters) or the illegal (black) secondary

market for foreign currency. Almost all import and export transactions in Zimbabwe involving the main crops have taken place at the official exchange rate throughout the five decades covered by this study.⁷

The longest series of border prices is obtained from the trade volume and value data from the Food and Agriculture Organization's FAOSTAT database. Dividing value by volume produces aberrant unit values in years when volumes are small, so for those years we used either national trade data (when that was available) or the international commodity reference price approach—bearing in mind that much of Zimbabwe's agricultural trade is within the southern African region rather than to and from international ports.

The producer price and production data for maize, cotton, groundnuts, sorghum, tobacco, and wheat are available over the entire time period, mainly from the official Central Statistical Office (2005) and from individual researchers, notably Muir (1981b) and Masters (1994a, 1994b). Producer price and data are available for sunflower only from 1960 and for soybeans only from 1968, because these are relatively new crops. As many primary and secondary data sources as possible were consulted to build up the data series needed for the calculations, and it should be noted the figures available for any particular commodity and year are sometimes quite divergent.

Interpretation of the NRA and consumer tax equivalent (CTE) results presented here needs also to take account of several other issues that arise from the way the calculations have been made. First, the wholesale level was chosen as the point in the value chain where the ratios were calculated. We assumed that from 1955 to 1990, the wholesale level was constituted by the state marketing boards, namely, the GMB for maize and other grains covered in this study (groundnuts, soybeans, sorghum, sunflower, and wheat) and the Cotton Marketing Board for cotton. Tobacco's point of sale is calculated as the price prevailing at the tobacco auctions in Harare. The calculated NRA measures thus apply to farmers close to the depots and would be lower (which in almost all years means more negative) for farmers living away from the depots. This remained true even after independence, when the government did try to improve the position of small farmers in remote areas by extending the network of marketing board rural depots beyond the line of rail and introducing panterritorial pricing.

Second, attempts were made during the 1990–94 period to deregulate domestic markets for major crops, but less progress was made in the liberalization and demonopolization of imports and exports by the marketing boards. Although the GMB was completely deregulated by April 1994, it continued to maintain its monopoly on international trade and to provide the reference wholesale level prices. Then in 2000, the government reintroduced domestic controls, including the compulsory purchase of grain and tight control over transport of maize and other crops. Thus, except for the period 1994–2000, the GMB has consistently

exercised a statutory monopoly and monopsony over both domestic and international marketing of maize and other major grains.

Third, even during the 1994–2000 period, the GMB continued to set minimum guaranteed prices for farmers, and it is this minimum price that has been used in the NRA calculations. Farmers who were able to market their products on the free market would have received higher prices and hence have been subject to higher (less negative) NRAs than have been calculated.

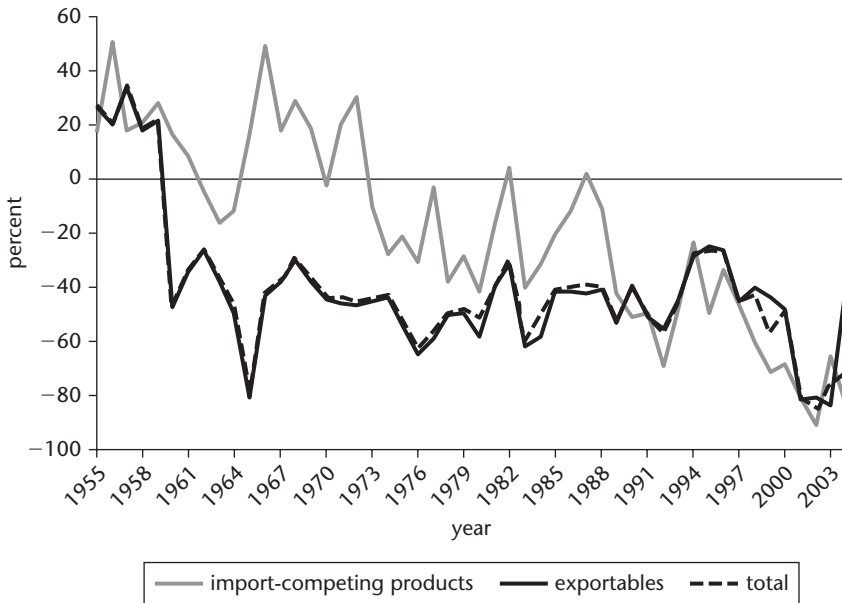
Fourth, in the case of seed cotton, those farmers who had received inputs from the Cotton Marketing Board were required to sell their crop through official channels, with a “stop order” system ensuring that any loan due from the input credit scheme was repaid. Initially following liberalization, some farmers tried to market their crop to freelance agents and ginners without repaying their loans; those farmers thus received higher prices than those used in the NRA calculations. Subsequently, since the inputs were typically subsidized and the interest rates were below the prevailing bank rates, most farmers preferred to market through the main cotton companies and thereby have access to inputs for the following season.

And fifth, for the CTE calculations, the GMB selling price to the millers has been used as the applicable wholesale price. Such prices are available only for maize, sorghum, soybeans, and wheat. The subsidies have been given through the marketing boards: the difference between the board purchase price from the farmer and the selling price to the processors, less the board’s operating cost margin. This difference indicates whether there is a subsidy to producers (positive difference) or to consumers (negative difference).⁸

Overall NRA pattern

The annual NRA estimates for import-competing products and exportables are illustrated in figure 7.1, while five-year averages for individual products are shown in table 7.1.⁹ Except for sunflower, which is assumed to be a nontradable and whose NRA is estimated to be zero, the NRAs are generally negative. Some commodities enjoyed brief periods of positive assistance: maize in the late 1950s; cotton in the early 1960s; and wheat from 1955 to 1974. The overall pattern, however, is one of negative assistance to agriculture after the 1950s. During the 1960s, the NRA for products covered in this study averaged –42 percent, then it worsened in the 1970s, 1980s, and the first half of the 1990s to an average of –47 percent (peaking at around –54 percent in the late 1970s). The negative NRA dropped back slightly to –40 percent in the late 1990s, before relapsing severely (to around –70 percent) in the 2000–04 period. In other words, farmers were taxed most heavily after the fast-track land reform program was implemented in 1998.

This overall negative pattern is the result of the interplay of a number of different influences. The direct influences arise from agricultural sector policies and the

Figure 7.1. NRAs for Exportable, Import-Competing, and All Covered Farm Products, Zimbabwe, 1955–2004

Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

nature and characteristics of agricultural markets, which are discussed in detail below. In explaining the changes in NRAs, it is not just the articulated policies that matter but also their implementation as reflected in the institutional structures, regulations, and financial flows (such as subsidies and public sector investments) to the agricultural sector.

The other main strand explaining the NRA pattern lies in the indirect effects of the macroeconomic and trade policies pursued by the government. Various aspects of these are discussed later, but it is relevant at the outset to stress that the main macroeconomic influence is through overvaluation of the exchange rate. Using the parallel market premium, the Zimbabwean dollar appears overvalued during most of the period under review, with heavy spikes immediately after the unilateral declaration of independence in 1965, and in 1976, 1983, 2001, and 2003 (Ndlela and Robinson 2007, appendix figure 3). The peaks for 1965 and 1976 do not include the full black market premiums, discounting the exchange rate movement that resulted from extreme capital account activity so as to leave only the rates applicable to current account transactions. The NRA values for years such as

Table 7.1 NRAs for Covered Farm Products, Zimbabwe, 1955–2004*(percent)*

Product indicator	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Exportables ^{a,b}	23.9	-39.4	-46.3	-45.4	-55.8	-50.0	-44.2	-44.3	-36.4	-66.7
Groundnut	-38.5	-50.1	-79.3	-74.8	-73.2	-68.7	-41.9	-49.5	-46.0	-80.9
Cotton ^c	-86.9	84.1	-27.5	-43.6	-56.6	-52.5	-47.8	-57.4	-36.3	-63.5
Tobacco	—	-42.7	-39.1	-45.7	-53.0	-45.7	-45.9	-37.2	-35.0	-66.0
Import-competing products ^{a,b}	26.8	-1.6	26.2	1.9	-24.6	-25.2	-17.0	-48.5	-52.5	-78.2
Wheat	26.8	33.7	56.6	15.0	-23.7	-11.7	-8.6	-47.3	-43.8	-76.6
Nontradables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sunflower	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed trade status ^b										
Maize	39.0	-5.1	-21.9	-22.3	-45.6	-30.8	-36.0	-49.0	-32.9	-62.9
Sorghum	—	-9.8	-16.5	-57.1	-38.6	-30.9	-36.8	-63.6	-74.3	-77.1
Soybean	—	—	-14.1	-28.5	-42.0	-42.2	-33.6	-48.5	-54.3	-68.4
Total of covered products ^a	23.9	-38.5	-45.5	-44.2	-54.4	-46.7	-42.7	-44.8	-39.9	-72.9
Dispersion of covered products ^d	78.4	73.1	56.2	36.9	27.7	28.1	24.4	25.2	27.3	33.9
Percent coverage (at undistorted prices)	71	71	66	59	52	52	56	55	53	53

Source: Data compiled by the authors.

Note: — = no data are available.

a. Weighted averages, with weights based on the unassisted value of production.

b. Mixed trade status products included in exportable or import-competing groups depending upon their trade status in the particular year.

c. The NRA for cotton for 1975–79 excludes 1977.

d. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

1965, 1976, and 1983 are more negative than surrounding years, because of a mirror image upward swing in the exchange rate premium.¹⁰

NRAs by commodity

The NRA for maize was -46 percent during 1975–79 (the height of the liberation war), -36 percent in 1985–89, and -49 percent in 1990–94 (see table 7.1). The NRA further worsened to -63 percent in 2000–04 (the height of the land reform program), notwithstanding unprecedented subsidies to the sector amounting to 19 percent of GDP in 2004). The other traded cereal crops (sorghum and wheat) have very large negative NRAs too, particularly in the 1990–2004 period. Among the traded oilseeds, the NRA for groundnuts is severely and consistently negative at around -75 percent during the UDI period (1965–79) and peaks again at -81 percent in 2000–04. Soybeans also are always negative and peak at -68 percent in 2000–04. The NRAs for the export cash crops, cotton and tobacco, tend to be negative, though less so than food crops, with cotton at -57 percent, -36 percent and -64 percent in the 1990–94, 1995–99, and 2000–04 periods, respectively. The tobacco NRAs have remained negative throughout the period under study and in certain years are even more negative than those for cotton (-39 percent in 1965–69 and -66 percent in 2000–04).

NRA for tradables and for agriculture as a whole

The NRAs for import-competing products were generally less negative than those for exportable farm products before the 1990s, and their average was actually positive at the start of the UDI regime under extreme import-substitution measures. During the late 1990s, the NRA for import-competing crops was even more negative than the NRA for exportables, which is unusual. In Zimbabwe's case the import-competing farm subsector is relatively small, and those food grains are considered essential for political stability, hence the provision of scarce foreign exchange at a low price to bring in what are effectively subsidized cereal imports.

The weighted average NRA for the commodities covered in table 7.1 (which account for between 55 and 70 percent of agricultural output over the 50-year period) is reproduced in row 1 of table 7.2. To that, we add our guesstimate of the NRA for the residual noncovered products. The elements of agriculture that grew most rapidly under the liberalized conditions of the 1990s—horticulture and export-oriented floriculture—did so in a relatively neutral policy environment. Most fruit and vegetables traditionally are for domestic consumption and are not traded internationally. We therefore assume the average NRA for all noncovered products is zero, and assume they are nontradables, which is true for most of the period studied. Then the weighted average NRA for all agriculture and for the tradable component can be estimated. These are shown in table 7.2 and

Table 7.2. NRAs in Agriculture Relative to Nonagricultural Industries, Zimbabwe, 1955–2004*(percent)*

Indicator	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRA, covered products	23.9	-38.5	-45.5	-44.2	-54.4	-46.7	-42.7	-44.8	-39.9	-72.9
NRA, noncovered products	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NRA, all agricultural products	16.9	-27.2	-30.8	-26.0	-28.6	-24.0	-24.1	-24.9	-21.2	-38.7
Trade bias index ^a	-0.01	-0.37	-0.58	-0.44	-0.40	-0.33	-0.31	0.13	0.42	0.83
NRA, all agricultural tradables	23.9	-38.5	-45.6	-44.2	-54.5	-46.7	-42.9	-45.2	-40.0	-72.9
NRA, all nonagricultural tradables	26.0	29.1	30.8	37.8	48.1	46.9	42.2	35.9	20.9	20.2
RRA ^b	-1.7	-52.3	-58.3	-59.5	-69.1	-63.4	-59.8	-59.5	-50.6	-77.3
Memo item, ignoring exchange rate distortions:										
NRA, all agricultural products	37.3	-32.9	-24.5	-27.7	-31.3	-23.9	-21.4	-31.6	-30.8	-46.2
Trade bias index ^a	0.10	-0.31	-0.40	-0.21	0.13	0.36	0.13	0.59	0.71	—
RRA ^b	9.4	-47.8	-41.3	-44.6	-48.4	-42.3	-40.5	-50.8	-47.0	-63.1

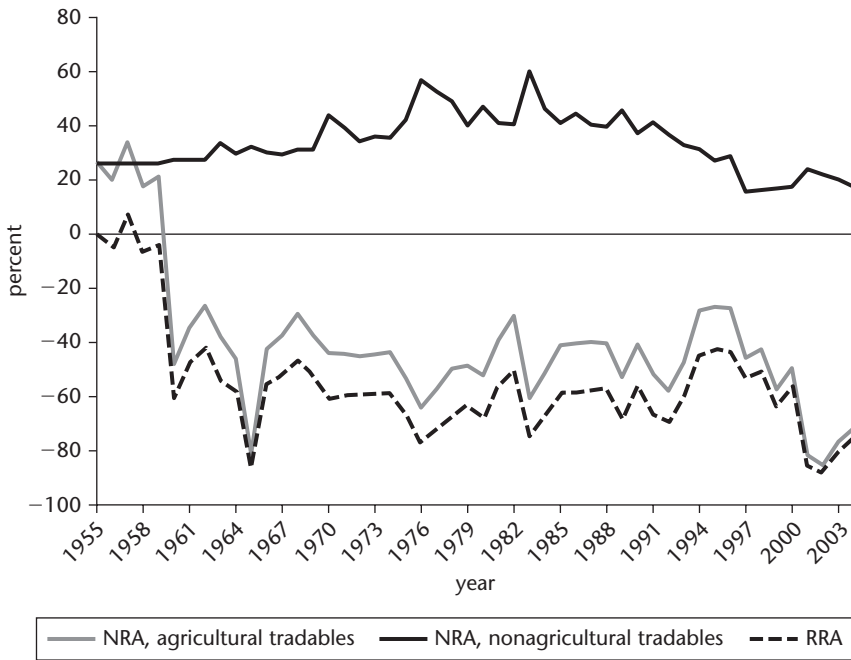
Source: Data compiled by the authors.

Note: — = no data are available.

a. Trade bias index is $TBI = (1 + NRA_{ag,x}/100)/(1 + NRA_{ag,m}/100) - 1$, where $NRA_{ag,m}$ and $NRA_{ag,x}$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

b. The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 7.2. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Zimbabwe, 1955–2004



Source: Data compiled by authors.

Note: For the definition of the RRA, see table 7.2, note b.

figure 7.2. Also shown there are the NRAs for nonagricultural tradables, based on import tariff protection rates and assumptions about the shares of import-competing production in the total value of nonagricultural tradables production. That NRA is positive, averaging between 20 and 50 percent, and so further dampened agricultural incentives, as indicated by the relative rate of assistance, which is even more negative than the NRA for agriculture.¹¹

Had the exchange rate not been distorted, the agricultural NRAs and RRA would have been considerably less negative (bottom rows of table 7.2), suggesting that exchange rate distortions have made a nontrivial contribution to the anti-agricultural and antitrade bias.

Policies behind the Distortions

To trace the evolution of distortionary policies in Zimbabwe, it is helpful to divide the period since 1955 into subperiods, with structural breaks after 1979, 1990, and 1999.

1955–1979

The Federation of Rhodesia and Nyasaland maintained the dualistic economy through land alienation and continued discrimination in labor and factor markets as well as grain marketing. By 1961, the proportion of land occupied by the African reserves (22 percent of the total land area) was the same as it had been in 1911. Forcible removal of Africans from elsewhere into these areas had started under BSA Company rule, and by the 1960s the reserves formed a vast patch of farms with irregular plots, a high degree of land degradation through soil erosion, sparse grazing, and depleted trees. Agricultural production in white controlled areas increased significantly during this period, however, and Zimbabwe (then Southern Rhodesia) was a significant exporter of maize (Muir 1981a). Domestic prices were kept above export parity through quotas on domestic sales, hence the positive NRAs for maize from 1955 to 1960.

Following the unilateral declaration of independence in 1965, the Rhodesian regime responded to international sanctions with extreme import-substitution policies and with even more intense discrimination between white and African farmers. Agricultural output increased strongly in the first decade of this period, by 13 percent per year in 1965–69 and by 22 percent per year in 1970–74. The real value of white farmers' agricultural output increased by 45 percent between 1965 and 1979 (Nziramasanga 1980, p. 39). Livestock production grew faster than crop production, with most of the increases after 1969 consisting of increases in the size of white-owned herds. The real value of African agricultural output, however, did not change significantly over this period, increasing by just 12 percent between 1965 and 1972 and thereafter declining to less than the 1967 level.

A key feature of agricultural policy after the universal declaration of independence was for white farmers to replace tobacco exports with even more maize production, further displacing African growers. The country's flue-cured tobacco exports had accounted for 22 percent of total world tobacco exports in the decade before UDI, during 1954–64, but fell sharply during the UDI period and represented only approximately 11 percent of total world exports by 1979.¹² Meanwhile, white farmers' production of maize increased markedly after 1966, spurred by government investment in new seed varieties, irrigation, and other services as well as by price policies.

In addition to the major crops that were controlled by parastatal organizations, a variety of noncontrolled products were regulated by producers' associations that had the power to levy fees on growers, set minimum quality standards, and regulate prices. The most notable of these were the Rhodesian Oilseeds Producers' Association, the Rhodesian Deciduous Fruit Growers' Association, and the Rhodesian Tea Growers' Association. An umbrella body for the farmers, the

Rhodesian National Farmers' Union, worked with the producer associations to improve the producer prices of products, especially those products produced by white farmers.¹³

In 1967, the government set up the Agricultural Marketing Authority to administer four statutory marketing boards, some of which were already in existence. The four boards were the GMB; the Cotton Marketing Board; the Cold Storage Commission (now the Cold Storage Company), responsible for livestock and meat products; and the Dairy Marketing Board, now completely liberalized as Dairibord Zimbabwe Limited for milk and milk products. The marketing authority conducted marketing research for different products, studied marketing channels, and advised the government on marketing policies.

Like the producers' associations, the monopolistic marketing agencies had the legal authority to levy fees on growers each year, to set producer prices, and to control imports. In addition, the Minister of Agriculture had the power to set the minimum auction floor price of tobacco as well as the production quota. In general, the crops in which Africans did not have a share of the market experienced rising prices, an indication of the success of the white-controlled producer associations and the national farmers' union.¹⁴ However, the large negative NRAs for all commodities during the UDI period (other than for wheat up to 1973) show that these institutions failed to raise producer prices above import or export parity levels.

In addition to the fundamental injustice of discriminatory land policies, many other measures continued to penalize African producers during the 1960s and 1970s. For example, special levies were charged on sales to the GMB by black farmers, which could be as high as 15 percent of the selling price. The money raised through these levies was paid to the Ministry of Internal Affairs' African Development Fund for use in the general development of the communal (African) areas. Quite like the GMB's procurement policies, the levy was a form of discrimination that worsened dualism in the produce market.

One mechanism by which white farmers enjoyed lower marketing costs was by delivering their produce directly to the marketing boards' depots, along the railway line. An initial payment was made to those farmers at the beginning of the harvest period, and the board paid out an adjustment at the end of the season based on market conditions. Most African farmers were ineligible to sell their produce directly to the marketing boards in this way. They sold their produce through approved buyers (agents), who in turn delivered it to the marketing boards.

The calculated NRAs are based on white farmers' prices and apply to producers close to the rail line. Our data should be seen as an upper bound on the actual NRA facing an average farmer and seen as clearly understating the negative incentives facing African farmers.

1980–1990

In the first 10 years after winning independence in 1980, Zimbabwe was characterized by a controlled economy and, in the sphere of land, by some piloting of land reform models. In 1982, the resettlement areas were introduced. These consisted of land originally purchased from large-scale commercial areas by the Mugabe government for resettlement of selected black farmers. Tenure in the resettlement areas was broadly similar to that of the communal areas, with open-access grazing areas and individually held cropping areas. By 1985, however, the resettlement program had run out of steam and concern rose over the government's neglect of land reform.

To stimulate agricultural production in the communal areas, extension services were greatly expanded in the early 1980s, and marketing services were extended into remote areas. Thus marketing operations before 1980 were mostly commercial and geared to marketing farm products produced mainly by large-scale commercial farmers; during the 1980s marketing operations were expanded to communal areas in response to government social and strategic goals. The GMB had both commercial and noncommercial roles. Its commercial roles related to the purchase, storage, and subsequent sale of agricultural produce to meet profitable market opportunities. Its noncommercial activities related to price support and stabilization activities, reserve food stock holdings, and provision of uneconomic depots as marketing channels for small-holder farmers and consumers in rural areas. The distortions behind almost all agricultural crops in the 1980s, where all NRAs were well below zero, arose from government's desire to maintain the multiple objectives of national food self-sufficiency, food security, low-priced food for consumers, and access to marketing channels for all farmers wherever they were located. This led to a set of policies combining higher domestic producer prices than prevailed in neighboring countries (but still well below border prices), subsidized consumer prices, accumulation and maintenance of strategic stocks, and an expansion of the depot network.

Subsidies were generally administered at two levels. One was through the trading accounts of the agricultural parastatals, mainly the marketing boards; the other was through direct payments to millers and processors. Most subsidies went to the marketing boards, and payments to millers peaked in fiscal 1982/83 (Cheliah 1986). Since colonial days, the government has been nominally committed to a cheap food policy for urban dwellers and the nonfarm workforce. The payment of explicit subsidies has mainly benefited urban consumers, who represent a relatively small share of the population (Ndlela, Kanyenze, and Munemo 1999). On balance, price policy operated at the expense of the poor majority in rural areas who are dependent directly or indirectly on agriculture for their livelihood.

1991–1999

Under the economic structural adjustment program launched in 1990, the government liberalized the previously tightly controlled economy. Price and interest rate controls were unwound, trade was liberalized, and some of the public enterprises, including the dairy and cotton marketing boards, were privatized and commercialized. The liberalization of the cotton sector led to wider geographical distribution of production, more provision of training and extension, and an increase in input credit, all of which had a positive impact on cotton production. In addition, a well-organized and efficient private seed company took over the production of cotton planting seed.¹⁵

After being controlled for more than 60 years, maize was decontrolled in 1994, allowing farmers to sell to whomever they chose. However, the GMB was not privatized like other parastatals and retained its monopoly over maize imports and exports. The decontrol period was short-lived; in 2000–01, the government reasserted control by passing a statute that criminalized the sale of most grains to any entity other than the GMB—even sales to a starving neighbor.

The shift in policy from the strict controls of the 1980s to the liberalized regime of the 1990s is not reflected in a change in the NRAs. That is largely explained by the pace and structure of the domestic liberalization in the marketing of grains, which left the GMB with a continued monopoly over international trade. During the brief period that domestic marketing of maize was liberalized, however, the structure of maize and maize meal markets changed significantly. The previously single-channel marketing system became a dual market, consisting of private and official segments.

After liberalization, the private sector consisted of farmers, traders, and hammer mills. These operated legally in noncommercial or communal farming areas starting in the 1992 marketing season and in commercial areas and industrial mills starting with the 1994 marketing season. The private segment of the market flourished in this partially deregulated environment, capturing an increasing share of maize and maize meal markets at the expense of the official market (represented by the GMB and industrial millers), which witnessed an erosion of its market share.

During the liberalization period, the GMB still operated under a political mandate to honor a fixed producer price for all farmers during the entire marketing season. Such panterritorial and panseasonal pricing relied on cross-subsidization and could not be maintained in a liberalized market, because private traders could always undercut the GMB in the most accessible markets and force the GMB to incur ever-larger transport and storage costs. Liberalization also made it harder for the GMB to defend preannounced prices, because volumes were highest in years when the GMB was most likely to lose money.¹⁶

The reform measures effectively reduced the GMB to a residual buyer or seller of maize (and other crops), depending on the relationship between the preset producer price and the price that emerged in the private sector. The GMB found itself in the unenviable position of having to purchase large maize surpluses even in normal years but able to sell maize domestically under exceptional circumstances such as drought. In the 1993–94 marketing season, which followed a good harvest, the GMB losses were estimated at Z\$1.4 billion, or roughly 4.6 percent of GDP, which was normally absorbed by the state treasury at taxpayers' expense.¹⁷

The massive fiscal cost of GMB losses in the early 1990s had a major impact on the government's ability to meet its other objectives. In particular, the objective of poverty alleviation was not achieved, because the bulk of GMB's purchases continued to come from large-scale commercial farmers rather than smallholders. In the 1990s, an average of 74 percent of the GMB's purchases originated from only 5 percent of all farms in Zimbabwe (Chipika 1994). In the 1993–94 marketing season, the major beneficiaries of GMB support prices were 1,360 large-scale commercial farmers and 4,470 small-scale commercial farmers (for more detailed information, see Collier and Foroutan 1996). In effect, access to the GMB limited the cost to these producers of the government's other policies. Even so, except for the years 1995 and 2000, the calculated NRAs that apply to farmers located close to GMB depots remained strongly negative.

When the domestic maize milling market was liberalized in 1993, consumers gained access to cheaper "straight-run" maize meal from local hammer mills, which quickly gained market share at the expense of the more processed products from larger-scale roller mills.¹⁸ Whereas 70 percent of urban households consumed roller meal in March 1993, only 23 percent did so by December 1993, with a commensurate rise in consumption of the straight-run meal. However, this shift depended on a supply of maize gain from the liberalized market outside the GMB. During the 1990s, most small-scale millers were eventually forced to close down because of the high costs associated with inadequate supplies of maize (Ndlela, Kanyenze, and Munemo 1999, p. 41).¹⁹

Low production of maize and other crops during the liberalization period was caused in part by price policy, but also by inadequate infrastructure and farm technology, particularly for communal areas. For example, the GMB had no maize input scheme similar to that provided for cotton, so it was very difficult for farmers to obtain fertilizer and seeds. Furthermore the liberalization coincided with a reduction of public resources for crop improvement research and extension. Negative NRAs for output were to some extent offset by subsidies to inputs, although in Zimbabwe there have never been generalized input subsidies. In particular, fertilizers were not explicitly subsidized, although there were fertilizer price controls that led to rationing and misallocation of fertilizer to areas other than the most

profitable ones (WTO 1995, p. 55). In-kind grants of both seed and fertilizer were periodically made to farmers, especially small-holders, as part of drought relief programs.

The most successful input supply program was the Cotton Inputs Scheme, which began in 1992 with the assistance of the World Bank. Under the scheme, the Cotton Marketing Board supplied cotton inputs on credit to growers, most of whom were small-holders, and the loan was repaid when the cotton was marketed. After the cotton industry liberalization in 1995, the cotton board's successor, Cottco (Cotton Company of Zimbabwe), was the only company that offered an input credit scheme. Farmers who had received Cottco inputs were then able to sell their output to other traders, who offered higher prices in part because they were not providing input credits, and in part because they accepted low-quality cotton without imposing Cottco's grading standards. Quality suffered, which in turn threatened to erode the high premium Zimbabwe cotton enjoyed in the international market (Goreux 2003, p. 16). This has not been solved, but a larger number of cotton ginning companies are participating in the input credit scheme to expand supply.

The monopsony position of cotton companies in purchasing from farmers goes a long way to explaining why large negative NRAs persist for cotton after liberalization (Goreux 2003). What is more difficult to explain is why high rates of negative assistance persist for other liberalized crops. One plausible explanation is that the monopsonistic buying that is evident in the cotton sector is also present in the cereal and oilseed crops sectors, where the buyers operate in specific localities in which competition is relatively limited. For the entire 1995–99 period, this “market imperfection margin” may have been as large as 36 percent across all crops, ranging from a low of 24 percent for maize to a high of 74 percent for sorghum. The kinds of policy change that would be needed to eliminate this tax on farmers involve greater competition among more diverse firms, and so would take longer to implement than most “stroke of the pen” reforms.

After 2000

After 2000, a dramatic deterioration in agricultural productivity occurred as a result of the fast-track land reform program, coupled with the effects of macroeconomic mismanagement which led to shortages of imported inputs such as fuel, seed, and fertilizer as well as the disruption of research and extension services, input supplies, and marketing systems. While the need for land reform was long overdue, the manner in which it was done was clearly never intended to solve the land question. As shown by the government's own land audits (Government of Zimbabwe 2003), ruling party stalwarts were given multiple farms while

millions of hectares lie fallow and farmers in all tenure systems have had to go without inputs year after year.²⁰ The fast-track land reform program involved wanton destruction of agricultural infrastructure, which subsequent massive subsidies have failed to address. The collapse of the agricultural sector, which had strong forward and backward links with other productive activities and commercial services, was a major contributor to the precipitous decline in the performance of the entire economy.

The fundamental agricultural policy change in the new millennium was the reversal of the 1994 decontrol of the maize market. In 2001, the government reclaimed control of maize and wheat marketing and criminalized any selling of maize by farmers even to their neighbors, let alone to independent market players. In an environment of accelerating inflation, the prices the government offered to farmers failed to take account of rapidly rising prices elsewhere in the economy. It is not surprising that by 2003 the NRAs of the major crops had fallen to all-time lows, on the order of -90 percent. Maize producer prices were relatively higher than those for other crops, though, with the maize NRA in 2003 at -44 percent.

Prospects for Reform

To say that the policies of the Mugabe government fall short of what is needed to address the deteriorating economic situation in Zimbabwe would be a gross understatement. The measures that are needed to stabilize the economy, such as strong fiscal adjustment, full liberalization of the exchange rate regime, and strengthening reforms for the agricultural sector, are a distant prospect.

The crisis in the agricultural sector and the economy as a whole is politically induced, and until such time as there is a political realignment that allows a bold change in policy direction, the economic outlook will remain bleak, with particularly detrimental effects on the poorest segments of the population. It is only political change that will allow the basic conditions for economic recovery to be restored. These include the reestablishment of the rule of law, including respect for private property rights, and the formulation and implementation of a comprehensive program to address the crisis in a systematic and internally consistent manner.

Political change is also a prerequisite for addressing the land question in an equitable and balanced fashion. A satisfactory solution to this issue is vital for the resolution of Zimbabwe's deep socioeconomic crisis. Once there is a regime change, the challenge will be for the authorities to implement a comprehensive package of macroeconomic policies and structural reforms to lay the basis for sustained growth, low inflation, and external viability. Overarching policies for the restoration of the agricultural sector will be needed—policies that are aimed at

restoring and enhancing the productivity of the sector as a whole, integrating different modes of production to overcome dualism, and reducing the historically entrenched distortions to agricultural incentives.

Notes

1. See Ndlela and Robinson (2007, appendix table 1 and, for the apportionment of land, appendix table 2).

2. From the beginning of colonial administration, native reserves (now communal lands) were set aside for exclusive use by Africans. These reserves were administered directly by the central government, albeit remaining “traditional” in that traditional leaders retained rights to allocate arable plots among local households, while grazing was open for those households. Methods of cultivation were similar to those used before colonialism, but with much higher population densities and therefore lower levels of production per person. See Riddell (1978, pp 6–11).

3. Gideon Gono, governor of the Reserve Bank of Zimbabwe, bemoaned this fact while increasing the levels of support to agriculture in a monetary policy statement issued in October 2005.

4. The BSA Company refused to sell land to leading Ndebele households, even though they could afford to buy it. The company also refused to sell land to the Fingo Community, migrants from South Africa who had been invited by Cecil Rhodes to settle in Rhodesia (Loney 1975).

5. This is equivalent to 198,000 bags, and each bag weighed 200 pounds.

6. Some other products were initially controlled and later removed from the controls list: beans in 1959, bulrush millet in 1962, and finger millet (*rapoko*) in 1965.

7. Over the study period (1955–2004), the average proportion of foreign exchange sold on the parallel market was 0.122. This figure rose sharply in 2002–03 (to 65 percent) and in 2004–05 (to 75 percent). During the five decades, official transactions for the main agricultural commodities took place at official exchange rates. Trading was the preserve of the GMB (for coarse grains including maize) and the Cotton Marketing Board/Cottco (for cotton seed and lint).

8. The largest recorded subsidy before hyperinflation set in was in early 2006, when the GMB purchased a metric ton of maize from farmers for \$31,200 and sold it to millers for just \$6,500. The potential profit of \$24,700 for each metric tone provided a huge incentive for the maize to be resold by the millers back to the GMB, a practice known as “round tripping.”

9. Year-by-year data are given in Ndlela and Robinson (2007, appendix table 8). The production shares of the crops covered by this study are shown in Ndlela and Robinson (2007, appendix figure 1), together with their tradability status (exportable, import-competing, or nontradable), while household consumption shares of the food crops covered are given in appendix table 2.

10. The exchange rate influence is evident in Ndlela and Robinson (2007, appendix figure 3). When calculated at the official exchange rate, the NRAs are less negative for most time periods and, for the 2000–2004 period, turn from negative to positive. See the bottom rows of table 7.2 in this chapter.

11. From 2004, large direct subsidies to agricultural inputs have been provided. Ostensibly, these subsidies are in recognition of the need to restore agricultural production following the chaotic land reform program. However, distortions elsewhere in the economy are such that many farmers divert the subsidies into direct profits (by selling subsidized fuel on the parallel market, for example) or into other channels (such as investing low-interest loans in financial markets). As a result, agriculture is not being revived by those direct subsidies.

12. Virginia flue-cured tobacco, which was grown almost exclusively by European farmers in the 1965–79 period, was a “controlled crop.” Its marketing was regulated by and controlled by the Tobacco Marketing Board, which in turn was under the umbrella of the Agricultural Marketing Authority.

13. After independence in 1980, the Rhodesia National Farmers’ Union became the Commercial Farmers’ Union and continues to represent the commercial farmers, while the majority of small and indigenous farmers are represented by the Zimbabwe Farmers’ Union.

14. For example, the Tobacco Association, which carried out tobacco surveys to document production costs and had a say in the minimum price, assisted the minister in setting minimum prices. Thus tobacco remained a profitable crop despite the economic sanctions.

15. The Cotton Company of Zimbabwe has interests in two seed producers, holding a 100 percent interest in Quton Seed Company, which produces cotton planting seed, and a 40.5 percent share in Seed Co Limited (listed separately on Zimbabwe Stock Exchange). It produces and markets maize seed and other crop seeds.

16. The GMB had no way of knowing whether farmers would deliver maize to its depots or to the private market after deregulation. If the producer price is not consistent with the private sector's valuation of maize, the GMB cannot compete effectively in a deregulated environment. By definition, the producer price announced before the start of the planting season could not be adjusted later to reflect market conditions. It is more than likely that the announced price would be at variance with the private sector's valuation of maize.

17. The GMB loss includes all handling, storage, transport, administrative, and financial losses associated with maize marketing.

18. Straight-run maize meal is referred to as *mugaiwa* in Zambia, and although not officially referred to by that name in Zimbabwe, *mugaiwa* is commonly used in Zimbabwe.

19. With the reintroduction of maize marketing controls and the demise of the small-scale hammer millers after 2000, Zimbabwean consumers are now back to consuming roller meal.

20. President Mugabe is on record as having said "It's clear we . . . have serious bottlenecks in the system of procuring and supplying inputs to our people now on the land. . . . The farmer prepares for the season diligently, only to be failed by the various arms of government." Closing remarks at his 2005 Party Congress at Esigodini, as reported by *Sunday Mail*, December 11, 2005.

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PART IV

EASTERN AFRICA

ETHIOPIA

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Over the past half century, Ethiopia has gone through three ideologically distinct political regimes: the monarchy, from 1950 to 1974; central planning (by the Dergue, meaning *committee*), from 1974 to 1991; and the regime that has been in power since the collapse of Dergue in May 1991.¹ Each shift in political regime has been marked by dramatic change in economic policies with direct implications for the agricultural sector both in access to factors of production and in marketing of inputs and outputs.

During the monarchy, the land tenure system was complex, private transfer of land was practically nonexistent, and ownership was skewed, with the state and the church maintaining control over large shares of agricultural land.² In fact, opposition to the land tenure system mobilized rural peasants and urban intelligentsia with the popular slogan “land to the tiller” and was one of the central forces that eventually brought down the monarchy in 1974.

After the 1974 revolution, the Dergue government introduced all aspects of a centrally planned economy. It nationalized rural land, abolished tenancy, ordered all commercial farms to remain under state control, redistributed lands, and maintained a highly overvalued currency.³ The most direct interventions fixed panterritorial grain prices, restricted private grain movements across regions, and set quotas for grain production (Lirenso 1987; Franzel, Colburn, and Degu 1989).

* The authors are thankful to Taddasse Kumu for sharing his data on the coffee and hides and skins markets, to Kassu Wamisho for providing various macroeconomic data, to Abera Birhanu for providing information on the chat markets, and to Alemayehu Seyoum for insightful discussions. The authors are also grateful for helpful comments from workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Rashid, Assefa, and Ayele (2007).

The outcomes of these policies are well known: economic growth was thwarted, farmers smuggled cash crops to neighboring countries (to circumvent highly overvalued exchange rates), and civil strife gained momentum. To make matters worse, a devastating famine hit the country in 1984. The problems became even more acute in the late 1980s, when Soviet assistance decreased and armed insurgencies in the north escalated. The Dergue eventually collapsed on May 28, 1991.

Following the fall of the Dergue regime, a transitional government embraced market-oriented economic policies. It adopted structural adjustment programs, abolished agricultural price controls, established macroeconomic stability, and emphasized agriculture as the priority sector in a strategy document called “Agricultural Development Led Industrialization.” According to many studies, the reforms paid off, but the country is still struggling to transform its agriculture.⁴ While the agricultural sector has registered an average annual growth rate of 1.7 percent since 1992, both production and prices continue to be more volatile than they are in most other developing countries, and the government has occasionally used public enterprises to intervene in agricultural markets to ensure price stability and an adequate distribution of inputs.⁵

This chapter traces the broad policies under the three different political regimes and examines how each affected agricultural incentives, economic growth, structural changes, and poverty over time. The chapter examines the trends in growth and structural changes across sectors and within agriculture; catalogs changes in agricultural pricing, taxation, and investment policies; and estimates the extent of distortions to agricultural incentives for selected commodities. The analysis itself covers the period 1981 to 2005 and generates estimates of distortions for eight commodities, which together account for about 80 percent of Ethiopia’s export value and about 60 percent of agricultural value added.⁶

Historical Overview of Politics and Economic Policies

The Ethiopian state originated in the Aksumite kingdom.⁷ It emerged as a trading state around the first century, with trading relations with the Byzantine Empire, Egypt, and the Arabic peninsula. Since then, Ethiopia has traveled a very long and troubled path in history which, in many respects, is unique in Africa. This chapter takes up the story starting in the mid-1950s when the monarchy, led by Haile Selassie, formulated the first five-year plan (1957–61) in the country’s history.

Three key messages emerge from the major political events and economic policies of the past half century. First, throughout its modern history, Ethiopia has suffered from political instability. Among other problems, the monarchy survived a coup attempt in the early 1960s and encountered strong insurgencies from the

Eritrean Peoples' Liberation Front and from the increasing discontent of tenant farmers and the urban intelligentsia. The first few years of the Dergue regime were filled with internal conflicts, violence, and bloodshed until Mengistu Haile Meriam came to power in 1977. Even then, however, the regime was constantly challenged by regional rebel groups, most notably the Eritrean People's Liberation Front and the Tigray Peoples' Liberation Front, which eventually forced Mengistu into exile in Zimbabwe in 1991. While the country has enjoyed relative stability in recent years, the current government has faced difficulties in the past and continues to face occasional civil strife. After Eritrea gained its independence in 1993, the tensions between the two countries continued. In May 1998, a dispute over the undemarcated border with Eritrea led to a war between the two countries that lasted until June 2000. More recently, following a disputed general election, political violence erupted in several places in June and November 2005.

Second, Ethiopia has embraced all dominant ideologies and associated economic policies since the mid-1950s. As part of its five-year plan, the monarchy adopted an export promotion strategy with an elaborate incentive package to attract foreign direct investment. When the economic outcome did not meet expectations, the government adopted a strategy along the lines of Prebisch-Singer import substitution, which the regime continued until its fall in 1974. The Dergue clearly embraced a socialist view of the world, imitating almost all aspects of economic management that the Soviet Union had developed. The current government adopted a more liberal approach, implementing many aspects of the World Bank–International Monetary Fund structural adjustment program, which included devaluing its currency and taking measures to establish macroeconomic stability. The reforms in the agricultural sector included removal of all restrictions on private trade, elimination of officially fixed prices, removal of compulsory delivery quotas, and abolition of grain rationing to urban consumers.

Finally, albeit with varying degrees, each regime has exerted some form of control over agricultural markets. The monarchy used two control mechanisms: large state ownership of land with very limited property rights; and control of international trade through state enterprises.⁸ The Dergue regime controlled almost all aspects of the agricultural markets: it outlawed private ownership of land holdings over 10 hectares, abolished rural wage labor, set production quotas and agricultural prices, and empowered state enterprises to control practically all aspects of agricultural markets (EEA 2000; Zewde 2002). The most pervasive distortion in Ethiopian agriculture during this regime was control over farmgate prices through the Agricultural Marketing Corporation, which imposed fixed prices and sales quotas that ranged from 50 to 100 percent of traders' turnover and from 10 to 50 percent of the farmers' harvest at prices consistently lower than market prices (Dercon and Lulseged 1995; McCann 1995).

After the fall of Dergue, the new government gradually eliminated many of the government controls. However, it supported 24 public enterprises in 2001, which incurred a net loss of Ethiopia Birr (Br) 51.5 million (equivalent to about US\$6.5 million) and reported a net retained earnings of Br -1.65 billion (or -\$19.1 million). In 2005, the number of public enterprises was reduced to 19, and the net loss declined to about Br 24.8 million (about \$2.8 million). However, the agricultural input marketing parastatals continued to dominate the markets. In 2005, the Agricultural Input Supplies Corporation controlled more than 80 percent of the market in improved seeds, chemical fertilizers, and pesticides.⁹

Over time, shifting economic philosophies and government control of farm production and prices have severely affected agricultural development in the country. The most direct consequence was perhaps the reduction of public spending on agriculture when public resources were diverted to finance wars and subsidize public enterprises.¹⁰ During the Dergue regime, expenditure on agricultural research, as well as on other social development, remained flat. Agriculture received more public funding than other social sectors, however, because agricultural expenditure included subsidies to public enterprises, which were a large part of total expenditure on agriculture. According to one study, between 1977 and 1990, state farms nearly quadrupled their holdings, from 550,000 hectares to 2.1 million hectares, absorbing 64 percent of all public expenditure on agriculture and accumulating a net loss of approximately \$300 million (Rahmato 1990; McCann 1995).¹¹

Economic Growth, Structural Changes, and Poverty

Since 1960, economic growth rates have varied significantly both across and within each of the three political regimes. Table 8.1 shows that during the monarchy, the economy fared relatively well compared with the other two regimes. Although per capita rates were negative in a few years, the overall growth rates in all three sectors were positive between 1961 and the monarchy's collapse in 1974. On average, GDP (gross domestic product) grew at 3.7 percent, agriculture at 2.1 percent, and both industry and the service sector at more than 7 percent during 1961–73.¹² The structure of the economy also changed. The share of agriculture in GDP declined from 76 percent in 1961 to 62 percent in 1973, and the shares of both industry and services grew by 3 percent and 11 percent, respectively.

The Dergue regime did more harm to agricultural production than the other two regimes. On average, the agricultural sector registered a little more than half a percentage point growth, and both total GDP and sectoral GDP suffered negative growth rates in a number of years. Overall GDP growth rates were negative in

Table 8.1. Economic Growth and Structural Changes, Ethiopia, 1961–2004

(percent)

Sector	Monarchy (1961–73)		Dergue (1974–90)		Current (1991–2004)	
	Growth rates ^a	Shares in total GDP	Growth rates ^a	Shares in total GDP	Growth rates ^a	Shares in total GDP
Total GDP	3.7	100	2.0	100	4.6	100
Agriculture	2.0	68	0.6	56	2.3	47
Industry	7.0	9	3.6	11	5.3	11
Services	7.3	23	3.8	33	6.9	42

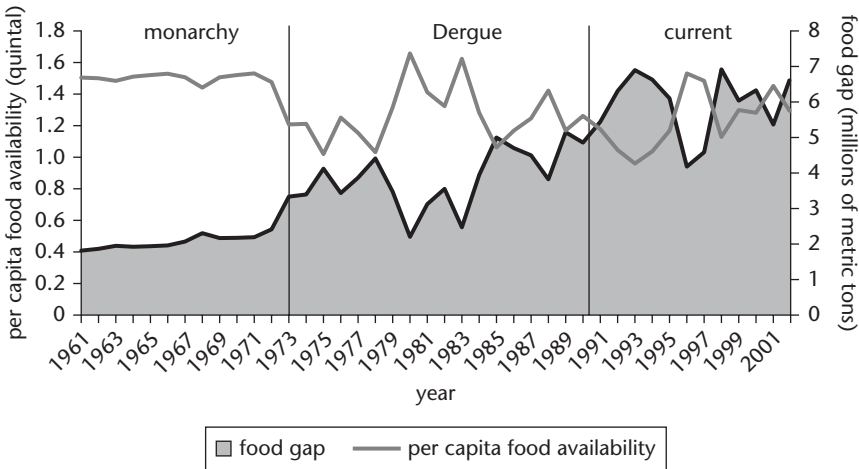
Source: Computed by the authors from various publications of the National Bank of Ethiopia.

a. Growth rates are calculated by fitting a log-linear trend.

9 years of the Dergue's 17-year rule, agricultural growth rates were negative in 11 years, and industrial growth in 7 years. Declines in growth rates of GDP and in the agricultural sector were as much as 12 percent and 15 percent in the mid-1980s.

The withdrawal of the government from agricultural markets in the early 1990s provided a much-needed boost to agricultural production and, given its large share of GDP, to the overall economy. Between 1992 and 2004, the country achieved an overall GDP growth of 4.6 percent per year, agricultural growth of 2.3 percent, industrial growth of 5.3 percent, and services growth of about 7 percent. The share of agriculture in the total economy declined from 56 percent in fiscal 1991/92 to about 42 percent in fiscal 2003/04.¹³ The most significant growth in agriculture took place in the early 1990s, mostly driven by expansion of crop area in response to liberalization, the strong emphasis on extension, and a credited push toward agricultural intensification. The growth slowed in the later part of the 1990s, however, and the country experienced large fluctuations in both production and prices. As a result, per capita agricultural GDP and per capita grain production continued their long-term decline, at -1.8 and -0.6 percent, respectively (Byerlee et al. 2006).

Economic growth and structural changes affect poverty and food security in complex ways, and assessment is hampered also by the unavailability of historical data on poverty. The World Development Indicators published by the World Bank have only two estimates of headcount poverty for Ethiopia, one for 1996 (46 percent) and the other for 2000 (44 percent). Similarly, the *State of Food Insecurity* put out by the UN's Food and Agriculture Organization (FAO) has information only for a few years. As an alternative, we use two crude measures, namely, food availability and the food gap, to assess changes in poverty and food security. (The food

Figure 8.1. Food Availability and Food Gap by Political Regime, Ethiopia, 1961–2002

Source: FAOSTAT, Ethiopian Ministry of Agriculture, and the National Bank of Ethiopia.

gap is defined as the population's basic food requirement of 220 kilograms of cereal per capita per year less net cereal production domestically.) These data are presented in figure 8.1.¹⁴ They indicate that the food gap has increased since the early 1980s but that per capita food availability has remained relatively stable over the years; that food availability was high and stable during the monarchy, and that despite relative stability and higher economic growth, food security has not improved under the current regime.

The generous inflow of food aid starting in the 1970s helped keep food availability relatively stable. Food aid averaged 388,230 tons a year during the Dergue and 715,345 tons a year during 1991–2002.¹⁵ The higher and more stable per capita food availability during the monarchy is consistent with the relatively stable economic growth observed during the period.

Why has food security not improved under the current regime, despite significant liberalization and relatively robust growth? A possible explanation may be that most of the cereals grown in Ethiopia are nontradable, and their production is largely weather dependent. Only about 10 percent of the total cereal cropland is irrigated, and yield variability at the regional level is one of the highest in the developing world (World Bank 2006; Rashid, Cummings, and Gulati 2005). Therefore, while liberalization resulted in positive supply responses for most cash crops, the cereal sector lagged behind. Without technological innovation and reduction in transactions costs, relative stagnation in cereals production is unlikely to change

in the near future. This is a reason for concern, as the cereals subsector is the largest employer in agriculture and accounts for about 50 percent of agricultural value added (GOE 1998). Indeed, a recent study concludes that growth in staple crops has the highest potential to reduce poverty in Ethiopia (Diao et al. 2005). Specifically, this study predicts that, between 2003 and 2015, annual growth of 2.1 percent in cereal yield combined with 1.3 percent annual expansion of the growing area would result in poverty reduction of 10 percent a year, with 3.9 percent annual growth in GDP and 3.5 percent annual growth in agricultural GDP.

To summarize, while each regime change is marked by heroic efforts of Ethiopians to embrace new ideas and policies, their livelihoods and well-being have changed little. The Human Development Index worsened between 1987 and 1996, the food gap increased from 0.75 million tons in 1979 to 6 million tons in the 1990s and early 2000s, and the country has become increasingly dependent on food aid to feed its populations (EEA 2004).

Measuring Distortions to Agricultural Incentives

The main focus of the current study's methodology (Anderson et al. 2008) is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in nonagricultural sectors for comparative evaluation.

More specifically, this study computes a nominal rate of assistance (NRA) for farmers that includes an adjustment for direct interventions in input markets. It also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables, through the calculation of a relative rate of assistance (RRA).

A large share of Ethiopian agricultural products is nontradable. This subgroup, which includes almost all cereals and tubers, accounts for about half of all agricultural value added. There are no subsidies (or taxes) on these products except for emergency food assistance and food distribution under social safety net programs.

However, the country has consistently received large volumes of food aid that influence the markets for these products.¹⁶ Given the significance of food aid in Ethiopia, we need to incorporate the effects on agricultural incentives of the government's decision to accept food aid.¹⁷ If the food aid depresses prices, it implicitly serves as both a consumer subsidy and a producer tax. We calculate the rate of that distortion as the product of the percentage change in cereal availability attributable to food aid and the inverse of the price elasticity of demand. Since food aid comes mostly in the form of wheat, we calculate the change in the wheat price by

using its own-price elasticity and the cross-price elasticity (with respect to wheat) for the other two key cereals, teff and maize. With this qualification, the formula in Anderson et al. (2008) for the NRA and the CTE (consumer tax equivalent) for nontradables becomes

$$NRA = CTE = \frac{\beta_i \times \eta_i^{-1}}{(1 + \varepsilon/\eta)}, \quad (8.1)$$

where β_i is the percentage change in total cereal availability and η and ε are the own-price elasticities of supply and demand, respectively.

Data and product coverage

Price and quantity data were collected from various local and international sources. Local sources include the National Bank of Ethiopia (NBE), the Central Statistical Authority (CSA) of Ethiopia, the Ministry of Agriculture, the Ministry of Finance and Economic Development, and the Ethiopian Economic Association. Although data for some variables were available from multiple sources, reconciling them was a difficult task. For instance, free on board (fob) prices for exports are available from a number of local sources as well as from the FAO, but the differences in any given year are as high as 100 percent. In general, we found NBE data on macroeconomic variables, CSA data on prices, FAO data on production, and the transaction costs data from the finance ministry to be more consistent across years. In years when differences were large, data from the most authoritative available source was used in the analysis. The policy review did not pose any significant problem, because most of the information was available from a government publication called *Negarit Gazeta*, which is often synthesized by the Ethiopian Economic Association.

The NRAs are calculated for five exportable commodities and three nontradable commodities that dominate Ethiopian agriculture. Although the country is a large recipient of food aid, commercial import (or export) of cereals is limited because of a large gap between the fob export price and the cost, insurance, freight, or cif, import price. According to various NBE publications, agricultural imports as a percentage of agricultural exports have ranged from 14.6 percent during 1986–90 to only 5.5 percent during 1993–2000. There is very little importing of commodities except food aid. On the export side, the analysis includes all five exportable commodities, which have historically accounted for more than 80 percent of total agricultural export values. Furthermore, the analysis includes the three major cereals, which are commonly regarded as nontradable and whose domestic prices have been depressed by the government's policy of accepting food aid from abroad, as explained using equation 8.1.

NRA results for agriculture

A summary of commodity-specific NRA estimates is presented in table 8.2. For the main products, the NRAs became more negative through the 1980s and early 1990s but have since turned less negative as a consequence of recent reforms. The exceptions that still have high negative NRAs are *chat* (a minor stimulant leaf from an evergreen shrub) and hides and skins, but they account for only about 1 percent of the value of agricultural production. The decline is most pronounced in the cases of coffee and pulses, which have received more policy attention since the late 1990s. The weighted average NRA of all commodities, both tradable and nontradable, also declined, and in 1995–2005, it was only two-thirds of the average for 1990–94 (–13 instead of –22 percent). This trend is consistent with the country’s liberalization program, which withdrew price controls and reduced export taxes in the mid-1990s and eliminated them by 2002. The trend for *chat* is different, mainly because it has always remained outside of parastatal control, and its export continues to be taxed at 29 percent.¹⁸ The lack of any change in the NRA for hides and skins may be rather surprising, particularly because a number of government initiatives have been designed to improve the sector.¹⁹

Table 8.2. NRAs for Covered Farm Products, Ethiopia, 1981–2005
(percent)

Product indicator	1981–84	1985–89	1990–94	1995–99	2000–05
Exportables ^a	–33.8	–44.9	–48.0	–40.0	–17.5
Pulses	–32.6	–56.3	–52.0	–35.1	–17.7
<i>Chat</i>	–52.4	–45.3	–45.1	–43.0	–39.5
Hides and skins	–46.9	–49.8	–51.6	–49.0	–48.4
Oilseeds	–43.3	–48.2	–57.2	–52.5	–40.1
Coffee	–28.5	–32.7	–38.5	–36.4	–6.2
Nontradables ^a	–5.6	–8.4	–9.3	–4.8	–5.5
Wheat	–6.9	–10.6	–11.8	–6.1	–4.4
Maize	–4.3	–6.6	–7.4	–3.8	–6.1
Teff	–4.9	–7.6	–8.5	–4.3	–7.0
Total of covered products ^a	–11.9	–15.0	–17.1	–9.7	–6.8
Dispersion of covered products ^b	26.4	28.2	28.0	29.1	20.6
Percent coverage (at undistorted prices)	61	60	60	59	61

Source: Data compiled by the authors.

a. Weighted averages, with weights based on the unassisted value of production.

b. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

Table 8.3. NRAs for Agriculture Relative to Nonagricultural Industries, Ethiopia, 1981–2005

(percent)

Indicator	1981–84	1985–89	1990–94	1995–99	2000–05
NRA, covered products	-11.9	-15.0	-17.1	-9.7	-6.8
NRA, noncovered products	-26.1	-33.4	-35.3	-29.5	-14.6
NRA, all agricultural products	-17.5	-22.3	-24.4	-17.8	-9.9
NRA, all agricultural tradables	-33.8	-44.9	-48.0	-40.0	-17.5
NRA, all nonagricultural tradables	40.2	51.3	44.5	20.8	11.1
RRA ^a	-52.6	-63.4	-63.8	-49.8	-25.8
Memo item, ignoring exchange rate distortions:					
NRA, all agricultural products	-10.2	-12.0	-13.5	-15.9	-9.9
RRA ^a	-27.3	-28.4	-29.6	-42.1	-25.3

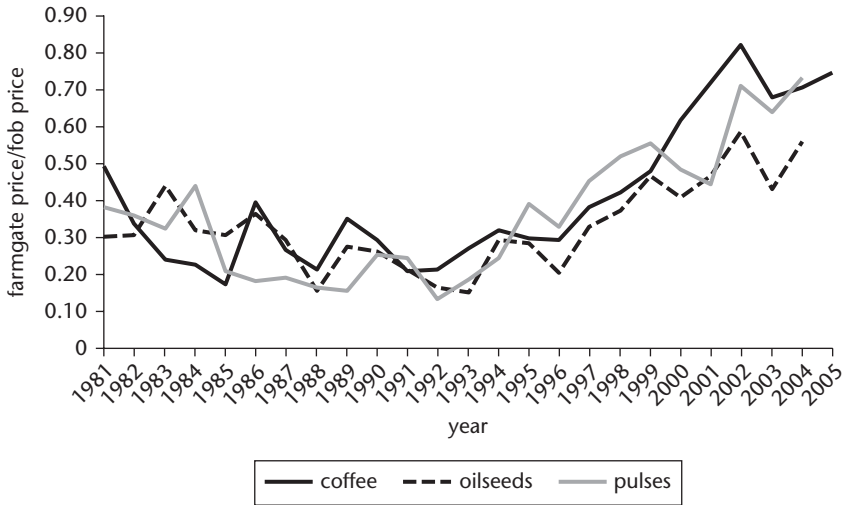
Source: Data compiled by the authors.

a. The RRA is defined as $100 * [(100 + NRA_{ag}) / (100 + NRA_{nonag}) - 1]$, where NRA_{ag} and NRA_{nonag} are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

To the NRA for covered products we need to add our guesstimate of the NRA for noncovered products. This is shown on the top of table 8.3. Non-product-specific assistance also could be included, but, as shown in table 8.3, we assume that to be zero. During the central planning regime, the government did provide farmers with inputs through parastatals. However, detailed data could not be obtained from official sources. In recent years, the government has been distributing fertilizers through cooperatives and extension offices, which enjoy some preferential treatment such as cheap credit and public warehousing facilities. Arguably, these are some forms of, albeit implicit, non-product-specific subsidies. However, one could also argue that these are essential interventions to address market failures, in which case they should not be included in the NRA calculations.

Although the overall trends of the NRA estimates are consistent with the country's policy changes, the magnitudes of the estimates need to be interpreted cautiously. First, the NRA estimates underestimate changes stemming from liberalization, because the parastatals' overhead costs during the Dergue regime are not factored in due to unavailability of data. Byerlee et al. (2006) report that seed parastatals' overhead for maize seed is as high as 65 percent of the sale price. If such costs were factored in for the 1980s, it would be clear that farmers were even worse off at that time than the NRA estimates for the 1980s suggest.

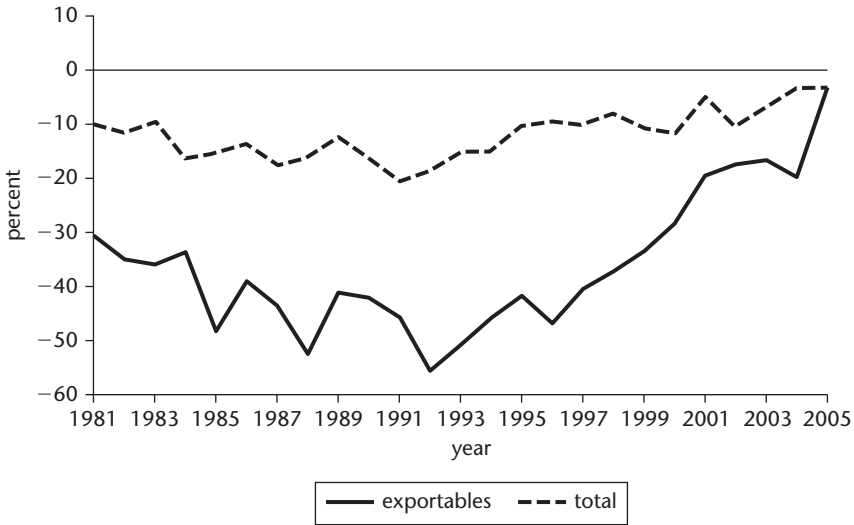
Figure 8.2. Farmers' Share of Export Prices for Coffee, Oilseeds, and Pulses, Ethiopia, 1981–2005



Source: Data compiled by the authors.

Second, because the government has almost completely withdrawn from the market, and because the NRAs account for all the costs (including traders' opportunity costs) from farmgate to the border, one might argue that the NRAs after liberalization should have been zero. Our data on transactions costs are less than perfect, however. For example, transportation costs in Ethiopia are notoriously unpredictable. Our interviews with traders indicate that transporting a ton of coffee from Sidamo (the main coffee-growing region) can vary from Br 400 to Br 750 within a period of 15 days. Furthermore, the trade margins that we obtained from official sources may be much smaller than those the traders and exporter actually incur.

Finally, although farmers' shares in the final sales price improved in the 1990s, they continued to remain low. Figure 8.2 shows the farmgate price as a percentage of the fob price for three products: the farmgate price of coffee in the 1980s averaged about 40 percent of the fob prices—and only 20 percent in 1985—whereas after liberalization, that share increased to an average of 53 percent, with a high of 80 percent in 2002. Similar patterns are shown for oilseeds and pulses. However, these numbers are still low relative to other countries. For example, Kenyan coffee farmers received about 87 percent of the fob prices (Winter-Nelson and Argwings-Kodhek 2007). The numbers for Ethiopia reflect the continuing weakness of the

Figure 8.3. NRAs for Exportable and All Farm Products, Ethiopia, 1981–2005

Source: Data compiled by the authors.

infrastructure and relatively high transaction costs—factors that the liberalization program has not changed.

Available calculations suggest that the wholesale prices of all three major cereals—wheat, maize, and teff—lie within the export and import parity bound (Rashid, Assefa, and Ayele 2007, appendix figures 3–5), which is why we consider them nontradable. According to our calculations, these products are much less heavily taxed than exportables, ensuring that the NRA for all covered products is far less negative than for exportables alone (table 8.2 and figure 8.3). However, these calculations do not consider the depressing effects of food aid on domestic cereal prices. Because food aid has accounted for roughly 25 percent of human cereal consumption, accounting for food aid affects would significantly change the figures. Our crude estimates suggest that food aid flows have depressed domestic prices within the ranges of 2–26 percent for wheat, 3–13 percent for maize, and 2–11 percent for teff.²⁰ These are conservative estimates, but they are large enough to change the tradability status of the cereals: all three cereals would become importable had these negative effects of food aid not depressed the Addis Ababa wholesale prices. This implies that food aid can distort incentives both for farmers (through depressing farm prices) and for traders (by distorting their

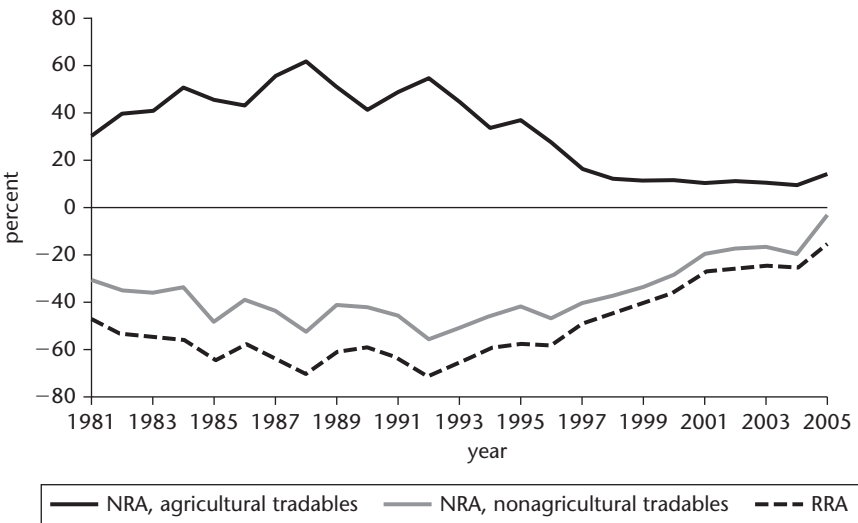
arbitrage opportunities in domestic and international markets). Thus if one took food aid as well as price and trade policies into account, one would conclude that farming has been discouraged even more in Ethiopia than our NRA estimates suggest.

RRA results

The estimates of relative rates of assistance (RRAs), which also account for distortions to other sectors producing tradables, are presented in table 8.3 and figure 8.4. Nonagricultural importables are subject to sizable tariffs, according to the World Integrated Trade Solution (WITS) database compiled by the UN Conference on Trade and Development (UNCTAD 2006). Using the ad valorem equivalent of those tariffs as a measure of the NRA for the import-competing part of nonfarm goods sectors, and assuming exportables are not distorted and that all services are nontradable, we obtain an NRA for all nonagricultural tradables and thus can calculate the RRA, as shown in the middle rows of table 8.3.

The broad picture that emerges is that the NRA for nonagricultural tradables rose in the 1980s as the NRA for agricultural tradables became more negative, so

Figure 8.4. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Ethiopia, 1981–2005



Source: Data compiled by the authors.

Note: For a definition of the RRA, see table 8.3, note a.

the RRA shows an even more accentuated fall than the NRAs for agricultural products in the 1980s and early 1990s. The RRA declined to below -60 percent, before growing gradually less negative after 1992; the RRA averaged around -25 percent in 2000–05 and just -15 percent in 2005. In other words, policy-induced distortions to farmer incentives in Ethiopia have declined significantly from their levels before the mid-1990s. The remaining challenges for the country, apart from bringing those NRAs and hence the RRA closer to zero, are to minimize distortions related to food aid and to reduce the still-high transaction costs of trade.

Policies behind Agricultural Disincentives

As in many other developing countries, exchange rate controls, prohibitive trade taxes, and agricultural price policies in Ethiopia have historically been the main sources of distortions to agricultural incentives. All of these have changed significantly since the early 1990s. This section summarizes the broad changes, relates them to the measures of distortions presented above, and identifies the areas that continue to dampen production and trade incentives.

Exchange rate policies

Until the introduction of the auction system in May 1993, Ethiopia had followed a pegged exchange rate regime, which was one of the most significant sources of distortion to agricultural incentives. Because the currency was highly overvalued, a parallel market for foreign exchange flourished. Between 1975 and 1992, the black market premium for foreign currency averaged 117 percent; at its highest in 1988, it reached 226 percent. One documented consequence was the smuggling of cash crops to neighboring countries, which reduced official export and foreign currency earnings.²¹

After the fall of the Dergue in 1991, the transitional government undertook a series of measures to realign the exchange rates, including devaluing currency by more than 100 percent (from 2.5 to 5.5 Ethiopian birr per US dollar), eliminating foreign exchange rationing, inaugurating foreign exchange auction markets in 1993, allowing commercial banks to open foreign exchange bureaus in 1996, and permitting foreign exchange trading between banks (GOE 2004). Under the current system, the National Bank of Ethiopia is the sole provider of foreign exchange, and only authorized banks and investors able to bid for at least \$500,000 are allowed to participate in the auctions, which occur weekly. The marginal rate determined at each auction serves as the official rate until a new rate is determined during the next auction.

The impact of the reduction in currency misalignment on agricultural incentives is nontrivial compared with the devaluation of 1993. The two bottom rows of table 8.3 show what the NRAs for agriculture and the RRAs would have been if exchange rate distortions had been ignored in our analysis; a comparison of these rows with the corresponding rows above them indicates that the distortions to the market for foreign exchange accounts for around one-third of the NRA for agriculture as a whole and for about half of the RRA. This contribution is larger than in many other countries, but that is partly because there are no large import-competing sectors in Ethiopian agriculture that were benefiting from an overvalued exchange rate.

Agricultural taxation policies

Heavy agricultural taxation in Ethiopia dates back to 1943, when an elaborate customs and export duties proclamation was issued (Cohen 1987; GOE 1999; Zewde 2002). The complex tax system was applied on the basis of quantity exported or imported. Taxation on coffee is a good illustration of the nature of the tax system, which was instituted in the mid-1950s and continued, with minor changes, until 1993. For each ton of coffee exported, an exporter had to pay Br 200 as custom duty, Br 400 as surtax, Br 15 as a cess tax, and a 2 percent (deducting other taxes) transaction tax. When added, all these taxes amounted to 11–27 percent of the farm-gate price in the 1980s. In addition to these taxes, the government also collected progressive taxes based on the international price of coffee. Converted to ad valorem rates at the official exchange rate, this tax ranged from about 1 percent when the international price was \$820 a ton to about 15 percent when the international price reached \$1,000 a ton.

Since 1993, the tariff structure has undergone extensive reforms. The government has issued a number of proclamations and regulations to revise and streamline the old tax system. These initiatives have brought about five distinct changes in policy. First, the former system of specific duties and taxes (weight-based) has almost completely been converted to ad valorem taxes, making tax administration much more efficient. Second, the maximum tariff has declined from a high 230 percent to 50 percent, and the difference between the maximum and minimum tariff has declined from 225 percent to 45 percent. Third, the proportion of duty free imports has declined from 60 percent to 3 percent. Fourth, the sales tax on both imported and exported goods has been reduced to 5 percent on essential commodities and to a uniform 12 percent on all other commodities (GOE 1999). Fifth, since 2002, the country's tax structure has been harmonized with those of fellow members of the Common Market for Eastern and Southern Africa (GOE 2003).

A 1993 proclamation replaced the complex tax structure for coffee exports imposed by the Dergue regime by introducing a flat 6.5 percent tax on coffee exports. That tax was then completely eliminated in 1998 following declining coffee prices in the international market. In 2002 the current government followed up by eliminating taxes for other exportable commodities. With these reforms, most exports are now free of tax. Of the commodities covered in this analysis, only *chat* remains subject to an export tax (29 percent). The elimination of export taxes has further boosted exports, particularly of oilseeds and pulses. Total export of oilseeds and pulses jumped from about 100,000 tons in fiscal 2003 to 184,000 tons in fiscal 2005. During the first half of 2006, total export earnings from oilseeds and pulses exceeded that from coffee, which has historically been the number one export crop in the country.

Agricultural policies on output prices

Ethiopia has experimented with a whole spectrum of agricultural pricing policies, ranging from parastatal-centric control through production quotas and trade control during the Dergue regime, to a dual-pricing approach during 1992–99, to total liberalization (except security reserve and safety nets) with ad hoc interventions since 1999. As a first step toward liberalization, the transitional government undertook substantial reforms in agricultural marketing in 1992, which included elimination of wheat subsidies, closure of all eight regional Agricultural Marketing Corporation offices, and a reduction in the number of branch offices from 27 to 11; the number of grain procurement centers was reduced from 2,013 to only 80 (Gabre-Madhin and Mezgebou 2006). Since then there have been five important government proclamations that highlight the shifts in policy objectives over time, three points about which are worth noting.

First, the Ethiopian Grain Trading Enterprise (EGTE), a downsized version of the former marketing corporation, was mandated to stabilize prices, maintain food security reserves, and export agricultural commodities to generate foreign currency. These are clearly conflicting mandates. While the involvement of a government agency in food price stabilization and the maintaining of food security stocks may be justified if there are market failures, it is not clear why the EGTE was mandated to also export in liberalized markets. Furthermore, non-tradable cereals can be exported only with subsidies. The policy turned counterproductive in 1997, when the EGTE exported 48,000 tons of grain at a subsidized price only to face the daunting challenge of managing domestic price hikes a few months later. The export transaction turned out to be unprofitable for the EGTE, because the export price was 15 percent lower than the domestic sales price (Bekele 2002).

Second, despite the 1997 export experience, the policy of export promotion continued as a central mandate of EGTE. In 1999, the EGTE was merged with another public enterprise, Ethiopian Oilseeds and Pulse Export Corporation, to consolidate public export functions into one agency. Although the private sector dominates exports of oilseeds and pulses, the EGTE continues to have a large export share, despite having much larger marketing costs than the private sector.

Third, there are indications that the absence of food price stabilization and the ad hoc pricing policy are sending mixed signals to the producers. Two recent examples can substantiate this statement. Two consecutive years of bumper harvests of maize and other crops resulted in a precipitous 80 percent decline in producer prices of maize in early 2002. As the ratio of input prices to maize prices increased from 1.7 in 2000 to 9.0 in 2002, maize production became a highly unprofitable business. This led farmers to abandon their maize crop in the field and reduce their fertilizer use by up to 20 percent. Low rainfall the following year led to a dramatic drop in maize production and skyrocketing prices. The second example is more recent. In January 2006, at the time of Ethiopian Christmas and other religious festivals, cereal prices rose more than 20 percent above their levels in the previous months, and the government announced a temporary ban on exports.

To summarize, while extensive reforms have been introduced to dismantle the policies of the central planning regime, a large public agency continues to operate with conflicting mandates. Export promotion, in most cases of nontradables, continues to be an important mandate for the EGTE even in the most recent government proclamations. This is very different from the rural and agricultural development policies adopted elsewhere in developing countries, where food self-sufficiency came before export promotion and the policies focused, among other things, on ensuring price stability and giving proper incentives to farmers to adopt best-practice technology (Rashid, Cummings, and Gulati 2005; World Bank 2006; Byerlee et al. 2006).

Farm input market policies

Modern use of farm inputs is limited in Ethiopia. Available estimates suggest that Ethiopian farmers apply about 16 kilograms of nutrients per hectare of cultivated land (EEA 2005), and only 3 to 5 percent of farmers use modern seeds (Byerlee et al. 2006). A host of factors—such as limited irrigation facilities, weak dissemination, and suitability of these inputs—is responsible for low adoption of modern seed and fertilizer technology. However, government policies toward input markets, which are heavily controlled by the public sector, might also be a contributing factor. The following reviews the public policies toward the two most commonly used modern inputs in the country, fertilizer and improved seeds.

Between 1984 and 1993, government parastatals had monopoly control over fertilizer importation, distribution, and pricing. In 1993, the government issued its National Fertilizer Policy, which allowed the private sector to participate in fertilizer imports and distribution. A few importers and several wholesalers and retailers entered the market, but two years later the government decided to create regional holding companies with strong ties to regional governments (GOE 2001). This policy created disincentives for the private sector, because the government provided the parastatal holding companies preferential access to foreign currency to import and distribute fertilizers under the New Extension Intervention Program. By 1996, this program accounted for 67 percent of the country's fertilizer distribution, with the holding companies being awarded virtually all of the fertilizer supply contracts (Stepanek 1999). This preferential treatment, along with subsidized storage and transportation to the holding companies, discouraged the private sector and forced many companies to exit the market. As of 2001, two regional holding companies and the parastatal Agricultural Input Supplies Corporation accounted for all fertilizer imports and local distribution (Jayne et al. 2003). Since 2004, though, farmers' cooperatives and unions, which enjoy preferential access to credit, have emerged as buyers and distributors of fertilizers.

The modern seed sector in Ethiopia is dominated by the Ethiopian Seed Enterprise (ESE), especially for hybrid maize and wheat. The only major competitor is Pioneer Hi-Bred, an international company that is involved in the production and marketing mainly of maize seed, including both hybrid and open pollinated varieties (OPVs). According to a recent government report, ESEs produced 82 percent of all hybrid maize seed used in the country and 70 percent of the OPV seed. Furthermore, although some private firms and farmers multiply seeds under contract arrangements, only ESE and Pioneer carry out the marketing and distribution (Alemu and Spielman 2006). The dominance of ESE in an arguably liberalized market is not clear, particularly because available data suggest that the marketing of improved seed production can be lucrative. The failure of private sector firms to emerge in the country's seed industry can perhaps be explained by the preferential treatment that ESE is granted for its operation.

Summary and Implications

With three ideologically distinct political regimes, Ethiopia has embraced all major waves of economic policy thinking over the past 50 years. It pursued export promotion in the 1950s, Prebisch-Singer import substitution in the 1960s, central planning during 1974–1991, and primarily market-oriented policies since the early 1990s. This chapter has provided a critical review of the country's broad

economic policies since the 1950s as well as time series estimates of rates of distortion to agricultural incentives since 1981. The review suggests that policies of all political and policy regimes distorted agricultural incentives, albeit to varying degrees. The monarchy controlled land and exports of cash crops; the central planning regime controlled almost all aspects of agricultural markets; and the current regime, which has implemented substantial reforms, continues to intervene in output markets through ad hoc policies and input markets through marketing parastatals.

The estimates of assistance and taxation are in line with the broad environment under each political regime. High taxation and an overvalued currency resulted in high nominal and relative rates of assistance in the 1980s compared with the 1990s. The estimates also suggest that even though farmers were heavily taxed in the 1980s, the government did not generate revenues in real terms because of the parastatals' high overhead costs and an overvalued currency.

Currency devaluation, abolition of price controls, and the streamlining of tax systems have resulted in significant declines in the rates of distortion since the mid-1990s. The improvement in agriculture's NRAs and RRAs has contributed to an increase in the volume of exports of all major exportable farm commodities. However, although farmers' share of the fob prices increased in the 1990s, those shares remain low compared with those in neighboring countries. Our analysis also suggests that three forms of distortions in agriculture still persist: control over input markets; ad hoc government interventions in output (mainly cereal) markets; and disincentives through depressed prices, caused by the continued inflow of food aid.

Is the current situation likely to improve in the future? There are reasons to be optimistic. Ethiopia is now in the process of accession to the World Trade Organization, and may therefore have to withdraw from the farm input markets and stop intervening in the farm output markets. The government of Ethiopia has also placed more emphasis on developing infrastructure and market institutions (commodity exchanges are in the making) and on designing more effective social safety net programs. If these initiatives are successful, and political stability is maintained, agricultural incentives may well improve further in the future.

Notes

1. The monarchy started earlier, but the country adopted its first five-year plan in 1956; following the revolution in 1991, a transitional government held power until 1995.

2. For example, in the southern part of the country, agricultural lands were equally distributed among the state, churches, and the local people. Tenancy rates ranged between 65 and 80 percent of landholdings, and the tenants' payments to landowners reached as high as three-fourths of total production (Zewde 2002; Cohen 1987).

3. For further details on the policy actions and their consequences, see Zewde (2002) and McCann (1995).

4. Many studies have documented the impacts of policy reforms, notably Negassa and Jayne (1997); Dessalegn, Jayne, and Shaffer (1998); and Gabre-Madhin (2001).

5. One recent intervention was an export ban on cereals in the wake of increasing prices in February 2006.

6. The numbers are based on a new social accounting matrix developed at the International Food Policy Research Institute in Addis Ababa.

7. This section draws from Zewde (2002) and McCann (1995).

8. In the southern part, the state and the church owned two-thirds of the land. The northern part had nontransferable communal kinship ownership, which it wanted to protect and so waged a defensive struggle against the government's land privatization policy. Furthermore, the government made extensive land grants to its supporters—the military and public officials—in order to broaden its power base (Cohen 1987; U.S. Library of Congress 2004). Zewde (2002) reports that the first public enterprise in Ethiopia, called the Ethiopian National Corporation, was established in early 1942 by the Ministry of Commerce and Agriculture to control exports; this public corporation was succeeded by the Coffee Board, the Livestock and Meat Board, and the Grain Corporation, designed to control the three most important agricultural commodities.

9. Preliminary calculations based on data from the Ethiopian Seed Enterprise and the Agricultural Input Supplies Enterprise.

10. Rashid, Assefa, and Ayele (2007, appendix figure 1) present public expenditures, as a percent of GDP, for various sectors during 1981–2003. The upward trend in defense expenditure clearly corresponds with the years of civil strife. In the 1980s, defense expenditures accounted for 7–11 percent of GDP. Defense spending came down to about 2 percent after the fall of the Dergue but picked up again during the war with Eritrea.

11. Unfortunately, continuous time series data on public subsidies are not available.

12. Detailed time series data are presented in Rashid, Assefa, and Ayele (2007, appendix table 2).

13. Calculated from Rashid, Assefa, and Ayele (2007, appendix table 2).

14. Detailed data are presented in Rashid, Assefa, and Ayele (2007, appendix table 3).

15. Food aid figures are calculated from World Food Programme data reported in FAOSTAT. No data are available for the monarchy period, but food imports averaged only 28,068 tons a year from 1960 to 1973.

16. It amounts to about 13 percent of cereal utilization, which is equivalent to about 25 percent of total human consumption (where in addition to human consumption, cereal utilization includes seed, feed, and waste).

17. A number of studies have analyzed the disincentive effects of food aid flow and come up with very different conclusions. While Abdulai, Barrett, and Hoddinot (2005) argue that food aid had no adverse impact on agricultural incentives, Demeke, Guta, and Ferede (2004) find significant negative effects, both indirect (through depressed producers price) and direct (through reduced production).

18. In fact, because of its addictive effects, governments in the region (Ethiopia, Somalia, and Djibouti) have tried to prohibit *chat* cultivation at various points in time, but without much success.

19. The government of Ethiopia, with financial support from the U.S. Agency for International Development, is currently implementing a large multiyear, multi-million-dollar project to improve the sector's performance.

20. These estimates are sensitive to the price elasticities used in the calculations. However, food aid seems to depress price under a wide range of elasticities. For our calculations, we have used an estimate of -0.50 for own-price elasticity of wheat and 0.8 and 0.7 for cross-price elasticities of maize and teff, respectively. These are based on estimates provided by Alemayehu Seyoum of Addis Ababa University.

21. On coffee smuggling and supply responses, see Dercon and Lulseged (1995).

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KENYA

*Alex Winter-Nelson
and Gem Argwings-Kodhek**

At independence in 1963, Kenya inherited a relatively open and export-oriented economy with a policy environment that was favorable to the agricultural sector. Unlike many other developing countries, the ruling elite in Kenya had strong links to agriculture and implemented policies that supported both small-holder and large-scale producers. For most of the next 20 years the agricultural sector thrived, the economy in general grew, and the country enjoyed political stability. In contrast, the second 20 years of independence were marked by agricultural and economic stagnation and persistent struggles with corruption and other forms of poor governance. In recent years, both agriculture and the economy generally have shown signs of recovery and growth.

This chapter first reviews major developments in the structure of the Kenyan economy and summarizes economic policies up to independence. It then presents measures of policy-induced price distortions over the 1963–2004 period. Distortions are measured using estimated rates of assistance based on comparisons of domestic commodity prices with undistorted world market prices. Finally, the paper links changes in rates of protection to the evolution of various policies over the same period.

From 1965 to 1981, Kenya's real GDP (gross domestic product) per capita rose at an average rate of 2.5 percent a year while agricultural value added grew at an annual rate of almost 5 percent.¹ During this period, the state presence in the economy expanded: the prices for most agricultural commodities were administered by

* The authors are grateful for helpful comments from workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Winter-Nelson and Argwings-Kodhek (2007).

marketing boards, and trade was restricted through import licensing regulations. Nonetheless, for the first 20 years of independence the agricultural sector was spared high direct or indirect taxation as measured in the nominal rates of assistance (NRAs), except during a few periods of exchange rate distortion.

After this promising start, growth in agricultural production and in per capita income faltered in the early 1980s and stagnated until after 2004, when performance improved markedly. Slow growth in income was paralleled with rising rates of poverty. In 1982, the rural head-count poverty rate in the country was 48 percent, ranging from 26 percent in the agriculturally rich Central Province to 58 percent in Nyanza Province. Ten years later, the average rural poverty rate was unchanged, but the rate in Central Province had risen to 36 percent. In 1997 the rural poverty rate was 53 percent, according to Kenya's Central Bureau of Statistics (Government of Kenya 2000). Aggregate rural and urban poverty rates were estimated to be 55 percent in 2001 and 56 percent in 2003 (IMF 2005).

Policy initiatives starting in the late 1980s often centered on liberalizing the agricultural economy in an effort to reduce transactions costs and ensure that producer prices reflected global scarcity values. However, the process of liberalization suffered various policy reversals (World Bank 1998; WTO 2000) and was complicated by increasing macroeconomic instability in the early 1990s. Nonetheless, domestic market liberalization has made considerable progress in recent years. While many marketing boards still exist, their roles are greatly diminished. Meanwhile, trade policy reforms have replaced licensing schemes with tariffs, and the tariffs have been steadily reduced. Finally, a shift to a floating exchange rate system in 1993 has eliminated currency overvaluation as a source of price distortion.

Despite the recent policy reforms, performance in the agricultural sector has been disappointing, except for the dramatic expansion in the production of horticultural products and the recovery of cereals production in 2004–06. Slow growth in the marketed supply of cereal crops is partly a result of rural population growth and increased consumption on farms. External shocks, including sharp swings in coffee prices, have also been partly to blame for poor performance. Probably more important for this analysis is the problem of excessively high domestic marketing margins. As a result of the poor state of the rural infrastructure, producers face costs of delivering output and securing inputs that are sometimes prohibitively high (Omamo 1998; Obare, Omamo, and Williams 2003). For certain commodities, regulations continue to protect high-cost public enterprises and parastatals, further raising transactions costs. Moreover, continued regulation and red tape raises the costs of doing business while introducing avenues for corruption (World Bank 2006). All these costs tax the agricultural sector in ways that are not fully reflected in the price distortions calculated here.

Two important developments in the agricultural sector have influenced trends in the measured rates of assistance apart from any changes in policy. First, because of growth in population and demand, wheat and maize have shifted from being exportable commodities to being importable. Administered prices were generally set within the fob-cif band, between the free-on-board (fob) prices that would have been received for exports and the cost-insurance-freight (cif) prices that would have been paid for imports in the major production areas, so this shift implied a change from subsidizing to taxing production relative to free trade. Second, the share of coffee in the sector has fallen relative to those for tea and horticultural production, shifting the commodity mix in the aggregate NRA. And third, the largely undistorted market for fruits and vegetables has muted the weighted average rate of distortion for the agricultural economy as a whole.

Kenya has rarely experienced egregious price distortions in the agricultural sector, but the degree of government support for agricultural development has been uneven over time. Currently, growth in the sector seems to be more inhibited by limited public investment and excessive red tape than by distorting policy interventions. The success in exports of fruits, vegetables, and cut flowers was facilitated by targeted public investment in extension, rural roads, and improvements at the Nairobi airport (Schapiro and Wainaina 1991; Minot and Ngigi 2004). The revitalization of much of the agricultural sector may require investments in physical infrastructure to reduce transactions costs as well as administrative reforms to allow more creative marketing arrangements and macroeconomic stability to encourage private investment. Public investments should be targeted to commodities that have some potential comparative advantage. This analysis suggests which commodities those may be. Unfortunately, the current analysis cannot reveal the precise degree to which current marketing margins are inflated by regulations.

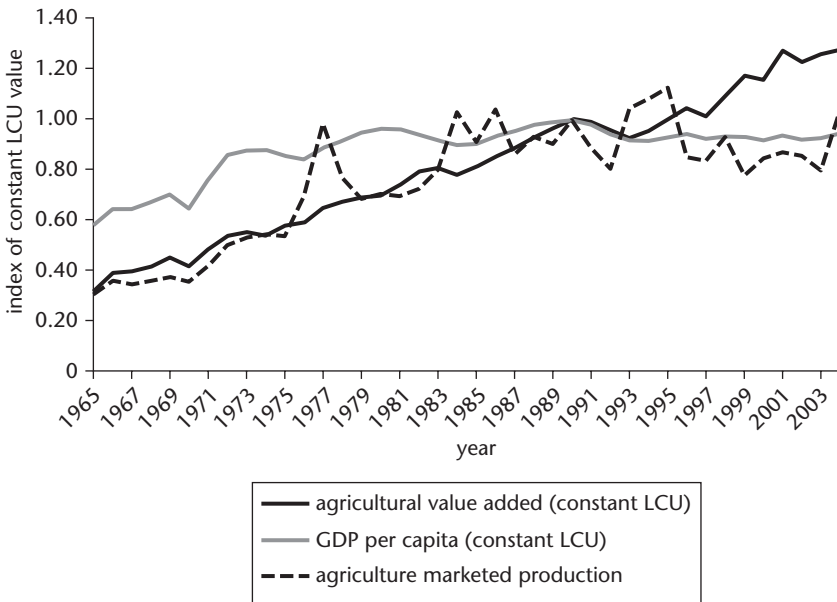
Growth and Structural Changes since 1955

Kenya's strong economic performance up to 1980 was rooted in the growth of the agricultural sector, which has consistently accounted for a large share of employment, value added, and exports. The expansion of agricultural output between 1955 and 1980 was based on increases in cropped area and the opening of commercial production opportunities to small-holder African producers. From 1960 to 1969, cereals output rose by 69 percent, with cropped area growing by 61 percent (FAO 2006). Investment in agricultural research also produced improvements in yields for maize (the primary staple) and the export crops coffee and tea. Price booms for those exports in the 1970s further boosted performance.

The Kenyan economy has yet to experience a structural transformation into industrial production. Indeed the manufacturing sector has seen no growth in its share of the economy, and agriculture continues to account for almost 30 percent of national income. The significance of agriculture in the economy is larger than official data suggest because it has a disproportionately large share of employment, accounts for more than 50 percent of export revenues, and directly contributes to about 50 percent of manufacturing production. In the last 10 years, growth in services, including exportable services (tourism) has eroded somewhat the centrality of agriculture. Value added data suggest that the declining share of the agricultural sector in GDP is attributable to more rapid expansion in services, not to a decline in agricultural output. Data on marketed agricultural production from the government’s *Statistical Abstract of Kenya* give a somewhat different impression, indicating agricultural stagnation since 1990 (figure 9.1).

Not surprisingly, trends in GDP per capita have mirrored growth in the agricultural sector. Figure 9.1 juxtaposes data on per capita GDP with agricultural

Figure 9.1. Agricultural Value Added, Marketed Production, and GDP Per Capita, Kenya, 1965–2004



Source: World Bank (2007) and Government of Kenya, *Statistical Abstract of Kenya* (various years).

Note: LCU = local currency unit.

value added and with the value of marketed agricultural production. Both series show a close correspondence between strong agricultural performance and strong per capita income growth up to 1982. From that point on, the agricultural value added figures continue to grow while per capita incomes and marketed production stagnate. This pattern probably reflects the strain that population growth has placed on the agricultural sector. Kenya's total population grew at an average rate of over 3 percent annually from 1980 through 2004, with the rural population increasing from 13.6 million to 20 million during that period. With this population growth, agricultural land per agricultural worker halved, falling from about 4.4 hectares in 1980 to 2.2 hectares in 2004. Meanwhile, agricultural workers faced a high dependency ratio, with about 50 percent of the population under age 15 throughout the period. While agricultural value added continued to grow through the 1990s, the increases in production did not match population growth and were in large part consumed on the farm.

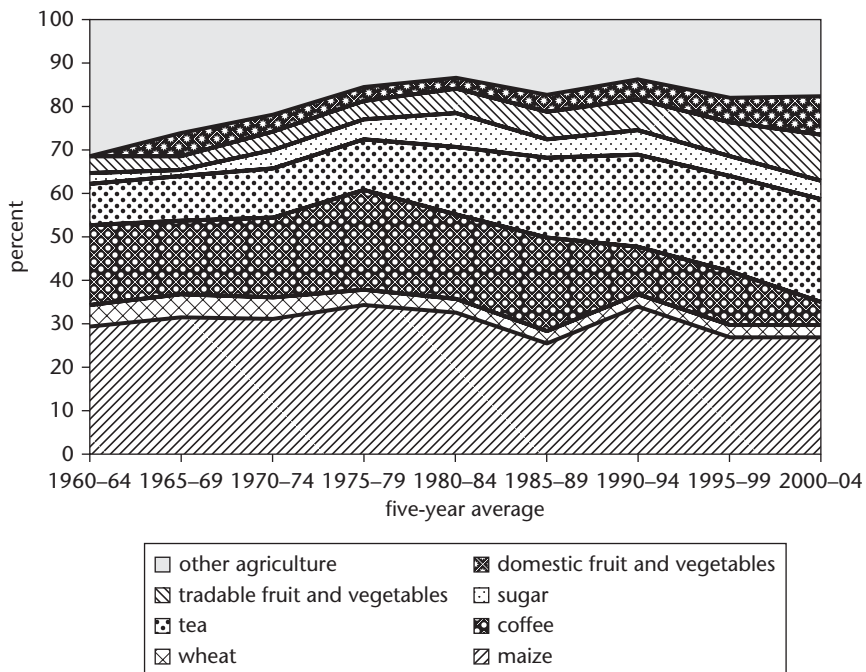
While the Kenyan economy has seen little in the way of structural transformation, the structure of the agricultural sector itself has evolved considerably since 1955. In the first instance, small-holder production expanded relative to estate production for the two main export crops (coffee and tea) and for maize. Through the 1960s, the share of marketed production from small-holders increased rapidly, as did total production. For example, tea production rose from 13,000 metric tons, with 1 percent grown by small-holders in 1960, to 20,000 metric tons with 5 percent grown by small-holders in 1965, and to 40,000 metric tons, with 20 percent grown by small-holders in 1970. Small-holders now produce about 60 percent of Kenya's tea. The small-holder share of coffee production rose from 20 percent in 1960 to 50 percent in 1965, where it remains today.

Expansion of small-holder production did not initially affect the crop mix in production or exports, but over time the crop mix has changed (figure 9.2). First, coffee production has declined in significance, the result of both declining world market prices for the commodity and low growth in output since the late 1980s. Meanwhile tea production has expanded, with tea replacing coffee as the single largest export commodity by value in about 1990 and remaining in that position ever since. Growth in both tea and sugar production was facilitated by institutional innovations and investments to support small-holder production and to formalize the marketing chains that serve small-holders.

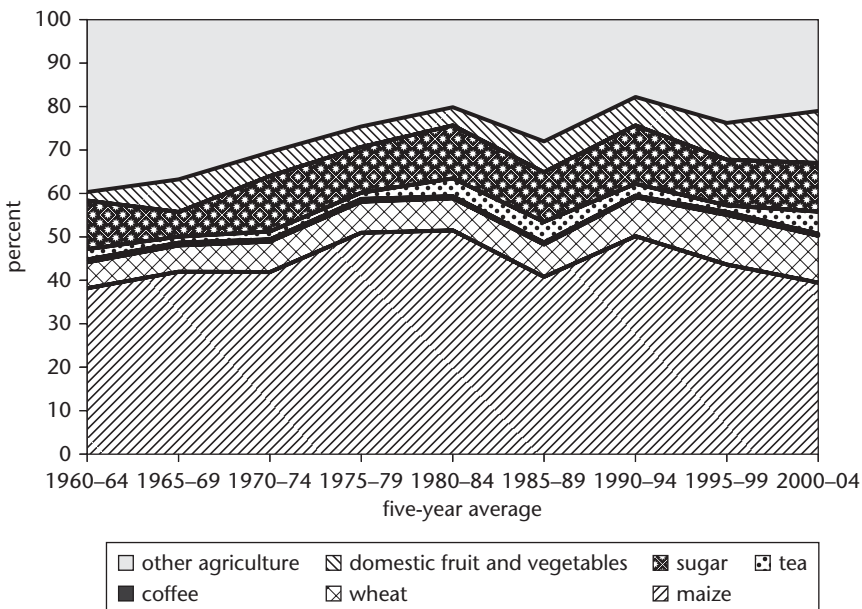
More dramatic than the expansion of tea production has been the growth in exports of horticultural products, as exemplified by green beans. Before 1985, Kenya recorded no exports of green beans. By 2000, exports of green beans exceeded coffee exports. Altogether, fruits and vegetables have accounted for about 20 percent of the value of Kenya's agricultural exports since 2000, about one-quarter of which has been from green beans. Canned pineapples and other

Figure 9.2. Product Shares of Agricultural Production and Consumption, Kenya, 1960–2004

a. Primary agricultural production shares



b. Final household food consumption shares



Source: FAOSTAT; *Statistical Abstract of Kenya* (various years).

fresh vegetables represent most of the remaining exports in this class. Exports of cut flowers have grown on a similar path to fruits and vegetables and account for an even larger share of export revenue, according to the government's *Economic Survey of Kenya* for 2005.

The data on production shares in figure 9.2a are compiled from government sources, the Food and Agriculture Organization's FAOSTAT database (FAO 2006), and scholarly research. Because a large share of maize production is not marketed and much of the marketed maize is sold in informal markets, total maize production is estimated at about four times the marketed output (Pearson and Monke 1995; Jayne et al. 2001). Inflating marketed production figures taken from the *Statistical Abstract of Kenya* by this factor results in production estimates close to those reported in FAOSTAT and Hassan and Karanja (1997). As for horticulture, government sources report only sales of specific crops and do not cover the same crops in all years. Export data are therefore used to estimate production of tradable fruits and vegetables. Moreover, Muendo, Tschirley, and Weber (2004) suggest that the domestic market for fruit and vegetables may have much larger value than the export market. The domestic market for fruits and vegetables is dominated by tomatoes, cabbages, and kale (*sukuma wiki*), with substantial production of cooking bananas and potatoes. Argwings-Kodhek (2005) estimates the value added from domestic horticulture to be similar in scale to export horticulture (including floriculture). Despite the limitations of the data, it is clear that maize has been and remains the core of agricultural production in Kenya, and that the output of tea, fruits, and vegetables has expanded rapidly while coffee output has been in decline.

In addition to changes in crop mix and export concentration, Kenya has experienced a change in market position. As figure 9.2b shows, domestic consumption patterns have been fairly stable, with maize accounting for 40–50 percent of food expenditures and wheat drawing an additional 10 percent. The country, however, has shifted from being a net exporter of wheat and maize in the 1950s and 1960s to becoming a net importer of both of these cereals since the 1990s. The transition from exporter to importer occurred fairly abruptly in the 1970s for wheat, but was more prolonged for maize. Kenya was a net exporter of maize for most of the 1960s and 1970s, while during the 1980s it oscillated between maize surplus and deficit. Since the 1990s, however, it has been a fairly consistent importer, despite the government's policy of targeting maize self-sufficiency. This transition has also come despite successful research efforts to develop improved varieties of maize that have been widely adopted. Indeed, maize yields rose by 1.5 percent annually from 1975 to 1984 and continued to rise through the 1990s (Hassan and Karanja 1997).

Agricultural Policy in the Colonial Period, 1895–1963

Agricultural policy during the colonial period in Kenya (1895–63) was largely motivated by a need to make the East African railroad system profitable. Toward that end, European settlers were encouraged to enter the high-potential agricultural areas of the colony (the so-called White Highlands) and produce commercial crops to be shipped by rail to Mombasa on the coast. Coffee was the initial focus of export production, but colonial authorities promoted experimentation with a range of commodities including wheat, tea, cotton, and pyrethrum. The colonial administration favored settler agriculture, and policies were biased strongly against indigenous, small-holder producers (Mosley 1983).

Colonial agricultural policies included alienation of land from local populations to create an estate sector of European-owned farms. Labor markets were also restricted, with “hut” taxes on small-holder households used as an explicit device for channeling African labor to the estate sector. Access to export markets was restricted to European producers, further encouraging labor supply to the estate sector and protecting European producers from domestic competition. Finally, starting in the mid-1930s, agricultural finance was made available to estate producers at subsidized rates (Winter-Nelson 1995). According to Smith (1976), the bulk of tax revenue before the Second World War was collected from native populations, while public investment in infrastructure and agricultural research concentrated on the estate sector.

Agricultural commodity markets came under administered pricing systems during the colonial period (Mosley 1983; Winter-Nelson 1995). Export-crop marketing boards were established in the 1930s to reduce costs of marketing and enforce quality control. These boards passed world market prices to producers and also enforced exclusion of African farmers from markets. The boards invested in processing capacity and agricultural research and extension in addition to performing marketing services.

Under the Sale of Wheat Ordinance of 1933, the Kenya Farmers Association became the sole legal marketer of wheat. It used this position to maintain an artificially high domestic price, while exporting surpluses at a lower free-market price. To maintain this system, a high import tariff was introduced to keep cheaper foreign wheat out of the colony. The maize market came to be regulated in a similar manner, with the farmers association as the sole legal maize buyer outside of small local markets. Because coffee growers forcefully opposed regulations that could increase the domestic price of maize, thus raising their labor costs, the association administered maize markets in such a way as to stabilize local prices and provide services to growers without imposing a high tax on consumers. Annually, the association announced a price to ensure a “guaranteed minimum

return” to producers and used its market position to deliver (subsidized) crop-secured loans in cash or inputs. The maize purchase price was typically set between import and export parity. It thus shielded consumers from high import prices but ensured profitable production for European settler farmers given the prices charged for inputs.

Starting in 1955, the colonial government began an effort to develop a class of African commercial farmers. The government’s Swynnerton Plan initiated a partial liberalization of the agricultural sector by allowing Africans to produce crops for export. The Swynnerton Plan also introduced a system of land registration and titling for Africans, while continuing to exclude them from owning farms in the White Highlands. In addition to removing cropping restrictions, policy at this point included substantial investment in infrastructure and extension to serve the nascent small-holder commercial farm sector as well as the estate sector. While allowing broader access to markets, the state continued to administer prices for major commodities through marketing boards.

At independence, the Kenyan government maintained a supportive stance toward export agriculture and expanded efforts to commercialize small-holder production. At the same time, an indigenous Kenyan elite entered into large-scale agricultural production. In contrast to many other African countries, Kenya refrained from imposing high implicit or explicit taxes on the agricultural sector in the 1960s. While government control of markets expanded in the postcolonial period, prices were typically administered to pass through world prices to large-scale farmers growing export crops or to the cooperative societies representing small-holder producers. Similarly, the administered prices for maize and wheat were held above export parity but below the cif price in the main growing regions. This pricing was consistent with the colonial price administration (Jabara 1985). However, because commercial maize production became more geographically dispersed as the market came to serve surplus producers throughout the country, the panterritorial pricing scheme introduced larger distortions in some regions than in others.

Direct and Indirect Distortions to Agricultural Incentives

The main focus of the current study’s methodology (see appendix A in this volume and Anderson et al. 2008) is on government-imposed distortions that create a gap between actual domestic prices and what they would be under free market conditions. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project’s methodology not only estimates the effects of direct agricultural policy measures (including distortions in

the foreign exchange market) but also generates estimates of distortions in non-agricultural sectors for comparative evaluation. This involves computing an NRA for nonagricultural tradables for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA).

This study calculates NRAs for maize, wheat, coffee, tea, sugar, export fruits and vegetables, and domestic fruits and vegetables. These commodities account for about 75 percent of the value of agricultural production and value added. The remaining 25 percent comes primarily from nontradable beef for slaughter and raw milk, exportable cut flowers, and importable dairy products. In calculating the overall NRA for agriculture, prices for the nontradable residual commodities are assumed to be undistorted, while prices for exportables are influenced by exchange rate distortions, and the prices of importable dairy are affected by both trade protection and exchange rate distortions. Trade protection is measured through the trade weighted ad valorem tariff rates on milk and dairy reported in Sandri, Valenzuela, and Anderson (2006) or by the average applied tariff for agriculture taken from the *Statistical Abstract of Kenya*.

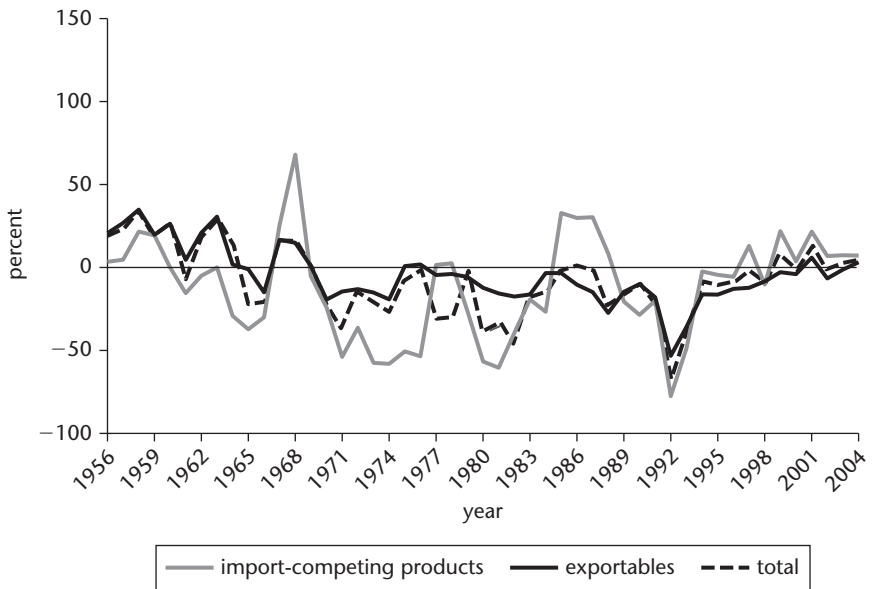
Data on world prices, domestic prices, and volumes of production and trade came from government sources (primarily the *Statistical Abstract of Kenya* and the *Economic Survey*), FAOSTAT, and the UN's Comtrade database. The application was particularly constrained by the availability of reliable data on the appropriate margins to apply for processing and marketing commodities. Sources for data on these costs included Nyoro, Kiiru, and Jayne (1999); Nyoro, Kirimi, and Jayne (2004); Jayne, Myers, and Nyoro (2005); World Bank (2005); and Pearson and Monke (1994). (Additional sources are noted in the discussion of specific commodities; see also the appendix in Winter-Nelson and Argwings-Kodhek (2007). For many crops, actual marketing costs are not documented for long periods of time. Consequently, documented costs for specific years were discounted by the consumer price index and applied to a range of up to 20 years to estimate the actual costs incurred. Even if these estimates of the actual costs are accurate, they include implicit taxation introduced by inefficiencies in the management of public and parastatal intermediaries. Because mismanagement of parastatal marketing boards has been an important issue in Kenya, especially in the 1980s and 1990s, an alternative "best-practices" margin was also calculated and applied to estimate the commodity-specific rates of assistance to farmers. These best practices are typically based on costs incurred in the sector after parastatal reforms were adopted. Rates of assistance to farmers (the NRAs on output for farmers) are adjusted downward from the NRA for the commodity whenever the estimated margin charged exceeded the estimated best-practices margin. This approach creates a wedge between the NRA at the farmgate and the NRA in wholesale markets for many crops, notably maize and wheat, in the 1970s and 1980s. Given the

likelihood of technical change since the late 1950s, the best-practices margins for the 1950s and 1960s have been raised, bringing them closer to estimated actual margins in that period.

Other areas in which data are problematic include the estimates of the appropriate world price (or shadow price) for agricultural outputs and the parameters for estimating support to the nonagricultural sectors that are used to calculate the RRA. Where world prices were particularly difficult to establish (such as those for sugar), upper and lower bounds were explored. Uncertainty in the RRA calculation emerges from limited information on the tradability of output from nonagricultural sectors and from lack of precise data on applied tariffs, taxes, and subsidies as well as on nontariff barriers. However, direct distortions tend to be small in most nonagricultural sectors. Finally, the amount of non-product-specific support that agriculture has received is difficult to estimate. In calculating the aggregate rates of support, this analysis presents indicators that exclude all such support and separate indicators that treat the entire agricultural budget as assistance to the sector.

The NRA estimates shown in figure 9.3 and table 9.1 reveal modest to moderate rates of taxation to the sector overall for most of the postcolonial period.

Figure 9.3. NRAs for Exportable, Import-Competing, and All Covered Farm Products, Kenya, 1956–2004



Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

Table 9.1. NRAs for Covered Farm Products, Kenya, 1956–2004
(percent)

Product indicator	1956–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Exportables ^{a,b}	25.5	16.8	3.3	-16.3	-2.3	-13.0	-14.1	-26.6	-10.5	-0.6
Coffee	-10.7	-0.4	-12.7	-19.4	-4.3	-15.2	-14.8	-21.9	-5.0	-3.3
Tea	2.6	11.5	-6.7	-15.6	-1.0	-10.2	-13.0	-29.5	-14.9	0.2
Vegetables and fruits	—	-1.3	-12.5	-21.5	-6.7	-14.8	-7.4	-12.8	-3.2	0.0
Import-competing products ^{a,b}	12.3	-16.6	4.2	-46.0	-25.3	-40.5	16.1	-35.4	2.9	9.3
Nontradables ^a	0.0	8.0	0.0	-5.5	-19.1	-44.2	-1.3	-6.0	0.0	0.0
Vegetables and fruits	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed trade status ^a										
Wheat	12.3	5.1	10.1	-26.8	-7.7	-20.5	18.6	-10.7	36.8	46.2
Maize	59.4	44.3	13.1	-24.1	-17.2	-46.4	-1.3	-34.5	-5.3	0.5
Vegetables and fruits, tradable	—	-1.0	-9.9	-17.4	-5.3	-11.8	-5.8	-10.5	-2.5	0.0
Sugar	—	-29.1	42.7	-47.9	-24.6	-47.9	21.1	-27.1	30.6	36.5
Total of covered products ^a	23.7	15.8	-2.3	-24.1	-14.7	-29.9	-8.0	-30.0	-4.5	3.7
Dispersion of covered products	30.5	25.8	32.7	20.2	25.7	23.9	20.4	21.7	18.7	19.1
Percent coverage (at undistorted prices)	64	66	70	79	82	85	81	85	80	78

Source: Data compiled by the authors.

Note: — = no data are available.

a. Weighted averages, with weights based on the unassisted value of production.

b. Mixed trade status products included in exportable or import-competing groups depending upon their trade status in the particular year.

c. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

Positive rates of assistance to agricultural producers (and commensurate taxation on food consumers) in the late 1950s and early 1960s are driven largely by high domestic prices for wheat and maize, which are exportables for much of this period. The general shift toward taxation of agricultural production in the 1970s and through the 1980s is followed by a reduction in distortions from the mid-1990s, and, in the last years covered here (2000–04), the NRA for covered farm products is slightly positive.

Considerably more variability occurs in rates of assistance for importables than for other classes of commodities. The negative rates of assistance for importables in the early 1960s arise because maize and wheat were importable in some years during this period and were priced below import parity (but above export parity). Maintenance of a domestic price within the fob-cif band in Kenya implied that maize production was supported on average in the 1960s, but when maize was an importable, its production was taxed (see table 9.1). Because cereals account for a large share of production, importables as a group were subject to negative rates of assistance when maize and wheat were importable. The pronounced spike in assistance to importables in the late 1960s (see figure 9.3) reflects protection of the nascent sugar industry and the exportable status of maize and wheat at that time. Sugar prices often have been held above the international free market price and the Kenyan cif price. Because sugar was the only commodity designated as an importable in 1967–69, importable agriculture appears to have received high protection in that period. In the mid-1980s, the NRA on sugar output increased above its level in the late 1960s, coinciding with another spike in assistance to importables. In later years, the support to sugar continued, but by the 1990s, maize had become an importable commodity, so the overall NRA for that class of goods was lower.

There are three periods during which tradable agriculture and the sector in general had distinctly negative rates of assistance (the early years of the 1970s, of the 1980s, and of the 1990s). In each of these periods, the cause of the taxation on agriculture is an overvaluation of the Kenya shilling. The severe drop in the NRA on output in the early 1990s reflects the additional effect of unusually high world prices for maize and tea that were not matched with increases in farmgate prices. Excessive charges by parastatal marketing boards also contributed to negative NRAs in the 1980s and early 1990s. Only during the late 1970s and early 1980s do prices for nontradables appear highly distorted, a result of maize being treated as a nontradable during this time, when the equilibrium price fell within the fob-cif band. Because the fob-cif band is wide in Kenya, the shadow price is difficult to estimate precisely. Consequently, the NRA on output for maize during this period has a large margin of error. Prices for other nontradable commodities (fruits and vegetables) were undistorted throughout the period.

In contrast to the negative rates of assistance in the 1980s and early 1990s, the years since then have seen little price distortion outside of sugar and wheat, which are importable commodities and receive protection. The decline in aggregate price distortions reflects in part the rapid expansion of horticulture. Both tradable and nontradable horticulture have become substantial shares in total agricultural production, and neither of these commodity groups is subject to direct intervention. The only distortions that are recorded in the tradable fruits and vegetables sector are those that enter through currency overvaluation. The nontradable fruits and vegetable sector is assumed to be undistorted. While the growth in fruits and vegetables as a share of the sector mutes the level of distortion in aggregate, policy reforms (including exchange rate liberalization) have also brought the NRAs for coffee, tea, and maize closer to zero in the last decade under study.

Considering support only for tradable agriculture, the pattern is of assistance in the 1950s and 1960s followed by taxation through the early 1990s and relatively undistorted prices since the mid-1990s. Treatment of non-product-specific public spending influences the measured level of support but does not alter this general impression. As table 9.2 suggests, total agricultural spending (treated as non-product-specific support here) has been between 6 and 20 percent of the value of agricultural production, averaging about 10 percent. The total NRA for agriculture including this support was 9 percent in the 2000–04 period. Excluding this spending, the NRA for agriculture was only 3 percent. In either treatment, the agricultural sector has negative rates of assistance through most of the 1970–94 period.

Meanwhile, nonagricultural sectors are estimated to have had trade protection that implies nominal rates of assistance of over 20 percent from 1960 through 1990, gradually declining to less than 10 percent afterward (figure 9.4). Given these estimates, and treating the agricultural budget as support for tradable agriculture, the five-year averages of the RRA were negative from the late 1960s through the late 1990s and turned slightly positive after 2000. Excluding non-product-specific spending, the RRA remains negative through the 2000–04 period.

The final three rows of table 9.2 report values for three indicators assuming exchange rate distortions are not taken into account. They suggest that distortions in the local market for foreign currencies accounted for up to 10 percentage points of the negative NRAs and RRAs from independence until the end of the 1980s.

Distortions by commodity

The following section describes the evolution of NRAs by commodity, in rough order of importance starting with coffee and tea, then wheat and maize, sugar, and fruits and vegetables.

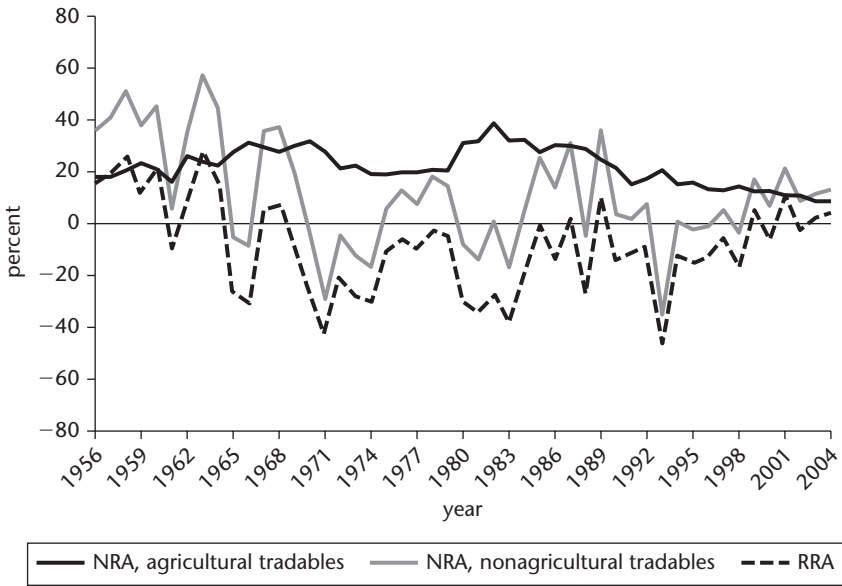
Table 9.2. NRAs in Agriculture Relative to Nonagricultural Industries, Kenya, 1956–2004
(percent)

Indicator	1956–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRA, covered products	23.7	15.8	-2.3	-24.1	-14.7	-29.9	-8.0	-30.0	-4.5	3.7
NRA, noncovered products	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-1.2	-0.3	0.0
NRA, all agricultural products	15.2	10.1	-2.2	-19.2	-12.3	-25.7	-6.6	-26.8	-3.7	2.9
Non-product-specific assistance	11.4	12.8	11.9	7.5	10.7	7.1	17.2	21.0	6.1	6.4
Total agricultural NRA (including NPS) ^a	26.6	23.0	9.7	-11.8	-1.7	-18.6	10.5	-5.8	2.4	9.3
Trade bias index ^b	0.12	0.18	0.09	0.64	0.48	0.57	-0.24	0.31	-0.12	-0.09
NRA, all agricultural tradables	41.5	37.7	15.7	-13.3	11.8	-6.5	20.3	-4.3	3.1	12.3
NRA, all nonagricultural tradables	20.0	21.9	29.2	24.5	20.0	33.2	28.3	18.0	13.8	10.3
RRA ^c	17.9	12.7	-10.4	-30.2	-6.9	-29.9	-6.1	-18.7	-9.3	1.9
Memo item, ignoring exchange rate distortions:										
NRA, all agricultural products	26.9	23.4	15.6	-3.4	1.2	-15.3	13.5	-4.6	3.0	9.3
Trade bias index ^c	0.13	0.20	0.28	1.19	0.62	0.92	-0.16	0.64	-0.08	-0.09
RRA ^c	18.4	13.7	0.4	-16.3	-1.4	-21.4	0.2	-15.5	-8.1	1.9

Source: Data compiled by the authors.

- NRAs including product-specific input subsidies and non-product-specific (NPS) assistance. Total of assistance to primary factors and intermediate inputs divided to total value of primary agriculture production at undistorted prices (percent).
- Trade bias index is $TBI = (1 + NRA_{agx}/100)/(1 + NRA_{agm}/100) - 1$, where NRA_{agm} and NRA_{agx} are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.
- The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 9.4. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Kenya, 1956–2004



Source: Data compiled by the authors.

Note: For a definition of the RRA, see table 9.2, note c.

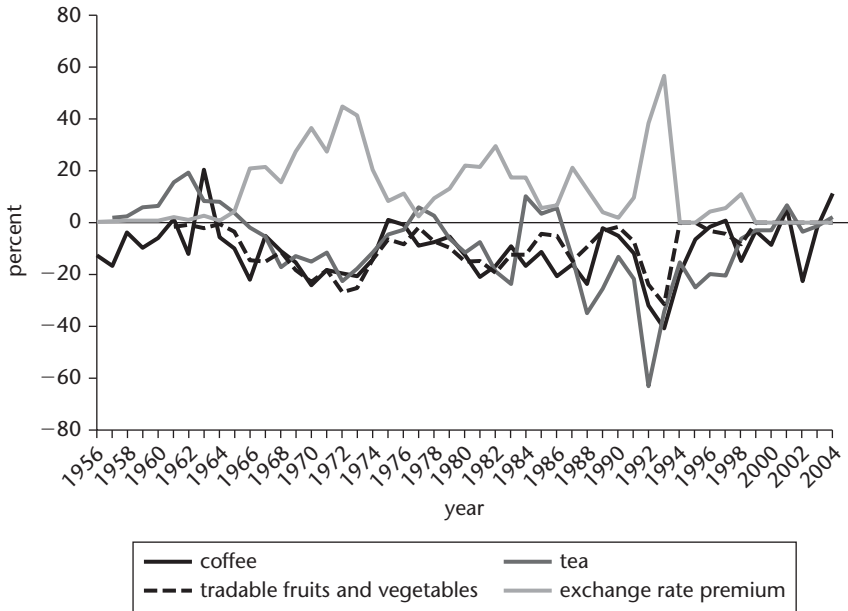
Coffee and tea

The data for NRAs for coffee and tea reveal very little impact directly from agricultural policy. Official records of producer prices indicate that growers consistently received close to the export parity price converted at the official exchange rate. As figure 9.5 indicates, deviations from export parity occurred primarily when the Kenya shilling became overvalued in the early 1970s, early 1980s, and early 1990s. When the exchange rate is undistorted, the NRA is usually near zero. Negative NRAs that are not explained by exchange rate distortion can be attributed to charges by the parastatal intermediary in excess of the best-practices cost estimate.

The impression of generally modest price distortions in tea and coffee is subject to at least two important caveats. First, considerable public investment was made in both these sectors in the 1960s and 1970s. Moreover, both sectors received subsidized credit through the central government at that time. While neither of these effects is quantified in the analysis, their impact would be to increase the rate of assistance, bringing the NRAs closer to zero.

A second feature of the analysis may be more misleading. The producer prices used are the prices paid out by the central marketing authority. These prices were

Figure 9.5. NRAs for Producers of Export Crops, Kenya, 1956–2004



Source: Data compiled by the authors.

paid directly to estate producers but channeled through cooperatives for small-holders. After the coffee and tea booms of the 1970s, small-holder growers complained repeatedly of delayed payments, with delays of more than a year often reported. Discounting the value of farmer prices for these delays would make the NRAs more substantially negative in many instances. However, the extent and duration of actual delays are unknown.

The deviation between the NRA for estate producers and that for small-holders may be more pronounced for coffee than for tea. Small-holder producers are required to use cooperative societies for the initial (wet) processing of arabica coffee. Cooperatives charge about twice the costs reported by estate growers for this service (World Bank 2005). These costs are deducted from the grower price. (The NRA falls by about 7 percentage points if the full cost differential is treated as a tax.) Given payment delays, small-holders may have faced some taxation even when the NRAs are positive, and intermediaries, including cooperative unions and parastatal agencies, could have captured positive rates of assistance when the NRA is negative.

Wheat and maize

Based on shares of production and consumption, maize is the single most important commodity in the agricultural sector. As a result, price distortions in maize tend to drive the overall degree of distortion in the sector. An exception to this tendency arose during the coffee boom in the 1970s, when the value of coffee production briefly exceeded that of maize.

Distortions to incentives for cereals production have probably been somewhat greater than those in coffee and tea but are still generally modest. Until the mid-1990s, prices for maize and wheat were administered by the National Cereals and Produce Board or its predecessor institutions. In the case of wheat, this system implied a price that was above both import parity and export parity for much of the period. Following the colonial administration's lead of setting the maize price to balance a positive return to farmers with affordability for consumers, the administered maize prices tended to fall between export and import parity, at least for producers in Kitale District, a major supplier of maize for the country.

During the past 50 years, population growth and some income growth have caused cereals demand to rise more rapidly than supply. As a result, cereal crops have gradually shifted from being exportable to being importable. Based on trade patterns, both maize and wheat were exportable products through most of the 1960s, but since the mid-1970s, wheat has been an importable. In the case of maize, production growth was more robust, but by the 1980s the commodity could reasonably be classified as a nontradable, with a domestic equilibrium price falling somewhere within the rather wide fob-cif band. Since 1990, Kenya's average position in maize has been one of a significant importer, despite occasional surpluses. In this analysis, wheat is treated as exportable from 1960 to 1971, save for 1962, and as importable from 1956 to 1959 and from 1972 onward. Maize is treated as exportable from 1956 to 1976 except for 1961, and during 1964–66 and 1970–71. It is taken as a nontradable from 1977 to 1991 and as an importable from 1992 onward.

This transition from exportable crop to importable crop occurred while prices were administered to fall within the fob-cif band. The effect of agricultural policy then was to subsidize maize and wheat while they were export crops. In both cases these subsidies were defended from international trade through import restrictions. The cereals board was the sole entity with the legal right to import maize and wheat. Tariffs were also in place, but these tariffs were suspended when large imports were deemed necessary. They were redundant when the cereals board simply declined to import. The shift to importability for wheat implied a rise in the reference price for measuring distortions from the fob to the cif price. This, plus exchange rate distortions, resulted in implicit taxation of the commodity in the 1970s, but wheat appears to be subsidized in the late 1980s and 1990s. The

measured protection to wheat is consistent with high applied import tariffs in the 1990s and after 2000.

In contrast to wheat, the rates of assistance to maize are negative for most of the 1970s, 1980s, and 1990s. The shift to referencing against the higher cif price implied a major reduction in the NRA for maize in the 1980s. This downward pressure on the NRA was exacerbated by marketing costs in excess of the best-practices estimate. In the 1990s, the market for maize was liberalized and marketing margins fell, encouraging a recovery in the NRA. The market has been largely undistorted since 2000. While a duty on imported maize exists, this duty was repeatedly suspended when the country faced substantial maize deficits. Undocumented trade in maize from neighboring countries has also muted the effect of the tariff. The combination of these factors has led to an NRA for maize that is now quite modest.²

As with coffee and tea, exchange rate distortions overwhelmed direct interventions in the early 1970s and early 1990s. In each of these periods, the NRA for cereals was negative. In other periods, the negative NRA is associated with intermediation charges in excess of the best-practices margin and with the administration of the price.

At least two caveats should be made concerning the calculated NRAs for maize and wheat. First, panterritorial pricing coupled with high transportation costs implied very different experiences across the country. The NRAs were calculated based on transport costs from Kitale District, a region with a large cereals surplus (Nyoro, Kirimi, and Jayne 2004). However, other parts of the country would have somewhat different NRAs. Second, the reference price for maize in the 1980s, when the crop is classified as nontradable, is taken as the average of the fob and cif prices, weighted 3 to 1 in favor of the cif price. (A simple mean was applied for 1978–80.) Revisions of this crude proxy to other levels within the fob-cif band could change the sign on the NRA. Despite these concerns, the results presented here are consistent with other analyses of rates of assistance to cereals in Kenya. Shapouri, Missiaen, and Rosen (1992) report producer subsidy equivalents for maize and wheat in Kenya in the 1980s that are similar in levels and in patterns over time to our NRAs. Consistent with this study, the distortions they identify in the early 1980s result from exchange rate misalignment, while later distortions result from administered pricing of the commodities.

Sugar

In this analysis sugar has been treated as an import substitute product throughout the period. Although Kenya has occasionally exported large volumes of sugar, our decision to classify it as an import substitute is based on the high cost of domestic production compared with the international free market price. The NRAs for

sugar production have varied widely through time but are now large and positive. These direct rates actually understate the full support this sector receives, because the government has made and continues to make significant investments in the sector while repeatedly writing off debts and providing subsidized credit.

Estimating the NRA for sugar is complicated by distortions both within and outside Kenya. Kenya has occasionally had preferential access to markets in Europe and exported sugar at well above the free market price. Meanwhile the country has imported sugar at a relatively high cost from sources in the region (primarily South Africa, Malawi, and Egypt). Imports from these and other countries of the Common Market for Eastern and Southern Africa (COMESA) are not subject to the 100 percent tariff applied to other sugar exporters. Use of import and export unit values from customs data would suggest that Kenyan producers often face an import price that is less than the export parity for the same-quality product along with export and import parity prices that are above any free market level. The use of these data could suggest that Kenyan producers cannot compete with imports but can compete in the export market. Rather than using Kenyan cif prices, one could apply a “free market” reference world price adjusted for shipping costs. This approximation, however, is subject to error stemming from quality differentials, variation in transportation costs, and other factors.

Using the free market prices from the Global Economic Monitor Database of the World Bank, the NRA data indicate rates of protection in excess of 100 percent in many years. When the cif price is taken as the reference, the NRA figures are more modest, but still exceed 50 percent. The two series present a reasonable set of bounds for the assistance estimate. In calculating the weighted average NRA and other aggregate measures of assistance for agriculture, the lower bound is used.³ The NRA estimates for sugar are comparable in size and volatility to estimates made by other analysts. Earley and Westfall (1996) report producer subsidy equivalents for Kenyan sugar as follows:

1982	1983	1984	1985	1986	1987	1988	1989
-262	15	-8	97	96	63	63	-9

These calculations confirm the impression of a pronounced increase in assistance in the mid-1980s, as well as periods of taxation in the early 1980s and again at the end of the decade. High measured rates of assistance to sugar are consistent with import restrictions in the 1970s and 1980s and with high import duties since the 1990s. The consumer tax equivalent on sugar is even greater than the NRA because the commodity has been subject to exceptionally high excise taxes in addition to the interventions already mentioned.

In addition to uncertainty regarding the appropriate reference price, there is considerable question about the best-practices and actual processing costs for

sugar. Estimates of postfarm costs range from \$100 to \$300 a metric ton, varying by year, factory, and source of cane. The average cost in African, Caribbean, and Pacific countries reported in Odek, Kegode, and Ochola (2003) is \$105 a metric ton. Given the low sucrose content of Kenyan cane sugar, a slightly higher than average value of \$150 is used in the analysis from 1980 onward, with a higher cost of \$200 applied before 1980 to reflect lower processing capacity (Jackson 2004). Use of a higher cost would increase the NRA. Overall, it is clear that the total costs of sugar production are high in Kenya relative to other eastern and southern African producers. Jackson (2004) places production costs for raw sugar in Kenya, Tanzania, and Uganda at about \$290 a metric ton compared with \$210 for other countries exporting sugar in eastern and southern Africa. The Kenya Wetlands Forum (2005) reported costs in Kenya to be 40 percent above costs in other COMESA countries.

Fruits and vegetables

Growth in horticultural production and export has been a bright spot in Kenya's recent economic performance (Minot and Ngigi 2004; Voor Den Dag 2003). As mentioned, exports of fruits and vegetables have recently grown from a small share of total exports to become a major component. Because of the significance of horticulture in the agricultural economy, an NRA has been calculated for the composite category of export fruits and vegetables (see table 9.1).

The NRAs reported in table 9.1 are based on the volumes and revenues from fruits and vegetables exports reported by the FAO and on the internal marketing margins associated with green beans. Green beans are the largest single fresh vegetable export (this category having previously been dominated by processed pineapples).

The constructed NRA for tradable fruits and vegetables represents an estimate of the NRA for green beans that is scaled up to the volume of total fruits and vegetable exports. While this approach implies aggregation of such distinct products as apricots and zucchinis, it allows for inclusion of this important sector in calculation of the NRA. To ignore it completely would imply a measure of price distortions that failed to reflect the conditions in a highly dynamic part of the country's agricultural economy. The biases implied by treating this diverse set of crops as one constituent part (green beans) may be small because the major components of the fruits and vegetables group appear to be uniformly unaffected by policy.

The exportable fruits and vegetables sector has emerged with little policy intervention, but it has benefited from public investment in rural infrastructure, increased airfreight capacity, and agricultural extension as well as a supportive macroeconomic policy environment. While trade restrictions do prohibit the import of certain horticultural crops, the bulk of fruit and vegetable exports has

not been subsidized or protected directly. For all of these commodities, the main distortions to producer incentives have been indirect, through occasional currency overvaluation. Fruits and vegetables do face a 1 percent cess for services from the Horticulture Development Authority.

The great majority of fruits and vegetables grown in Kenya are destined for domestic markets and either do not meet the standards of or lack access to international markets (Muendo, Tschirley, and Weber 2004). Data from FAOSTAT suggest that by weight, only about 5 percent of Kenyan vegetable production and about 7.5 percent of fruit production is exported. The nonexport production sells at a much lower price in largely unregulated (and undistorted) markets. Although import duties are placed on horticultural products from Uganda and Tanzania, these duties are unlikely to be relevant, given the porous nature of the borders and the high costs to long-distance transportation of the commodities. Because production of nontradable fruits and vegetables has expanded rapidly and now accounts for a large share of the agricultural sector, the RRA calculation for this study includes an estimate of the NRA for nontradable fruits and vegetables.

Tomatoes, onions, kale, and cooking bananas constitute about half of the value of domestically consumed vegetables and fruits (Ayieko, Tschirley, and Mathenge 2005). Evidence in Muendo, Tschirley, and Weber (2004) suggests the total value of domestically traded fruits and vegetables is about three times the value of the exported counterparts. Argwings-Kodhek (2005) estimates the agricultural value added from the domestic horticulture sector to be similar in level to that of export fruits and vegetables plus floriculture. Further, based on Muendo, Tschirley, and Weber (2004), we set the price of the domestic products to be about half of the price of the export version of the same product. Because the nontraded crops tend to be bulky, lower-priced goods (potatoes rather than green beans), the price per kilogram of the nontraded vegetables and fruits group is set at 15 percent of the price in the exportable sector. At this price, the value of the nontradable fruits and vegetables is about one-and-a-half to two times that of their export counterparts. These prices are assumed to be completely undistorted by policy. Their inclusion in the analysis therefore tends to bring the calculated total NRA for covered farm products toward zero, but has no effect on the calculated rates of assistance in the importable and exportable subgroups.

Policies behind the Distortions since 1960

Kenyan agriculture benefited from a supportive policy environment during the first 20 years of independence. Unlike their counterparts in other African countries, the Kenyan political elite had strong agricultural interests at independence. Government interventions supported both the estate sector and small-holder

production. Through the Kenya Tea Development Authority and other institutions, significant investments were made to facilitate small-holder production of export agriculture. Pressure for efficient operation of these public enterprises in agriculture can probably be explained by the coincidence of interests of the numerous small-holders and the politically important estate producers (Jabara 1985; Bates 1989).

The policy stance toward cereals has been somewhat more complicated because the country has historically tried to balance demands for low-cost maize with support for producers. Until 1996, maize and wheat prices were administered by the parastatal National Cereal and Produce Board and enforced by the state. The cereals board also controlled all import and export of maize and all long-distance trade within the country. In general, prices were held within the fob-cif band for the major cereals-producing region. However, the combination of high transportation costs and panterritorial pricing meant that some producers received prices outside of their local fob-cif band. In some instances, when the cereals board found itself unable to cover the costs of serving specific regions, it failed to open buying centers or to deliver maize for consumers (Bates 1989; Pearson and Monke 1994).

Price administration allowed the cereals board to deduct its intermediation costs from the wholesale prices and provided little incentive to control those costs. Since liberalization of the maize market in 1996, marketing margins appear to have fallen considerably for maize. Based on Nyoro, Kirimi, and Jayne (2004), costs of moving maize from Kitale District to Nairobi have dropped from about \$400 a metric ton to \$200. The main beneficiaries of this decline have probably been the consumers (Argwings-Kodhek, Mukumbu, and Monke 1993; Nyoro, Kiiru and Jayne 1999; Nyoro, Kirimi and Jayne 2004). The current analysis uses marketing margins from the postreform period to estimate best-practices margins. Thus, excess charges by the National Cereal and Produce Board are treated as a tax amounting to 50 percent of the margin that was charged, and lowering the farmer NRA. The liberalization of maize markets seems fairly thorough now, although the cereals board does influence prices through maintenance of stabilization stocks. Moreover, the route to liberalization was slow. In 1988, limited unlicensed maize trade was allowed. In 1992, the liberalization process was practically halted; it was not until 1996 that the cereal board was significantly downsized. Despite increased competition from private traders, the board remains a major player in the Kenyan maize market. Jayne, Myers, and Nyoro (2005) present analysis suggesting that maize purchasing by the board supported domestic producer prices in 2002, when they otherwise might have fallen significantly. Their analysis suggests that the cereals board may be serving to maintain a price floor, in contrast to its earlier tendency to impose a producer tax.

In contrast to maize, the NRA on wheat has been increasing recently and suggests significant price distortion. Like maize, the domestic wheat market has been liberalized, but imports of both cereals have been subject to tariffs of 35 percent. The maize tariff has been suspended repeatedly when large imports are required, and Jayne et al. (2001) suggest that maize smuggling has diminished the impact of the tariff. Tariffs on wheat, in contrast, have not been suspended, and informal trade flows are unlikely to be large. From a political economy perspective, the difference in treatment of two cereals could be explained by the fact that maize is grown primarily by small-holders and is consumed as a staple, while wheat is grown primarily on estates and is consumed less widely.

Like cereals, coffee and tea markets have been administered by parastatal bodies. The Kenya Tea Development Authority and the Coffee Board of Kenya with the Kenya (coffee) Planters Cooperative Union have had a policy of passing through to farmers the world price minus processing and marketing costs. In general, producer prices appear to be close to export parity calculated at the official exchange rate. However, both coffee and tea producers have complained of long delays in payments. The delays, which imply a reduction in the real price received, may be attributable to the local cooperative societies through which small-holder production was channeled in addition to the national organizations. The NRA data reported here are based on payments by the tea authority and the coffee board and so do not reflect local deductions made by cooperative societies.

The system of pass-through pricing implies little incentive to hold intermediation costs down. Payment delays may have been partly a mechanism for covering rising costs of intermediation by reducing the real prices paid to farmers (Pearson and Monke 1994). Liberalization and privatization have progressed to a degree for Kenyan tea and coffee. The tea authority has been replaced with a private body, the Kenya Tea Development Agency. The estimated NRA for tea takes the costs incurred by the private agency as an estimate of best practice for calculating the marketing margins. Using this estimate, tea is subject to slight taxation on average over the period and is currently undistorted. If a larger margin were to be assumed, set at the average costs incurred in the late 1980s, tea would appear to be undistorted on average over the last 40 years and to be subsidized currently. Given the absence of any policy to explain such a subsidy and the likelihood of some inefficiency in the earlier administration of the parastatal tea authority, the NRA based on best practices seems preferable.

For coffee, the implicit taxation through the deviations from best practices appears to be larger than it is for tea. The best-practice cost figures we use suggest \$100 per metric ton for final processing and marketing of arabica coffee. Costs

charged over time have ranged from \$25 to \$800, with an average well over the best-practices figure. Coffee marketing has also been liberalized, with the coffee board playing a reduced role. However, liberalization of the coffee system is a continuing process. Through 2006, coffee growers were critical of requirements that all Kenyan coffee pass through the coffee board auction, because they felt that the system precluded access to higher prices available through direct contracting. This problem may have been particularly serious for the highest-quality and specialty coffees. Further criticisms suggested that coffee producers are being forced to work through the coffee board when more innovative and lower-cost intermediation may be possible. In a sign of government responsiveness, starting in January 2007 coffee cooperatives were allowed to market coffee directly to international dealers, avoiding the coffee board auction for the first time.

In contrast to coffee and tea, sugar policy in Kenya has been highly distortionary. Sugar prices have been administered at a level well above the free market price, imports of sugar have been taxed heavily and subjected to quotas, and consumers of sugar have faced high excise taxes. While liberalization is fairly well advanced in cereals, tea, and coffee markets, the sugar market remains tightly controlled by the state. Because farm-level production costs are high in many of the sugar-growing areas, some of the assistance to the sector is passed onto farmers to support production. However, sugar factories are well positioned to capture a large share of the subsidy to the sector. Currently Kenya demands about 200,000 metric tons of sugar in excess of domestic production. Imports from outside the COMESA region are subject to a 120 percent tariff. A quota of approximately 100,000 metric tons of table sugar and 100,000 metric tons of refined sugar limits duty-free imports from COMESA countries. The quota on imports from COMESA is allowed under a protective provision that was scheduled to expire in February 2008, but the government of Kenya was seeking to extend this protective quota provision to 2011. After that time, Kenyan sugar industry may be subject to competition from lower-cost sources in the COMESA region (FAO 2007; Export Processing Zones Authority 2005).

The liberalization of Kenya's agricultural sector was a priority of the international financial institutions (World Bank 1998). Kenya agreed to numerous adjustment lending programs in the 1980s and 1990s that stressed liberalization and privatization. The country's compliance with those programs was often poor. Nonetheless, once the national leadership was convinced of the need for reform (or its inevitability) and found politically acceptable mechanisms for introducing it, the liberalization program gathered speed. The success of liberalization of maize markets and of markets for agricultural inputs attests to the potential for further gains in areas that remain controlled.

Fiscal and trade policy

Historically, the government of Kenya has relied on excise taxes, income taxes, and import duties for revenues. The mix has been complicated, but trade taxes are becoming decreasingly important as a source of revenue. Export duties were largely eliminated in the 1970s, and tariffs have played a decreasing role since the introduction of a value added tax (VAT) system in 1989 (Karingi and Wanjala 2005; Muriithi and Moyi 2003). Import duties accounted for almost 40 percent of tax revenue in the 1960s, falling to about 25 percent in the 1970s and to about 16 percent since the VAT was introduced. Excise duties continue to account for about 16 percent of government revenue, as they did in the 1960s, while income taxes have consistently accounted for about one-third of revenue.

The VAT now accounts for 25–30 percent of government revenue. It was initially differentiated into 15 categories, with rates ranging from zero to 150 percent. It was soon simplified to a system of 4 (and later 3) categories, ranging from zero to 16 percent with a standard rate of 16 percent. In addition, a few goods, including sugar, remain subject to excise taxes. Both imported and domestically produced goods are subject to the same VAT rates. Imports, however, are subject to separate import duties. Thus the tax on imported sugar from non-COMESA sources includes both an import duty of 120 percent and a development duty of 7 percent in addition to the 16 percent VAT charged on all noncereal agricultural products.

Average import tariffs have been falling in Kenya. This reflects efforts to comply with the World Trade Organization as well as a strategy since the mid-1970s of reducing import tariffs on industrial inputs as a way to increase effective protection of the manufacturing sector. Average tariffs have been falling, but tariffs on agricultural products have risen over the past 15 years. Average tariff rates on food and livestock are now about 35 percent, with much higher rates on sugar and a few other specific agricultural products.

While the trend in increased applied import duties in agriculture appears pronounced, it is not clear how great the practical implications are. Because trade in most agricultural products was controlled by parastatal organizations for most of the period 1955–90, nontariff barriers to imports were the more relevant source of distortion. Partly in response to pressures from the WTO and international financial institutions, the nontariff barriers have been replaced with tariffs. The trend toward zero in the calculated NRA would suggest that the current applied tariffs in agriculture have less impact than the nontariff barriers of the past. Be that as it may, the applied tariffs are distorting for specific crops (such as wheat), and uncertainty about the application of tariffs may negatively affect potential importers of maize.

Regulation, red tape, and rent seeking

Over the last 20 years, Kenya has preserved a large state presence in much of the economy and has also developed a reputation for corruption. Allegations and evidence of fraud and corruption have at times been particularly strong in the area of customs and international trade. The abundance of red tape and the possibility of corruption among those administering paperwork raise transactions costs and create inefficiencies in the economy that are not captured in this analysis. According to the World Bank's Doing Business survey for 2005, importing into Kenya required 13 documents, 20 signatures, and 62 days compared with 9 signatures and 34 days in South Africa and 10 signatures and 25 days in Thailand. Exporting from Kenya required 15 official signatures and 45 days, compared with 7 signatures and 31 days in South Africa and 10 signatures and 23 days in Thailand.

Many of the regulations in the Kenyan economy are perceived to foster corruption and rent seeking, further raising transactions costs. The "corruption perception index" published by Transparency International ranked Kenya 144th out of 158 countries in 2005, placing Kenya in a tie with Somalia, Sudan, and the Democratic Republic of Congo. Apparent improprieties in the 2007 presidential election reinforced the impression of corruption in the country. Even if corrupt practices were controlled in Kenya, the relatively onerous paperwork requirements constitute an impediment to trade and economic growth. Initiatives are now in progress in Kenya to create a fast track that would remove license requirements in the absence of environmental, health, and safety considerations. Moreover, the Doing Business survey for 2007 (World Bank 2006) indicated a marked reduction in red tape since 2005.

Prospects

The Kenyan economy has historically benefited from good performance in agriculture, while the agricultural sector has benefited from a political elite that had strong rural links, largely through the estate sector. In the recent past, agricultural production has faltered, the economy in general has suffered, and poverty has spread. Although direct taxation of the agricultural sector does not seem to have been a substantial factor in this decline, indirect taxation through currency overvaluation played a role. Other policy factors that probably contributed to the decline in the sector include growing domestic marketing margins, which stem from poor infrastructure services and high costs in the parastatal marketing enterprises. One explanation for the government's tolerance of these rising costs in the agricultural sector could be that the political elite found it increasingly attractive to use agricultural marketing institutions and monetary policy to serve

short-term political goals including redistribution, employment, and patronage rather than long-term economic development (Bates 1981).

Sound public investment in developing the horticulture sector indicates that the Kenyan government is willing to make strategic moves to enhance agricultural output. Meanwhile, heavy investment in sugar and continued protection of the sector suggests that agricultural policy will continue to be used to affect politically important distributional objectives.

Policy reforms to liberalize the agricultural markets were made in the hopes of reducing marketing margins and increasing agricultural output. In the case of maize markets, in which the parastatal cereals board now plays a much-reduced role, this goal was achieved. Marketing margins have fallen by half compared with the prereform period, and consumer prices have fallen as a result. There is less evidence of such reductions in marketing margins or a shift toward competitive and open markets in the case of coffee, tea, and sugar. However, the loosening of administrative regulations restricting trade and marketing systems is encouraging.

Further expansion of the agricultural sector probably requires public investments in areas of potential comparative advantage (such as horticulture), continued policy reforms to reduce the costs of doing business, and maintenance of a stable macroeconomic environment to encourage private investment. Whether policy makers in Kenya will find such policies in their interests remains to be seen, but the current political debate and recent administrative reforms suggest the possibility of further progress.

Notes

1. Unless otherwise noted, data in this paper are from the World Bank's World Development Indicators online (www.worldbank.org/data).

2. The low rates of assistance shown in this analysis are consistent with Jayne, Myers, and Nyoro (2005), who indicate that maize prices have averaged only 2–3 percent above import parity over the last 15 years, despite the de jure 20–30 percent tariff.

3. Winter-Nelson and Argwings-Kodhek (2007, appendix figure 4) present NRA estimates using both the cif price and the free market reference price for sugar adjusted for shipping costs. Only when the Kenya shilling was significantly overvalued did the NRAs become negative. While the cif data can be expected to understate the degree of protection, the rates indicated from use of the reference price cannot be defended based on actual policies. Because sugar's share of agricultural production is small, the choice of sugar price has little impact on the weighted average NRA, but it has considerable effect on the estimated assistance to importables when maize is treated as an exportable or nontradable.

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SUDAN

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Agriculture is the most important sector in Sudan's economy. It accounts for close to 40 percent of the country's gross domestic product (GDP), provides a livelihood for more than 80 percent of the population, and employs about 70 percent of the active labor force. This study is by no means the first examination of price and trade policies in Sudan, but it is the most comprehensive in terms of its commodity and temporal coverage.¹ In this chapter, we examine the evolution of policies since 1955 and provide new estimates of the effects of distortions on agricultural incentives for 12 of Sudan's agricultural products. Together, these products account for around three-fourths of agricultural output value.

Since independence in 1956, Sudan's agricultural policies have provided government hegemony over production, marketing, and trade of farm products through a series of public-sector-led development plans, production and marketing parastatals, and close control of foreign exchange transactions with an overvalued currency. Many attempts were made to reduce overvaluation, particularly during the 1980s with interventions from the World Bank and the International Monetary Fund, but it persisted into the late 1990s. Trade flows were for a long time subjected to quantitative controls and licensing, and the tariff structure continued to tax trade until recently. Agricultural import tariffs averaged about 30 percent in recent years.²

Market interventions have been accompanied by significant public investment in agriculture, most of which has been directed to the irrigated sector, with notable neglect of the economically more important traditional, rainfed sector.

* The authors are grateful for helpful comments from workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Faki and Taha (2007).

Other important policies since independence include land acquisition, production controls, and land and crop taxes (especially indirect ones) that have provided the bulk of government budget revenue.

This chapter begins with a summary of the country's economic growth and structural changes since independence. It then provides empirical estimates of the changing extent of distortions to agricultural incentives over the past 50 years. The reasons behind the government's policy choices are analyzed, and the chapter concludes with a discussion of prospects for further policy reform.

Growth and Structural Changes since 1955

With a total land area of about 2.4 million square kilometers, Sudan is the largest country in Africa in geographic terms. Demographically, its population of around 36 million is growing at a rate of about 2.6 percent a year. Economically, even by the most conservative estimates, more than 50 percent of the population is living on less than \$1 a day. Poverty in Sudan is mainly a rural phenomenon, and the level of poverty is closely linked to the strength of agricultural productivity. The economy is based predominantly on agriculture, which in turn is based on three major farming systems: irrigated; rainfed, semimechanized; and rainfed traditional agriculture, accounting for around 30 percent, 10 percent, and 60 percent of agricultural production, respectively. Crop production accounts for 53 percent of agricultural output, livestock for 38 percent, and forestry and fisheries (not considered in this study) for 9 percent. About 60 percent of all crop production comes from the irrigated sector, 7 percent comes from mechanized dryland farming, and the remaining 33 percent from the traditional rainfed sector.

Ever since a period of food shortages in the 1980s, the government has given attention to the production of food crops, resulting in large expansions in the amounts of sorghum and wheat planted and harvested, often at the expense of the main cash crop, cotton, the production of which has declined by more than 40 percent since the mid-1980s. Livestock production is most prevalent in the traditional rainfed farming systems but is increasing in irrigated areas.

Although endowed with rich natural resources, Sudan remains underdeveloped, primarily as a result of protracted civil strife and poor economic management. During the three decades from 1960 to 1990, the Sudanese economy experienced low and sometimes negative rates of growth and deteriorating real per capita income. The poor economic performance was reflected in other economic indicators such as deficits in government accounts, accelerating rates of inflation, deterioration in national savings and in the value of the national currency, and frequent food shortages.

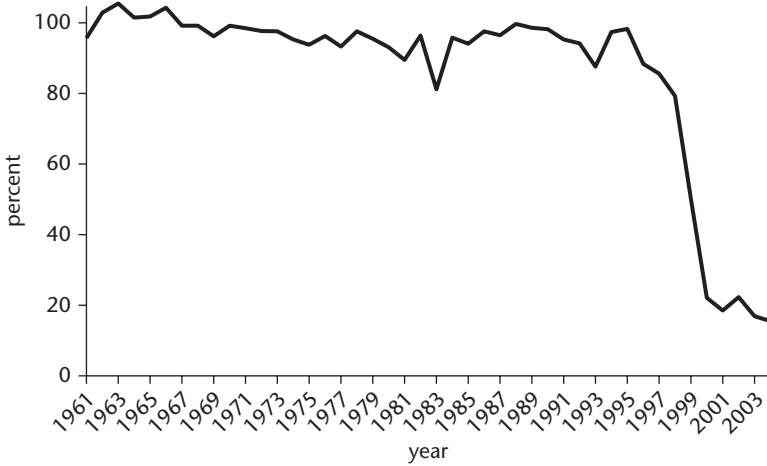
Economic development in Sudan has largely been influenced by the country's colonial history (D'Silva and Elbadawi 1988). Agriculture has always been the main sector shaping development patterns and growth throughout the economy, and the government has tended to take a paternal attitude over the whole economy, especially the production sectors through excessive regulations (FAO 1997). A major feature of Sudan's agricultural development has been its focus on expansion of irrigated agriculture and mechanized rainfed farming, a situation that started early in the colonial era and continued after independence. The vast traditional rainfed sector, which accommodates the majority of the population and contributes significantly to foreign exchange earnings, has been neglected (D'Silva and Elbadawi 1988). For example, in 2004, the traditional crop and livestock sectors received only 25 percent of total public expenditure on agriculture, which itself amounted to less than 1.9 percent of GDP (Abdalla et al. undated).

The contribution of agriculture to the country's GDP has ranged from 29 percent to 46 percent during the last half century, averaging 38 percent and surpassing in many years that of the services sector (which itself is highly dependent on agricultural activities). The share of industry was relatively low but has increased during the current decade. Growth of agricultural output has been variable and, in many years, negative. Because agriculture is the main source of economic growth in the country, overall GDP growth had been variable and low, with an annual growth rate of -0.3 percent for the entire 50-year study period.

Agriculture was also the major source of foreign exchange before the discovery of oil, contributing close to 100 percent of the total value of merchandise exports until oil exports began in 1999. Since then its share of exports has averaged around 25 percent (figure 10.1). Meanwhile, agricultural imports have been steadily increasing in value relative to exports. In the 1960s, farm imports averaged about 20 percent more than farm exports; today they average more than 100 percent (figure 10.2).

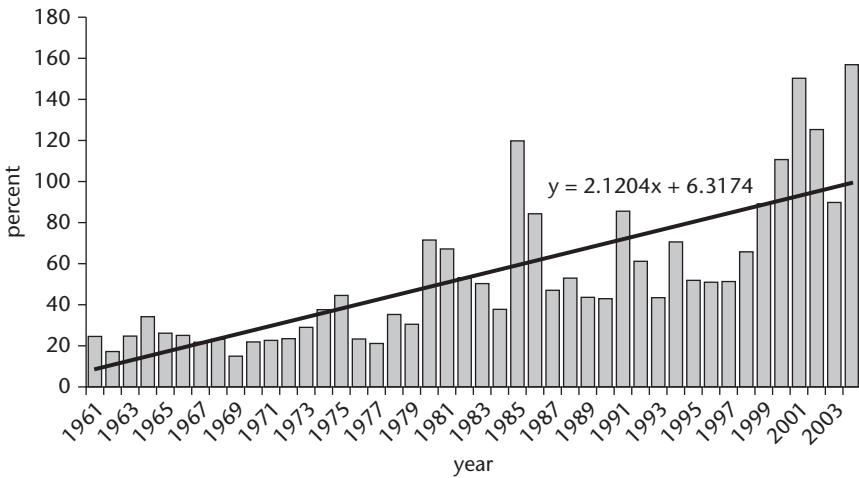
Traditionally, the export structure has been dominated by five commodities: cotton lint, sesame, groundnuts, live animals, and gum arabic. Since 1961 these five commodities have contributed between 50 and 90 percent (on average, 77 percent) of all agricultural exports (figure 10.3). Cotton led those exports—although with substantial annual fluctuations—until the early 1990s, when live animals and sesame became more important. Gum arabic has retained its importance relative to groundnuts, whose exports declined in the early 1980s, in part because of increases in processing for domestic consumption of groundnut oil. Except for some processing of oilseeds and cotton, agricultural raw material processing has been weak, hampered by poor transport and other infrastructure and shortages of essential inputs such as electricity and fuel (Ministry of Finance and National Planning 2006a, 2006b).

Figure 10.1. Share of Agriculture in All Merchandise Exports, Sudan 1961–2004



Source: Compiled by the authors using FAOSTAT data.

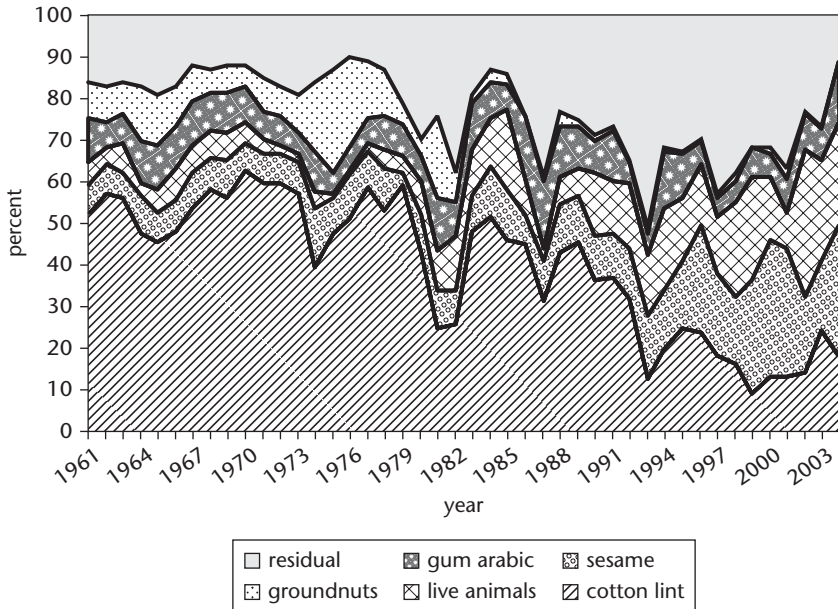
Figure 10.2. Value of Agricultural Imports as a Share of Value of Agricultural Exports, Sudan, 1961–2004



Source: Compiled by the authors using FAOSTAT data.

Note: Equation shows ordinary least squares estimate of a linear time trend, with an average annual increase in the ratio of agricultural imports to exports of 2.1204 percent per year.

Figure 10.3. Product Shares of Agricultural Exports, Sudan, 1961–2004



Source: Compiled by the authors using FAOSTAT data.

Policy Evolution and the Economy

This section summarizes the history of growth and economic policies in the Sudanese economy, delineating the periods by changes in political systems or specific economic policies and programs. This is not the place to discuss macroeconomic policies in detail; but they are crucial, and exchange rate policy in particular has been a major factor in directing the pace and path of change in Sudan's economy.

The colonial period

From 1899 to 1956, Sudan was under British colonial administration, whose policies laid the foundation of the modern economy (Abdelgadir and Elbadawi 2002). The centerpiece of this economy was long-staple cotton grown under irrigation. British colonial rule early in the 20th century involved state control over agricultural patterns of land use that largely remain in place today. A law enacted in 1903 enabled the government to acquire land by expropriating all rights, which was followed by the Land Acquisition Ordinance of 1930 that authorized the British governor general to acquire land for public purposes against payment of

compensation (Tothill 1948). Privately owned farmland remained in some areas, mostly along the Nile in the northern part of the country where land is particularly valuable, and agriculture was based on irrigation using the traditional *sagia* waterwheel.

Land acquisition allowed the colonial government to charge rent and tax private investment in pump enterprises along the main Nile north of Khartoum and in the Khartoum area, where land use was allotted to tenants using yearly leases. In northern Sudan, in response to problems of land fractionation that built up on account of Islamic inheritance rules, policy was directed to the development of government pump schemes behind *sagia* land strips. This involved attracting freeholders to sell land to the government to be reallocated on a government tenancy basis.

During and immediately after the First World War, the government opened seven major irrigation and agricultural development projects in the north, basically to feed British regiments then stationed in Egypt. These projects continue to function today, albeit with different and varying objectives and management over time. The single most far-reaching undertaking was and remains the Gezira irrigation system, which currently covers nearly 1 million hectares of land. Early steps toward establishment of the project took place in 1911, with the main objective being to produce cotton for British industry. Initially, tenants on cotton land were required to pay a fixed charge for water. Eventually a cost and profit-sharing arrangement was established between the government, the Sudan Plantation Syndicate that was then in charge of the business, and the Gezira tenants, with respective shares of 35 percent, 25 percent, and 40 percent. Those shares underwent many changes before and after independence, but the basic structure has largely remained. Crops other than cotton, once exempted from irrigation-water charges, are currently subject to such payment. The Gezira scheme served as a model for the establishment of many other government irrigation schemes, bringing the total area under irrigation to some 2 million hectares. The government, which practiced close control over the areas and the types of crops to be grown, provided most of the inputs or the financing for them. The most important crops grown under irrigation are cotton, groundnuts, sorghum, and wheat. The government still controls cotton ginning and cotton exports and has controlled wheat delivery and distribution for extended periods of time.

Agriculture formed the main source of government revenue through direct and indirect land and crop taxation and other avenues. Important types of direct taxes were levies on land, date trees, and rainfed crops. Land taxes included a tax on the estimated value of land itself and one on the gross value of crops produced. Taxes on date palms were levied exclusively in northern Sudan. Taxes known as *ushur* were levied on the produce of rainfed areas at 10 percent ad valorem, consistent with the Islamic *zakat*. However, the administration aimed at

keeping direct taxes at low levels. Over a seven-year period in the 1940s, the three types of taxes contributed only 1.4 percent to Sudan's total budgetary revenue (Tothill 1948).

Indirect taxation included two main items: royalties on gum arabic and other natural products, and customs charges. Royalties were levied ad valorem on tobacco and per unit weight on export in the case of exportables such as gum arabic. Customs duties were charged on all of Sudan's exported produce at a rate of 1 percent. Agricultural producers also contributed to government revenue through the prices paid to government monopolies, for cotton transport on inland railways, and for the import and sale of sugar. Taken together, the sum of all agricultural taxes is estimated to have accounted for about 40 percent of government budget revenue (Tothill 1948).

The 1956–70 period

At independence in 1956, agriculture dominated the Sudanese economy, contributing about 61 percent of GDP (Abdelgadir and Elbadawi 2002). The industrial sector was rudimentary, with a share of just 1.1 percent of GDP, while the services sector accounted for the remaining 38 percent of GDP. The economy was clearly dualistic in nature, with a vast traditional sector and a small modern sector—a situation that continues today.

Following independence in 1956, Sudan adopted the first in a series of development plans. The Ten-Year Plan of Economic and Social Development, 1961/62–1970/71, placed considerable emphasis on the development of agriculture, allocating about 27 percent of total public investment to the sector. This investment was driven by a campaign to combat hunger and malnutrition and to provide food and nutritional security through an import substitution program to increase production of wheat and sugar and through improvement of livestock and horticultural products. The modern irrigated subsector received the lion's share of the projects in the investment plan. The Roseires dam, 620 kilometers south of Khartoum, was the key project in a plan to enhance the water supply and thus diversify and intensify irrigated cropping. The plan also sought to expand sugar production by 25 percent. The economy in general was stable compared with that of the 1970s and beyond, but imports started to expand in quantity and value, resulting in trade deficits.

The 1970s and 1980s

In the early 1970s, the Sudanese government and the governments of some Persian Gulf states saw Sudan as a potential food basket for the Arab world. Sudan's

agricultural strategy thus shifted its emphasis from production of cotton and other nonfood crops toward food production and export, using Arab funds and western technology to produce wheat, sugar, livestock, and textiles for export and to promote sugar and wheat as import substitutes. This was planned within the framework of the Five-Year Plan of 1970/71–1974/75, which later was extended to 1976/77. Key objectives of the plan were to adopt a socialist development path to achieve average annual GDP growth of 8 percent, raise agricultural production by 61 percent, increase livestock production by 75 percent, increase industrial production by 57 percent, and satisfy national demands for food.

Implementation did not follow the plan, however; investment was diverted from agriculture to the transport and communications sectors, and the majority of the projects were not completed. Overall GDP growth for the period was only 4 percent. Not only did Sudan miss its planned targets on food import substitution, but discrimination in Sudanese policy against export crops, particularly cotton, caused real exports to decline by 13 percent between 1970 and 1977. In 1974, a sharp increase in the price of fuel and capital goods increased the cost of imports by more than 100 percent, leading to mounting deficits in the current account of the balance of payments.

During the late 1970s, Sudan's economy began to experience severe, interdependent structural problems that inhibited economic growth. The internal sector had long suffered from excess aggregate demand resulting in inflationary pressures in the economy. The situation was further aggravated by the devastating effects of a civil war in the south and frequent incidence of drought. The external sector experienced a continuous deficit in the balance of payments, and foreign debt mounted. Exacerbating these problems was the government's approach to the economy, which included confiscation and nationalization of industrial and agricultural firms and banks and a diminished role in economic activities for the private sector. During this period the government set prices for production, exports, imports, and consumption goods in addition to putting controls and restrictions on import and export quantities. Furthermore, the government expanded the public sector, which was often criticized for its inefficiency and poor performance.

To address these issues, the government launched a series of development plans and programs, the most important of which was an economic recovery program. Its major targets were the adoption of a more realistic exchange rate, reduction of quantitative restrictions on exports, and removal of export taxes. The Sudanese pound was devalued, and attempts were made to adopt tighter demand-management policies. The potential effects of these policies were undermined, however, by rising inflationary pressures. Between fiscal 1978 and fiscal 1984, the official exchange rate was devalued by 14.5 percent a year on average, whereas domestic inflation averaged 27 percent a year (Hag Elamin and El Mak 1997).

A number of sector-specific policies were implemented in agriculture, the most important being the introduction of the individual account system of production relations in the Gezira scheme in 1981,³ general rehabilitation of the major public agricultural schemes, reduction of agricultural export taxes, and the dismantling of the parastatal Oilseeds Company's monopoly on oilseeds exports.

Despite these policy reforms, a host of other policy variables were left untouched (Hag Elamin and El Mak 1997). The government, through its agricultural public corporations, continued to control the irrigated sector. These public corporations dictated crop rotations, varieties to be grown, and input quantities, and set farmgate prices for cotton, wheat, and gum arabic. The corporations also continued to recover their land and water costs for all crops through their control of cotton marketing, which made cotton relatively less profitable than other crops. The state also continued its marketing monopoly for principal export commodities such as cotton, gum arabic, and oilseeds but failed to achieve its major objective of stabilizing producer prices. At the same time, the export monopoly dampened incentives for producers by paying them low prices compared with international levels.

The Agricultural Bank of Sudan (ABS) was the principal supplier of formal credit to agriculture, while informal lenders dominated rural financial markets in Sudan. The bank's credit was channeled mainly to a limited number of large-scale farmers who could provide collateral. But the bank was nonetheless unable to recover on many of its loans. It also experienced high administrative costs, interest rates fixed at negative real values, capital erosion, poor coordination, and inadequate supplies of loanable funds. The other source of formal credit to agriculture was the Bank of Sudan, which provided loans to farmers through the public corporations. In most cases, farmers receiving the loans treated them as a subsidy from government that did not need to be repaid, and so the public corporations accumulated debt, a factor that contributed significantly to their inefficiency. All other banks' credit to agriculture was negligible, however, because they concentrated on financing industry and foreign trade.

The economy in general, and agriculture in particular, was crippled by a series of cumbersome bureaucratic procedures such as import licensing, registration of exporters, reporting of stocks, and restrictions on crop movements, all of which greatly discouraged production and exports. Moreover, domestic policies were unstable; for example the government monopoly over oilseeds was abolished and then reinstated. Further, a host of exogenous negative shocks, including civil war, drought, and famine, and an influx of refugees from neighboring countries, coincided with the implementation of the adjustment policies in 1978–85. The performance of the economy was poor under the economic recovery program—GDP growth declined to 2.2 percent, the government budget deficit tripled, the rate of

inflation rose to an annual average rate of over 27 percent, and the balance of payments continued to deteriorate (Hag Elamin and El Mak 1997).

The 1986–89 period

The economic recovery program ended in April 1985, when a civil uprising, mainly driven by poor economic conditions for the majority of the population, led to a political change in the government. In 1987, the newly elected government, together with the World Bank and the International Monetary Fund, prepared an action program. Under the program, the exchange rate was unified and devalued by 44 percent, and a compensatory rate (in lieu of interest rates, which are forbidden under Islamic law) was introduced within the Islamic banking system, with effective lending rates pegged at 3 percentage points above the annualized quarterly rate of inflation. To encourage production, the pre-season announcement of prices was expanded to include additional commodities. There were also substantial increases in the consumer prices for fuel (25 percent), sugar (66 percent), cement (33 percent), and other basic commodities previously provided with indirect subsidies (through the multiple exchange rate system) or direct subsidies (through the central government's budget and pricing policies).

These policy measures led to trade union strikes and street demonstrations, which forced the government to declare the action program inoperative. Partial adjustments made before 1989 were associated with increased inflation, underuse of capacity, stagnant economic growth, and a heavy dependence on food aid and external foreign assistance. A change in the political regime in 1989 led to another new formulation of economic programs.

National Economic Salvation Program policies, 1990–93

In response to the woes of the late 1980s, the government embarked on a three-year (1990–93) National Economic Salvation Program that aimed to reallocate available resources in favor of the production sectors, particularly agriculture. Objectives included food self-sufficiency, food security and social equity, liberalization and deregulation, removal of administrative and legal barriers to agricultural exports, private sector enhancement, and financial and social stability (Hag Elamin and El Mak 1997). Vulnerable segments of the society would be targeted for social welfare programs to alleviate adverse effects of adjustment. General economic reforms were directed at foreign exchange, trade, fiscal, and monetary policies. The nominal exchange rate was devalued (Abdelgadir and Elbadawi 2002), but recognizing the adverse effects of foreign exchange liberalization on prices of

imported inputs, the government adopted a preferential exchange rate (between the official and market exchange rates) for the import of essential inputs.

The program also sought several specific agricultural objectives, including:

- The removal of subsidies on goods and services provided by the production corporations, mainly fertilizers, insecticides, land, and water.⁴ Significant reductions in subsidies on food products were also planned.
- The lifting of government price controls and regulations on agricultural commodities. The government would continue to set a minimum procurement price for wheat.
- An end to the monopolies held by the public marketing parastatals, namely, the Oil Seeds Company, the Livestock Marketing Corporation, and the Cotton Company.
- A freeze on the role of the Ministry of Commerce in setting product prices; ministerial committees were to be formed to oversee a set of flexible signal prices.
- A reduction of export taxes to 5 percent for all exports except cotton and gum arabic, for which export taxes were reduced to 10 percent.
- A shift in financing from the agricultural public corporations to a consortium of commercial banks, with higher credit ceilings and expanded services for agriculture, including the establishment of new specialized banks and adoption of Islamic forms of lending.
- Revision of the 1990 Investment Encouragement Act to include more concessions and privileges to attract national and foreign investment.
- Reform of government administrative structures to cope with liberalization policies and to enhance the role of the private sector.

Reform policies since 1993

Under the 1992 liberalization policy, previous controls that negatively affected the private sector role were abandoned. The most significant of those was the yielding of export earnings to Sudan's central bank at overvalued official rates, while domestic prices and access to foreign exchange were subject to black market conditions. The reform policy after 1992 seemed to be implemented consistently and rapidly and reflected a continuing relaxation of restrictions on foreign exchange, credit, and product prices; a high rate of privatization of state-owned enterprises; attraction of foreign direct investment; wide abolition of subsidies; reduction of direct agriculture taxation; and introduction of a value added tax to replace production taxes.

Following the reforms of 1992, GDP growth improved significantly, rising from 1.2 percent during the 1980s to a high of more than 10 percent in the early

1990s. Favorable natural conditions contributed to improved agricultural production, but rapid growth was accompanied by high rates of inflation, deterioration in the value of the local currency, and rising costs of production, associated with a significant increase in the money supply and high government borrowing from the banking system. This macroeconomic situation offset the benefits from potential positive production; by 1996, GDP growth had fallen back to 4.7 percent, and features of former economic crises started to recur. According to Sheikh Musa (2001), the deterioration in the economy in 1996 could be attributed to the previous structural problems that had not been corrected along with poor implementation of financial and monetary reforms. Efforts were made to ease structural problems but insufficient account was taken of interrelationships between sectoral policies, macroeconomic policy, and economic growth.

In 1997, the government undertook a more comprehensive economic and structural reform program monitored by the International Monetary Fund. The objectives of this program were the removal of exchange rate distortions along with the formulation of financial and monetary policies to remove negative performance of the current account and the increased rate of inflation; the normalization of relations with regional and international financial organizations as steps to improve the flow of external financial resources needed to rehabilitate the basic infrastructures of the production sectors; and the abolition of the speculative marginal activities in foreign exchange, automobile, crop markets, and other strategic commodities. The program was implemented in three stages: a short-term (second half of 1996) fiscal shock program to remove the distortions in the financial and monetary sectors and ease the pressure on aggregate demand and demand on foreign exchange; a one-year (1997) program of financial and monetary reform with a component of social support to mitigate the negative effect of liberalization; and a subsequent one-year (1998) program aimed at increasing aggregate supply to narrow the gap with aggregate demand, in addition to expansion of social programs.

By the end of 1996, the economy started to respond positively to the reform program, and by the end of 1998, economic indicators were showing clear gains. Real economic growth averaged 6 percent for the year, the annual rate of inflation fell to 17 percent, the current account deficit declined to 4 percent of GDP, the budget deficit dropped to 0.5 percent of GDP, annual growth in the money supply declined to 19 percent, and export volumes increased.

Building on the positive results of these reform programs, and to maintain and consolidate the economic gains achieved, a follow-on program for 1999–2002 was designed and implemented with the support of the International Monetary Fund. The main features and agenda of that program were comprehensiveness in targeting all aspects of economic liberalization, capacity strengthening of human resources and infrastructure, development of social services, and normalization of

external relations to attract foreign support. Considerable gains were realized in overall economic stability through recapturing the balance between aggregate demand and supply, lowering the rate of inflation, converting the foreign exchange rate system into a more realistic, single free-market rate, and increasing overall growth, which reached 8 percent in 2000.⁵

It can be argued that, after more than a decade of liberalization, Sudan has still not managed to put in place adequate practical policy measures and institution-building mechanisms to promote outward-looking and proactive private sector strategies. For instance, it has not moved to privatize noncore activities or to free up markets (particularly for key export commodities such as cotton and gum arabic) so as to enable the private sector to procure all its needed inputs at competitive world market prices. As a result, despite the macroeconomic and sectoral reforms described above, the outlook for future growth remains uncertain.

Estimates of the Changing Extent of Distortions

With this policy history as background, the rest of this study focuses on estimating the extent to which prices facing farmers have been distorted over the past 50 years, generating an antiagricultural bias and, within the sector, an antitrade bias. The methodology adopted is the standard one for this project (see appendix A and Anderson et al. 2008), which seeks to measure the government-imposed distortions that create a gap between domestic prices and what they would have been under free markets. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in nonagricultural sectors for comparative evaluation.

More specifically, this study computes a nominal rate of assistance (NRA) for farmers by calculating the difference between the prices actually paid to domestic producers and what those prices would have been under free market conditions. No adjustment is made for interventions on input markets, because of a lack of data. The study also provides an NRA for nonagricultural tradables, for comparison with the NRA for agricultural tradables through the calculation of a relative rate of assistance (RRA).

Twelve commodities have been identified based on their contribution to the country's value added. Grouped into relevant categories, these are import-competing products (wheat, sugar, and milk), exportable cereals (sorghum and millet), exportable oilseeds and oils (sesame and groundnuts), exportable livestock (live sheep, cattle, camels, and goats), and lightly processed exportables (cotton lint, cleaned gum arabic, and cheese). Together these commodities have

contributed 80–90 percent of the value of agricultural output, with most of the rest being shared by a wide range of vegetables and fruits. Data for the analysis were collated from various secondary sources for the period 1955 to 2004, as detailed in the appendix to Faki and Taha (2007). Throughout the five decades, milk and beef cattle made the biggest contributions to the value of production, followed by sheep and goats and (before the 1990s) cotton. Sorghum has been the most valuable grain, followed by millet, while groundnuts and sesame have been equally valuable contributors to oilseed production. Gum arabic, while important in exports, has contributed only 1 or 2 percent to the value of production. The consumption shares are similar, making animal products unusually high for such a low-income country.

Nominal rates of assistance

Our estimates of commodity assistance rates are summarized by five-year time periods in table 10.1, and annually in aggregate form in figure 10.4. In most periods, the importable commodities (wheat, sugar, and milk, making up about one-fifth of the value of farm production) enjoyed positive direct assistance. Not surprisingly, when international food prices spiked in 1973–74, their domestic prices did not respond fully, and so the NRA for this subgroup became as negative as for exportables. But its average NRA was much higher than that for exportables, implying a strong antitrade bias within the sector throughout the past half century. Among the exportables, the cash crops such as gum arabic and sesame, together with live animals, have been the most heavily taxed, and the staple foods (sorghum, millet, and groundnuts) the least heavily taxed. The NRA estimates for the various covered products, including those for the exportable and import-competing sectors, fluctuate a great deal over time (see figure 10.4). But in terms of trends, the 10-year average NRAs for covered exportables became ever more negative until the mid-1990s. Since then, however, the extent of implicit taxation has fallen, from 65 percent in 1990–94 to 34 percent in 2000–04.

The noncovered products (mostly fruits and vegetables, whose markets are not subject to government intervention except through exchange rate distortions), account for between 10 and 20 percent of the value of agricultural production. Taking these noncovered products into account makes the estimated total NRA for the agricultural sector somewhat less negative (top of table 10.2).

The middle rows of table 10.2 show the estimated NRAs for tradable agriculture and the nonagricultural sectors, from which the relative rate of assistance is calculated. That RRA is an indicator of the percentage by which the prices of farm relative to nonfarm outputs have been distorted from their free market levels. The RRA has been quite negative, moving from around –15 percent in the 1950s to –45 percent by the early 1970s, before becoming less negative through to the end

Table 10.1. NRAs for Covered Farm Products, Sudan, 1955–2004
(percent)

Product indicator	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Exportables	-22.3	-35.4	-43.4	-51.1	-37.7	-38.5	-58.1	-64.8	-41.8	-34.2
Sorghum	-35.3	-48.8	-39.9	-54.3	-39.7	-48.6	-23.8	75.5	-20.9	-10.9
Millet	-76.8	-73.2	-71.9	-41.2	-18.6	-6.2	7.9	76.2	8.7	0.4
Groundnuts	-41.2	-55.3	-51.7	-59.8	-59.0	-55.4	-33.3	-36.1	-52.2	-28.9
Sesame	-40.3	-52.5	-63.6	-65.3	-67.8	-59.5	-48.4	-48.1	-49.9	-38.1
Cotton	7.8	4.9	-11.8	-10.2	-7.4	2.1	-1.0	-31.9	-10.3	17.0
Gum arabic	-33.3	-33.4	-42.0	-58.5	-47.4	-61.1	-66.7	-57.3	-59.8	-67.1
Livestock	-10.5	-40.1	-51.1	-59.5	-34.2	-34.1	-67.1	-76.7	-47.5	-30.0
Sheep	-33.9	-53.2	-55.8	-66.7	-51.0	-43.9	-61.7	-76.7	-61.4	-37.4
Cattle	-2.4	-36.2	-44.8	-59.8	-31.9	-32.6	-61.9	-74.5	-42.9	-45.1
Camels	5.3	-38.8	-61.7	-34.4	29.6	0.7	-69.3	-85.3	23.6	87.7
Goats	20.0	-8.4	-38.1	-60.2	-43.1	-32.6	-59.4	-53.7	-50.6	-13.3
Import-competing products ^a	19.1	19.2	-11.4	-35.7	23.4	-9.3	65.3	-21.2	-6.8	35.8
Wheat	10.1	4.9	0.6	-35.6	10.6	-6.5	31.5	58.8	-19.8	22.2
Sugar	—	42.4	41.2	45.2	26.5	-35.7	-16.5	-20.1	-24.4	120.5
Milk	19.4	19.0	-16.2	-41.1	26.5	-3.5	79.2	-33.1	-1.9	29.3
Total of covered products ^a	-15.9	-25.4	-36.8	-48.5	-28.3	-32.9	-38.9	-53.9	-29.2	-14.6
Dispersion of covered products ^b	33.6	34.2	32.9	35.0	38.8	31.1	52.5	72.3	40.5	60.9
Percent coverage (at undistorted prices)	75	80	86	90	86	89	91	87	85	83

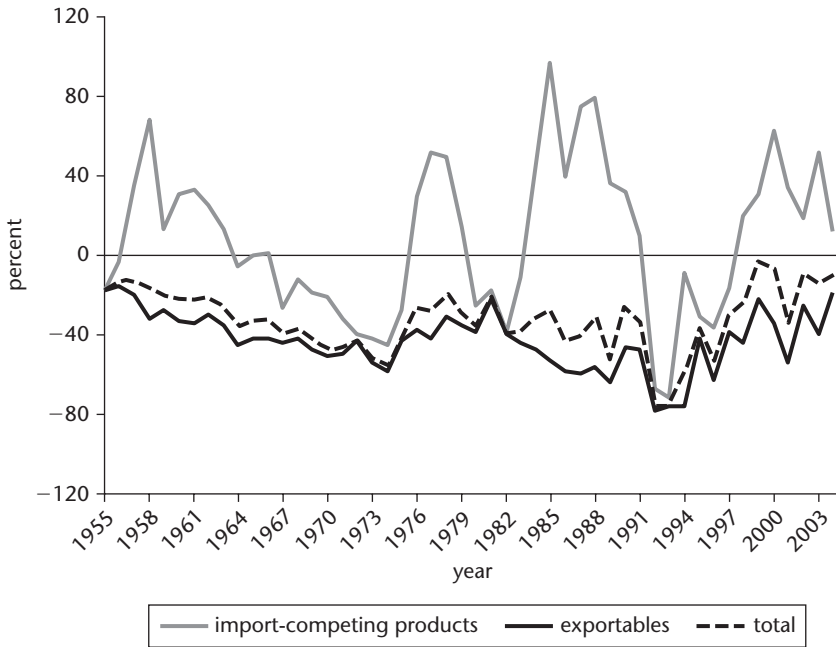
Source: Data compiled by the authors.

Note: — = no data are available.

a. Weighted averages, with weights based on the unassisted value of production.

b. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

Figure 10.4. NRAs for Exportable, Import-Competing, and All Farm Products, Sudan, 1955–2004



Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

of the 1980s as international food prices fell after their spike in 1973–74. Then the RRA repeated that cycle, becoming more negative in the first half of the 1990s before the policy reforms began to take hold in 1993. After that, the RRA moved much closer to zero at –18 percent in 2000–04 (and just –9 percent in 2004), compared with –56 percent a decade earlier. While the negative RRA means an antiagricultural bias is still present, the reforms have driven that intersectoral distortions indicator to its lowest level in the 50 years (figure 10.5).

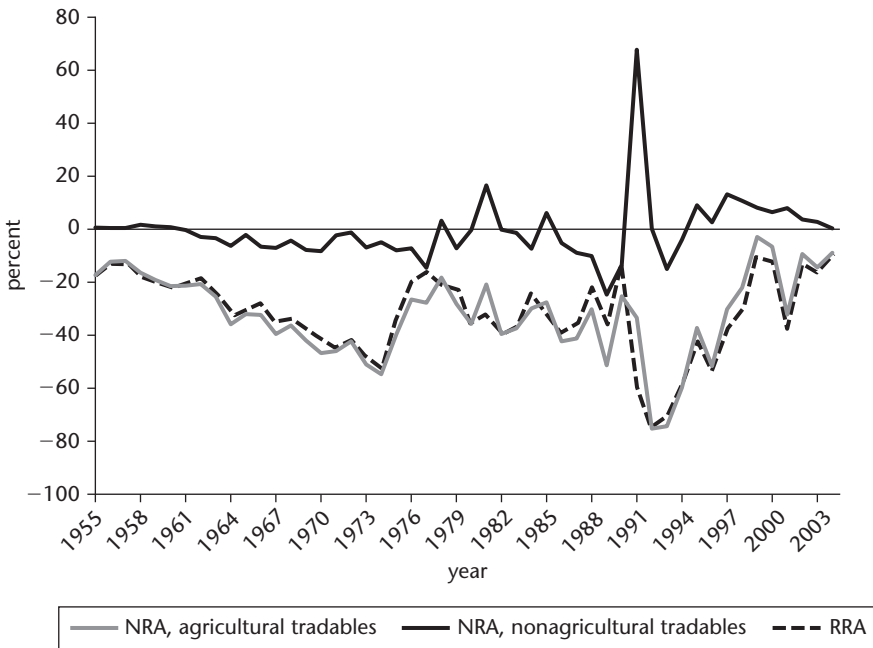
The bottom rows of table 10.2 show what three of these indicators would have been if distortions in the market for foreign exchange had been ignored in our calculations. They reveal that before 1993, up to one-third of the NRA for the overall agricultural sector was attributable to exchange rate distortions, and even more to the antiagricultural trade bias. Only a small fraction of the RRA stems from that distortion though, reflecting that the exchange rate impacts on all tradable sectors and that the sizes of those impacts depend on the shares of the import-competing and exportable subsectors in each sector.

Table 10.2. NRAs in Agriculture Relative to Nonagricultural Industries, Sudan, 1955–2004
(percent)

Indicator	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRA, covered products	-15.9	-25.4	-36.8	-48.5	-28.3	-32.9	-38.9	-53.9	-29.2	-14.6
NRA, noncovered products	0.8	0.6	0.5	0.3	0.4	0.5	0.2	0.4	0.8	0.9
NRA, total, all agricultural products	-11.7	-20.3	-31.8	-43.4	-24.3	-29.3	-35.4	-47.7	-24.5	-11.9
Trade bias index ^a	-0.30	-0.45	-0.36	-0.24	-0.46	-0.26	-0.74	-0.48	-0.35	-0.50
NRA, all agricultural tradables	-15.4	-24.9	-36.4	-48.1	-28.0	-32.6	-38.5	-53.6	-28.8	-14.2
NRA, all nonagricultural tradables	0.9	-2.4	-5.6	-4.7	-6.7	1.5	-8.5	7.1	8.8	4.2
RRA ^b	-16.1	-23.2	-32.7	-45.6	-22.7	-33.5	-32.9	-55.4	-34.7	-17.5
Memo item, ignoring exchange rate distortions:										
NRA total, all agricultural products	-7.9	-14.5	-24.8	-34.9	-13.4	-18.1	-15.8	-38.2	-23.2	-11.9
Trade bias index ^a	-0.17	-0.26	-0.05	0.21	-0.14	0.11	-0.51	-0.03	-0.30	-0.50
RRA ^b	-16.1	-23.1	-33.7	-44.8	-18.8	-28.6	-23.3	-56.4	-33.7	-17.6

Source: Data compiled by the authors.

- a. Trade bias index is $TBI = (1 + NRA_{agx}/100)/(1 + NRA_{agm}/100) - 1$, where NRA_{agm} and NRA_{agx} are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.
- b. The RRA is defined as $100 * [(100 + NRA_{agt}) / (100 + NRA_{nonagt}) - 1]$, where NRA_{agt} and NRA_{nonagt} are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors respectively.

Figure 10.5. NRAs for All Agricultural and Nonagricultural Tradables and the RRA, Sudan, 1955–2004

Source: Data compiled by the authors.

Note: For a definition of the RRA, see table 10.2, note b.

The Evolution of Policy Choices

The analysis of the NRAs and RRAs reveals a legacy of highly discriminatory distortions to Sudanese agricultural production and trade, but no consistent long-term policy trend up to 1993. The variability in the NRAs was influenced by ad hoc agricultural policies, with the movement toward freer markets (less antiagricultural bias and, within agriculture, less of an antitrade bias) often being short-lived.

The increasing antiagricultural bias (increasingly negative RRAs) from the late 1950s up to the early 1970s was associated with ambitious but unsuccessfully implemented development plans that focused on an import substitution agenda. The notable improvement from the mid-1970s to the late 1980s is attributable to the attention and support to agriculture from the socialist regime, when government control of the economy sought to boost food production. Nevertheless, these policies were more favorable to import-competing farm products than to exportables, discriminating in particular against cash crops. Distortions were

affected by exchange rate volatility and fluctuating policies toward public marketing parastatals, engendering low and unstable producer prices. The trend toward less discrimination against agriculture, noticeable since 1993, was mostly governed by progressive implementation of macroeconomic reforms. Throughout the whole 50-year period, few covered products had NRAs close to zero; the main exception was cotton.

Import-competing products

The pattern of the NRA for wheat was influenced by slow responses of the government to changes in international prices, and by import-substitution policies especially from the mid-1970s through the 1980s (UNDP 2005). Among import-competing crops, there were periods of high NRAs in the late 1970s, the 1980s, and again in the late 1990s through 2004. These high rates of assistance were influenced by the exchange rate regime and price controls on some goods, while others experienced high inflation (UNDP 2005).

The data shown in table 10.1 refer to primary agricultural production but are influenced by policies to encourage domestic wheat flour milling and other processing activities. For example, milling and importing of sugar are undertaken by a government monopoly that accounts for a substantial share in government budget revenue. The discrepancy in price levels between factory and consumer prices includes an implicit tax on production and consumption.

Milk is exclusively consumed in the domestic market and its prices respond sluggishly to changes in the international market. Other variations in the NRA for milk, including the peaks during the second half of the 1970s and the second half of the 1980s, can be traced to natural conditions that influence milk production and trigger high domestic prices. Another factor that affects the estimated levels of distortions is the nature of price comparisons between fresh and dry milk on the one hand, and local and imported cheese on the other hand. Although these were substitutes, the calculation of their relative prices might be subject to errors.

Exportable cereals

Trade in sorghum was once subject to a strict discipline on the ground that the crop is the major staple food in the country. Control of sorghum trade is now relaxed, but the government still limits sorghum exports from time to time. The situation is intermingled with food aid, which often includes sorghum.

Millet is not a very important export commodity, and its local consumption is concentrated in certain areas, mainly western Sudan; as a result, government intervention seems to be quite limited. The trend in the rate of assistance is

upward, although one needs to keep in mind that domestic prices during 1955–65 and export prices in the 1990–2004 period were based on extrapolated estimates. The high rates of assistance around 1990 were again a result of exchange rate movements interacting with lags in local market adjustments. By and large, the pattern of assistance appears to be influenced by exchange rate movements and domestic market constraints, especially transport-related infrastructure.

In general, and despite the differences in the rates of assistance between the two cereals, their overall patterns have been similar. While some substitutability in consumption exists between the two products, it seems that they are influenced also by similar policy measures.

Exportable oilseeds and oils

For oilseeds (sesame and groundnut), distortions became more negative until about 1980 as a result of exchange rate distortions. But trade in oilseeds was highly affected during this period by the nationalization of oilseed exports in 1970 and the transfer of trading functions to the parastatal Sudan Oilseeds Company (FAO 2004). Their monopoly was later abolished in 1980, reintroduced in 1986, and finally removed in 1991, but the company continued to compete with the private sector during periods of demonopolization. When the monopoly was in operation, minimum producer prices were set to encourage production, but financial resources often ran short, and the company could not always meet the payments needed to maintain those prices.

Exportable cotton

Rates of assistance to cotton, although variable, reflect a reasonable alignment of domestic and export prices. The pattern of the NRAs for cotton is dictated by the setting of producer prices by the government. The periods of negative NRAs were influenced by a change in the cotton export-market policy from the fixed-price system to a system of tenders (Bank of Sudan 1975). A drastic reduction in the area planted to cotton in the first half of the 1990s may have been driven by the declining NRA at that time, but it also coincided with the government's objective of increasing food crops in the irrigated sector to boost food security. The increase in assistance since the early 1990s is associated with the liberalization policy under which the official exchange market and foreign exchange retention policies were abandoned (Bank of Sudan 1992).

Exportable gum arabic

Gum arabic is clearly and consistently taxed. A private monopoly controlled trade in the commodity until 1969, when the government took over. Floor prices are

announced and are usually far below export border prices. Until the later 1990s, the commodity was subject to relatively high direct export taxes as well. For both reasons the estimated NRA is highly negative. A recent report on the Gum Arabic Company (Khalid 2006) indicates that inland en-route fees and charges reached 40 percent in recent years. If trader costs are increased to this level, the farm NRA will still be negative, but with an overall average of about 42 percent instead of about 53 percent for the whole period. That difference is attributable to market failure more than to government policy distortions. This situation is unfortunate for farmers but less so for the nation as a whole, given that Sudan is the world's main gum arabic producer and so has some influence on the international price.

Exportable livestock

The level of producer assistance to livestock production reflects government intervention through export licensing. The implied level of taxation was reduced from 1992, when export earnings became a more important government objective. Other state intervention in prices and marketing activities has been quite limited (Hussein 2004).

Modalities for the promotion of livestock marketing and exports include the establishment of a parastatal Livestock and Meat Marketing Corporation in the mid-1970s that provided various marketing services. It was dissolved in 1992, and most of its functions were transferred to the Animal Resources Services Company. Estimated NRAs also capture market failure relating to monopolistic competition among traders. The NRAs also are responsive to exchange rate regulations: up to the early 1980s when exchange rate distortions were low, so were the negative levels of the assistance rate, but during the 1980s and the beginning of the 1990s, exchange rate distortions reflected more negatively on producers. The rate of assistance during 2002 and 2004 might have been affected by a monopoly situation of livestock exports granted to the Gulf Livestock Company owned by a Saudi prince through an exclusive export agency agreement, under which export prices were fixed. The agreement faced local resistance and was dissolved in 2004 (Hussein 2004).

Prospects for National Policy Reform

For many years the Sudanese government has targeted the development of the agricultural sector, with limited success. While many investments were undertaken, it is evident that malfunctioning markets have limited agricultural performance. This is partly attributable to government intervention in markets through the fixing or influencing of prices, control over production and product delivery and disposal, and excessive internal taxation of products. There are also

indications of monopolistic behavior, which is partly government induced. However, many exchange rate controls that had long been in place have recently been removed. It remains for the other distortions to agricultural incentives to be reduced. Some potential policy actions to help achieve that are canvassed in this final section.

One potential action is to continue the ongoing foreign exchange rate policy reform with the aim of allowing the real exchange rate to reach its natural equilibrium. This will not be easy while trade measures that restrict exports are still in place. More generally, the risk of appreciation in the exchange rate (such as in 2006 when it appreciated by about 20 percent) will always raise concerns among exporters about the sustainability of their competitiveness when selling on world markets.

A second useful action would be to deregulate state and state-induced market monopolies, especially in gum arabic and cotton, to open up more export opportunities for the private sector. The government is now moving in this direction: the gum arabic monopoly is in the process of being abolished, and the private sector can now engage in cotton exports from irrigated areas in addition to the previously permitted private exports of rainfed cotton. Wide involvement of the private sector in trade is, however, limited by the availability of finance and trade information, both of which need relevant policy action. Another requirement is quality assurance of some export products for which Sudan has a big share in the international market, especially gum arabic, sesame and, to some extent, sheep. Regulations setting quality standards as well as a strong institutional arm for implementation will be conducive to competitive export promotion. These are being prepared within the context of Sudan's accession to the World Trade Organization (WTO).

Third, domestic monopoly-like practices should be removed via policy interventions to promote finance from public and private sources, and training should be encouraged to empower newcomers in commerce.

Fourth, the recent trade reform process should be encouraged to continue. It has involved the removal of export taxes, as well as a review of the import tariff structure in the context of negotiating Sudan's accession to the WTO. Such reforms should be aimed at raising efficiency by lowering the average tariff and its variance across industries, but with reasonable implementation periods to allow improvements in productivity to be reached.⁶

And fifth, given the high dominance of primary products in Sudan's export portfolio, investments in infrastructure and agricultural research, and the efficient provision of complementary services, are essential if enough quantities and quality of raw materials are to be forthcoming to stimulate an expansion in processing activities.

Of great importance to all of these policy recommendations is the adoption of a stable strategy of policy reforms that is nevertheless flexible enough to respond to internal and external changes. Such stability is needed in view of the past frequent policy shifts that have not only depressed agricultural incentives but also added to the natural uncertainty that is inevitably associated with agricultural production.

Notes

1. Studies of macroeconomic policy issues affecting Sudanese agriculture include Hag Elamin and El Mak (1997), Abdelgadir and Elbadawi (2002), and Amal (2006). Analyses of the comparative advantage of some farm products and related policy issues include Hassan and Faki (1993); Hassan, Faki, and Byerlee (2000); and Faki, Gumaa, and Ismail (1995).

2. Sudan's initial offer during its World Trade Organization accession negotiations on agricultural tariffs averaged 45 percent.

3. Before 1981, the cotton accounts system entailed placing cotton proceeds in a joint account from which cotton production costs were deducted and the balance divided between the three partners: the government, the scheme administration, and the farmers. Because it was believed that such a system did not provide adequate incentives for farmers to produce, an individual account system was set up, whereby individual accounts were provided for each farmer to accommodate his/her costs and revenue (Suliman 2002).

4. It might be argued that such subsidies were a result of the overvalued exchange rate, the progressive amendments of which have led to the rise in their prices. There were no explicit subsidies on inputs.

5. An analytical overview of the main macroeconomic indicators in the period 1960–98 is given by Abdelgadir and Elbadawi (2002). Despite a relatively favorable policy situation in the period 1960–73, growth was negative, while positive growth with a fairly high average per capita growth rate was recorded for the following period, even though that period's associated policy indicators were deteriorating. According to the authors, one possible explanation was that, except for the overvaluation index, the other two policy indicators were on the safe margins: the two-digit inflation rate was low compared to the threshold 40 percent inflation rate considered detrimental to growth, and the budget deficit was slightly above the 5 percent threshold. Further deterioration of the policy indicators, except for the budget deficit, was associated with negative growth during the period 1984–94. This was the period when the country was very unstable both in terms of politics and economics. The noticeable improvement in the policy indicators since 1994 was also reflected by positive growth in real per capita GDP.

6. The current structure of Sudan's tariff on agriculture can be found in the applied tariff and the bound tariff offer prepared by Sudan's Commission for WTO affairs in connection with Sudan's WTO accession process. The 2006 average applied agricultural tariff is 31 percent, with all tariff lines in the 0–45 percent tariff range. A modified bound tariff offer averages 44.9 percent in which 64 percent are within the 0–40 percent tariff range and 93 percent of the tariff lines in the 0–60 percent tariff range. This would provide more opportunities for protecting domestic producers if prices were to fall internationally.

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TANZANIA

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Following independence in 1961 (as Tanganyika, which united with Zanzibar to form Tanzania in 1964), Tanzania experienced a relatively brief period when the share of agriculture in gross domestic product (GDP) declined as resources were shifted into other sectors with potentially higher value added. Between the early 1960s and the early 1970s, agriculture's share of GDP fell from about 60 percent to just below 40 percent. It then grew slowly to just over 40 percent of GDP by the late 1970s and rose steadily back up to about 60 percent of GDP by the late 1980s and early 1990s before once again dropping back to around 45 percent (World Bank 1994). In this sense, Tanzania has yet to achieve or complete the traditional "structural transformation." Balanced growth is said to have been achieved if agriculture becomes increasingly commercialized while the manufacturing sector grows. Initially manufacturing may be based on agriculture, through processing and agribusiness, but ultimately manufacturing and the economy will become diversified (Thirlwall 1986). This diversification has not happened in Tanzania, and the economy remains essentially based on agriculture.

Given the major importance of agriculture to the country, this chapter provides an analysis of the combined effect of various government policies (in particular taxes and exchange rates) and features of the agricultural sector (notably inefficiencies in the input supply and product marketing chains) on incentives to production in agriculture. The next two sections provide an overview of agricultural performance and relevant policies since independence. Then the methodology applied to

* The authors are grateful for helpful comments from Kym Anderson, Henry Gordon, and, specifically on cotton, Colin Poulton, as well as from workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Morrissey and Leyaro (2007).

measure distortions faced by agricultural producers and consumers is described, after which the results are discussed.

The analysis reveals that while some reforms have significantly reduced distortions for some crops, many others still face high distortions, including, most worryingly, the two major food crops, maize and rice, which together account for more than 40 percent of agricultural output. Although exchange rate liberalization and privatization of marketing has removed many distortions, marketing inefficiencies and limited competition persist for many products, so the level of distortion against agriculture remains reasonably high for all tradables on most of the measures used. For exportables overall, part of the remaining high distortion is attributable to high distribution and marketing costs, stemming, for example, from inefficient marketing structures and high transport costs faced by exporters. For food crops (import-competing products), persistent distortions are attributable to inefficiencies in the domestic marketing chain or monopoly power in processing and purchasing, or both. Although reductions in distortions to many crops have to some extent been offset by persistent high distortions facing others, especially certain exports, the overall bias against agriculture has been reduced.

Brief conclusions are offered in the final section. Reforms—especially liberalization of the exchange rate regime and reductions in trade taxes—have been moving in the right direction, but much remains to be done to improve the efficiency of marketing (including transport) and thus eliminate the net distortions against agriculture. The core problem is that effective real producer prices remain low, especially given high costs of inputs and inefficiencies in marketing. For coffee, government policy distortions have been largely eliminated, so the major traditional export crop now faces a neutral policy regime, but domestic prices appear insufficient for profitable trading margins, given the decline in the world price (and there is evidence of declining production).

Growth and Structural Changes

Tanzania experienced fairly steady economic growth from the mid-1960s to the mid-1970s, with real GDP increasing by almost 4 percent, although real agricultural GDP grew at only just over 2 percent. Performance weakened in the latter half of the 1970s, partly in response to external shocks and partly to increasing state intervention in the economy, including widespread nationalization. Between 1976 and 1980, real GDP rose by just over 2 percent, but real agricultural GDP grew by less than 1 percent. The combination of the 1979 oil price shock and the war with Uganda precipitated an economic crisis, with negative real growth over 1981–83 (although agriculture grew by over 2 percent). Recovery began in 1986 with the implementation of a World Bank–sponsored economic recovery program that

steadily introduced liberalization policies. Over the period 1986–92, both real GDP and agricultural GDP grew by more than 4 percent (World Bank 1994).

Agriculture has remained the dominant production part of the economy, and its share of GDP has actually increased. Agriculture accounted for about 40 percent of GDP in the 1970s and early 1980s, rising to 48 percent in the early 1980s (when the services share fell), before falling back to 45 percent in the early 2000s. The services sector has varied around 45 percent of GDP, whereas manufacturing has declined steadily from 12 percent in the 1970s to just over 7 percent in the early 2000s. The mining share has been less than 2 percent. Within agriculture, the best performance was in food crops, notably pulses, starches, oilseeds, and non-traditional exports (fruit and vegetables) throughout 1976–91, but with good growth in cereals during 1976–85. Traditional export crops performed poorly, with negative growth through 1976–85 and modest growth over 1986–91, reflecting the effect of unfavorable terms of trade on Tanzania: real export prices for coffee, cotton, and tea in 1990 were less than half their value in 1984.

The econometric results in McKay, Morrissey, and Vaillant (1999), based on data up to the early 1990s, suggest that the agricultural sector is quite responsive to relative prices and so can be expected to expand in response to market liberalization. Short-term responses can be expected to be greater for annual crops than for perennials. This kind of supply response has indeed been observed following adjustment policies in Tanzania in the mid-1980s. Liberalization of agricultural markets increased prices paid to farmers and was associated with improved performance following the reforms of the 1980s. Complementary interventions to improve infrastructure, marketing, access to inputs and credit, and improved production technology can be expected to make producers even more responsive.

The role of public investment is especially important if the objective is to expand total agricultural output. Evidence from Tanzania is consistent with the view that much supply response comes from substitution between crops. Total production will respond if incentives are improved, but response is greater if structural constraints are also relaxed. Production data support this argument: although there was a dip in the early 1990s, production of import-competing food crops has grown dramatically in volume terms since the 1970s; production of staple nontradable foods has also grown, but the volume of export crop production declined in the 1980s and recovered only in the late 1990s and 2000s. Considering production shares in total agriculture, however, it is the nontraditional crops that have increased, especially vegetables such as green beans and fruits. Cash crops (for export) have declined as a share of production since 1985, and import-competing products such as maize and rice (and nontraded staples) have maintained their production shares.

The growth of food crop production from the mid-1980s probably contributed to poverty reduction. In 1990, about 85 percent of the Tanzanian population was defined as rural, and agriculture was the primary source of income for the vast majority of these rural people. Almost 60 percent were below the poverty line, some 77 percent of total expenditure was on food, and over 40 percent of total food consumption came from home production (World Bank 1994). Growth in agriculture, especially food production, makes a major contribution to the income and welfare of rural households and hence is central to any poverty reduction strategy.

The growth of agriculture following the economic recovery program was not sustained beyond the early 1990s. In particular, the removal of all subsidies for agriculture in 1994 heralded stagnation if not decline in production, especially as the large increase in fertilizer prices discouraged its use and reduced yields. Production levels of the major crops, maize and paddy, are also very susceptible to fluctuating levels of rainfall and especially drought, which can reduce paddy production by up to half (Isinika, Ashimogo, and Mlangwa 2005).

Skarstein (2005) argues that the reforms led to failure in food crop production during the 1990s, with declines in labor productivity and in maize and wheat yields. The combination of successive devaluations, the removal of the fertilizer subsidy, and privatization of input markets led to a dramatic increase in input prices. Price deregulation in July 1990 was initially associated with significant real producer price increases in the early 1990s (more than doubling for maize, rice, wheat, and millet), but then it induced a decline in real producer prices of maize, rice, and beans (all to less than half their levels of the early 1990s and below the levels of the early 1980s by 1999), wheat (relative to the early 1990s but not the 1980s), and millet in the late 1990s (Skarstein 2005). Although maize and rice production did increase during the 1990s, low real prices and limited marketing opportunities meant that much of the additional production was absorbed as household own-consumption.

Tanzania's strong economic performance over 2000–04, with average annual real GDP growth of almost 6 percent, has been helped by farmers, in particular through an increase in the area under cultivation. Although agriculture had lower growth rates than industry or services, it made a larger contribution to GDP growth than either of the other two sectors (World Bank 2006). There appears to have been a slight reduction in poverty in Tanzania, from an overall headcount of almost 39 percent in 1991 to just over 35 percent in 2000. Although the major reduction was in Dar-es-Salaam (from 28 percent to 18 percent), rural poverty declined slightly, from 41 percent to 39 percent (World Bank 2006). However, sustained growth requires improved manufacturing performance, and to date, Tanzania has not achieved any manufacturing growth.

The structure of exports changed notably in the early 2000s, with a decline in the share of traditional cash crops and an increase in other exports especially from the mining sector. The structure of traditional exports has also changed as coffee and cotton declined, largely because of falling world prices, and there has been a renewal of the cashew nut industry. With the exception of tea, most cash crops experienced a significant fall in export volume over 1994–2003, with a notable dip after 1998 resulting from a decline in international prices, especially for cotton (Kweka 2006). By 2000, the real prices for all major export crops had declined significantly, including the prices of cotton, coffee, and tea, which had declined by some 50 percent since 1994. Although traditional cash crop production has not been a source of increasing (or even stable) farm incomes, there has been a substantial shift toward other products. By 2003, nontraditional exports accounted for almost 80 percent of total exports, of which half was from the mining sector.

A Brief History of Agricultural Policy

After independence, the institutional structure of agriculture was characterized by cooperatives. This mode was not particularly successful, and parastatals dominated marketing starting in the mid-1970s. But these parastatals were not efficient or successful either, and the liberalization policies in agriculture from the mid-1980s have seen a shift back toward cooperatives, with a viable private sector emerging starting in the 1990s.

1960–75: The cooperative system

Following independence, small-holder agriculture was market oriented and supported by an organized system of state-supported cooperatives. The National Agricultural Products Board, established in 1962, held a monopoly over the marketing of grain, purchased from cooperative unions which in turn sourced from the primary cooperatives. The board became the National Milling Corporation (NMC) in 1973, which had the additional responsibility of maintaining the strategic grain reserve (Isinika, Ashimogo, and Mlangwa 2005). Cooperatives were owned and controlled by members on a democratic basis, sales were restricted to the official market, and the marketing board's purchasing price was fixed. The actual producer price was the board's price minus unit marketing costs. Consequently, producer prices varied across the country according to variations in agreed unit costs (an important source of variation was transport costs). Corruption and weak administrative capacity in the cooperative societies and unions were major problems, but the marketing board did help to involve farmers and

limit marketing costs. The system was relatively successful, and through the 1960s Tanzania was self-sufficient in food.

The Arusha Declaration in 1967 heralded the government's "villagization" policy (*ujamaa*), which moved rural populations into new villages with a more socialist-oriented mode of production. The area under cultivation and extension services expanded, and use of chemical fertilizer increased to expand food production. The policy was not successful, and in the early 1970s, a combination of drought and increased prices of imported inputs led to a decline in production (Isinika, Ashimogo, and Mlangwa 2005).

1976–80: The parastatal marketing system

In 1976, the cooperative system based on the membership of individual farmers was abolished and replaced by parastatal crop authorities. Ten parastatal crop authorities were established to cover 27 main and about 15 minor crops. This system was highly centralized, with parastatals responsible for production, research and development, project financing, procurement, processing, and marketing of crops. Each parastatal had a countrywide procurement capability and operated with government-fixed uniform buying and selling prices. A major problem was the lack of effective controls on marketing costs, the burden of which fell primarily on producers of export crops. For food crops, government sought to contain marketing costs in order to maintain relatively low food prices for consumers, and the sector also benefited from input subsidies. For both export and food crops, however, the policy of panterritorial pricing discriminated against producers located close to markets while providing price incentives for remote areas, and thereby expanded total spending on transport and marketing.

Distortions associated with the parastatal system were extensive and costly. Their inefficiencies effectively bankrupted the parastatal organizations, which began to fail in basic functions such as crop collection and payments to farmers. By 1980, the problems had become so alarming that the government decided to reestablish the cooperative movement. This was achieved through the 1982 Cooperative Act, but the new marketing system was hastily formed. For example, every "primary society" was based on only one village, even if that village was too small or too isolated to provide marketing services cost-effectively or was too large for management to be held accountable to its members. In addition, the parastatal companies were converted into marketing boards, limiting their responsibility to processing and final sale but maintaining the marketing chain in the hands of government officials.

Although the parastatal and cooperative marketing system maintained the previously high level of state intervention, significant changes occurred in the 1980s.

For example, export taxes were almost completely eliminated by 1985. In addition, the system allowed for regional price differences through a dual price regime, offering premium prices for regions with high marketed output. This did not take into account differences in transport costs, however, and therefore subsidized regions with high production and high transport costs (such as the Southern Highlands) while taxing regions with low production and low transport cost (such as the Coast). The prices used also had the effect of paying premium prices for less-preferred foods, such as sorghum and cassava from drought-prone areas. These foods were then accumulated in the NMC reserve, leading to heavy financial losses (Isinika, Ashimogo, and Mlangwa 2005).

Price controls imposed high implicit taxation on most producers, encouraging them to switch from cash crops to foods that could be sold at higher prices on parallel markets. The overvalued exchange rate added to these distortions because it “taxed exports and subsidized imports to the extent that it sometimes became cheaper for the NMC to import maize than buy locally” (Isinika, Ashimogo, and Mlangwa 2005, p. 202).

1985–2000: Market transition

The limitations of previous policies led the government to implement reforms towards a more market-oriented, liberalized agricultural sector. In 1984, the government started to decontrol prices, initially for food crops, and to reduce the role of the NMC. By 1990, the marketing of food was largely run by the private sector. Between 1985 and 1992, for example, the share of maize marketed by the private sector in Dar-es-Salaam rose from about 50 percent to 80–90 percent (Isinika, Ashimogo, and Mlangwa 2005, p. 205).

With the growth of private trade in parallel markets, official prices became minimum floor prices. Retail prices were determined by market forces, and actual farmgate prices were those prices minus the farm-to-market marketing and transport costs. Thus, producer prices in the regions with the highest transport costs were closest to the official (minimum) prices (and most likely to become the major sources for government procurement), whereas market prices in other regions were much higher than the official premium price.

As liberalization continued throughout the 1990s, the private sector became more efficient in food marketing. Marketing costs and margins were reduced, private sector trade became more competitive, and grain markets became more spatially integrated, with narrower margins and more effective price transmission. Nevertheless, limited access to information about market opportunities remained a problem for small farmers, and increases in input prices reduced farm profits and discouraged production (Isinika, Ashimogo, and Mlangwa 2005). Concerns

about input costs motivated the government to reintroduce fertilizer subsidies from 2003, albeit on a limited basis. In any case, fertilizer use was not widespread, with no more than 15 percent of farmers using it in the late 1980s; its use was concentrated on maize in the Southern Highlands, coffee in Kilimanjaro, and tobacco in Tabora (Cooksey 2003). During the period of no fertilizer subsidies in the 1990s, maize yields remained stable and production increased in all except drought years.

Liberalization also had significant effects on export crops, especially the two most important: cotton and coffee. In 1994, the monopoly of the Cotton Board was eliminated, cooperatives were allowed to engage in marketing and ginning, and private companies entered the market. By the 1996/97 season, private firms were purchasing about half of production, offering higher prices than the cooperatives. As a result, marketing improved and ginning capacity increased. The producer's share of the cotton export price was about 40 percent during 1989–94 and rose to about 50 percent in 1995–2000 (Baffes 2004). In the late 1990s, taxes on cotton were high, at 13–14 percent of the producer price, but often these were not paid in full (Baffes 2004). And although cotton is very responsive to prices in general, there is no evidence of significant supply response in Tanzania, perhaps because of constraints on the availability of credit and input use, as well as variation in quality. There are some similarities between cotton and cashew nuts, a crop that was also liberalized in the 1990s: although marketing efficiency increased and production grew steadily, limited access to credit to finance purchases of inputs, especially sulfur, was a major constraint, particularly for poorer cashew growers (Poulton 1998).

For coffee, although almost all of Tanzania's production is from small-holders, the Tanzania Coffee Board had a monopoly over marketing, processing, and exporting until the mid-1990s. After 1995, private agents were allowed to enter marketing and processing, although exports were still required to go through the coffee board's auction. According to Temu, Winter-Nelson, and Garcia (2001), by 1997 five fully vertically integrated exporters, all subsidiaries of multinational coffee companies, were engaged in domestic trade in Tanzania. They processed factories and accounted for 45 percent of deliveries to the export auction. Other private buyers accounted for 22 percent of deliveries to auction, and from a zero share before 1994, private agents accounted for almost 70 percent of marketed coffee by fiscal 1997. During this period, marketing margins were reduced dramatically, and the producer price as a share of the export price rose from 50 percent to over 90 percent (Temu, Winter-Nelson, and Garcia 2001). Although there was concern that the five vertically integrated exporters could gain a detrimental dominant position in the market, that had not happened by the late 1990s.

In the early 2000s, some of the gains from liberalization in coffee and other crops were being reversed, in part because the declining world coffee price was

squeezing the margins of traders, and cooperatives were gaining political support in a rearguard action to preserve their position relative to private traders (Cooksey 2003). In 2001, laws were presented to reestablish the Tanzania Coffee Board and Tanzania Tobacco Board, under which producers needed the permission of the boards to grow the crops. Similar measures were proposed for sugar (Cooksey 2003). The 2001 Cotton Industry Act increased the intervention powers of the Cotton Board (Baffes 2004). In sum, while liberalization appeared to have had limited successes for food crops (but see Skarstein 2005), the evidence for traditional exports was mixed, because liberalization policies were either not implemented or not sustained.

Post-2000 policy issues

Recognizing that agriculture accounts for some 50 percent of GDP, 80 percent of rural employment, and over 50 percent of the foreign exchange earnings, Tanzania's Development Vision 2025 places considerable emphasis on the sector. An annual real growth rate of at least 8 percent in agriculture would be needed to provide the basis for economic growth and poverty reduction. A number of policy documents have aimed to achieve this growth: the Agricultural Sector Development Strategy and Agricultural Sector Development Program in 2001, and the Cooperative Development Policy of 2002, complemented by a variety of sector policies, which are fully reviewed in ESRF (2005). We summarize these efforts in terms of three core issues:

First, the policy statements of the early 2000s identified the issues and proposed a strategy. The development strategy statement emphasized the need to improve the efficiency of input markets and product marketing, increase access to credit, enhance the provision of extension services, and increase investment in rural areas (especially for irrigation and transport). The development program was in principle the plan for implementing these aims, but it had limited impact. Thus, the culmination of these initiatives was the formulation of a widespread belief in Tanzania in the need to "reintroduce selective subsidies, particularly for agricultural inputs, machinery and livestock development inputs and services" (ESRF 2005).

Second, the initiatives of the 2000s recognize that, despite the Cooperative Development Policy, the cooperative sector failed to respond to the challenge of liberalization. The sector continued to suffer from weak managerial (and advocacy) skills, a lack of financial resources (in particular undercapitalization of cooperative banks, so credit constraints remained), and a weak institutional structure (especially in the cooperatives' lack of accountability to members). Thus although the cooperative sector remained significant, it was not viewed as

successful, either in supporting development and growth or in representing the interests of members, giving added impetus to reform.

Third, the reform efforts recognize agriculture as integral to the country's poverty reduction strategy, and growth in the agricultural sector is essential if Tanzania is to achieve sustained economic development. While this may seem somewhat obvious, it marks a change in emphasis—the whole sector (not only export crops) has attained a higher status on the political agenda, and a wider range of political actors have expressed the need for positive support to the sector.

Trade policy reforms

Although elements of trade policy reform were introduced as part of adjustment programs beginning in the early 1980s, the major reductions and rationalization of both import duties and domestic sales taxes were announced in 1988 and 1989. The range and levels of tariffs were reduced, and most specific sales taxes were converted to ad valorem taxes. The average effective tariff (defined as tariff revenue relative to value of imports) rose from 2.9 percent in 1986 to 4.5 percent in 1988, which was a period of roughly 100 percent currency devaluation. The average effective tariff then fell slightly to 4.4 percent by 1990, a period of tariff rationalization along with another currency devaluation of about 100 percent (Lyakurwa 1992).

In 1991, the Tax Commission placed a heavy emphasis on further reform of tariffs and sales taxes, recommending that customs duties be simplified to three rates. The 1992 budget actually reduced the number of tariff rates to five. Considerable emphasis was placed on the need to limit the scope of exemptions, because too many importers—in particular government bodies and parastatals—were exempted from tariffs and sales tax. In 1989, actual import tax revenue represented only 44 percent of the yield that would have resulted had no importers been exempt (Tax Commission 1991). Licenses for virtually all imports and exports were abolished in 1993, and by the end of that year, the foreign exchange market was significantly liberalized. The number of tariff rates and the maximum tariff were reduced a number of times; by 1997, there were only four rates, the maximum being 30 percent (with a different and lower schedule of rates applying to members of regional trade agreements). The average tariff fell from about 28 percent in the early 1990s to 16 percent in the early 2000s.

The reforms appear to have had a beneficial effect. The ratio of imports to GDP declined by almost 30 percent (from 37 percent to 26 percent), while the ratio of exports to GDP increased by almost 50 percent (from 14 percent to 18 percent) between the early 1990s and the late 1990s. As of 2005, however,

further harmonization of the tariff structure was still needed, along with improvements to marketing and input supply for agricultural exports. The National Trade Policy of 2003 had sought to address export promotion, but that reform agenda is incomplete and the National Trade Policy was also weak on policies to enhance agriculture. One of its key features was an emphasis on regional integration and commitment to multilateral trade agreements. Agricultural exports featured prominently in the policy, and yet much remains to be done to integrate trade, agriculture, and poverty reduction strategies.

Measuring Distortions to Agricultural Incentives

The main focus of the current study's methodology (see appendix A in this volume and Anderson et al. 2008) is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in nonagricultural sectors for comparative evaluation. More specifically, this study computes a nominal rate of assistance (NRA) for farmers. It also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA).

The quantitative analysis is applied to the most important crops in Tanzania over the period 1976–2004. Almost 80 percent of agricultural crop production is covered. The analysis excludes livestock products, however. Livestock, dairy, and chickens have been important contributors to overall agricultural growth since the mid-1990s, but we did not have adequate data to include them. The 18 products analyzed are classified as cash crops (coffee, cotton, tea, sisal, tobacco, cashew nuts, pyrethrum, and beans); import-competing food crops (maize, rice, wheat, and sugar);¹ and nontraded crops (cassava, sorghum, millet, Irish potato, yam, and plantain).

The basic principle underlying the measures we estimate is that the price received by producers (farmers or processors), adjusted to allow for taxes (subsidies), margins (marketing and transport), and exchange rate distortions, is then compared with some reference price (an undistorted or international price intended to measure the true opportunity cost). In principle, the result is an estimate of the difference between the domestic and competitive world price for a product at a comparable point in the supply chain, with a nonzero wedge implying distortions. For nontraded goods, there is no reference international price, but

the market could be distorted between domestic producers and consumers. We lack information on distortions to input markets and have no evidence to assume any taxes or subsidies to producers of staples (either because there is no tax or the crops are mostly sold by small traders in local markets where sales taxes are not collected), so we assume there are no measurable distortions for the six nontraded staples.

The treatment of exchange rate distortions is similar for all our NRA estimates: because we have no information on the share of currency traded on the black market, we assume the undistorted exchange rate is a simple average of the nominal and parallel market exchange rates. We make a number of other general assumptions. First, we treat cash crops like a semiprocessed traded product, that is, the primary crop is treated as a nontradable, and the analysis is conducted for the processed equivalent (for example, price and production data for coffee are for the clean equivalent that is exported). Second, we assume equiproportionate transmission throughout the value chain. Third, we assume domestic and foreign products are of the same quality. Fourth, we use an international reference price where available, otherwise we use the free-on-board export price.

The measures we estimate do not explicitly account for “excess” international trading costs. Recent analysis (Kweka 2006) suggests that Tanzanian exporters face trading costs above those prevailing in competitive markets, specifically because of inefficiencies in transport and customs (which increase costs, delays, and wastage). We represent these as an implicit tax, because they cannot be passed on to foreign buyers. In the case of import-competing products, we treat the marketable product as the primary product and do not consider the processed product separately, and we use the cost-insurance-freight import price for reference.

Results

The NRA results for the various crops are given in table 11.1. A mixed pattern is evident, reflecting in part the limited quality of the domestic price data available. In effect, each observation is computed at one point in the marketing chain and may not reflect the rates of assistance or taxation that would apply at other locations in the country. Despite the inevitable measurement errors, however, plausible trends of clear importance are visible in the NRA results.

Coffee, traditionally one of the more important crops, faced relatively high negative NRAs from 1976 to the early 1990s. During this period of high state control, producers received about 30 percent of the reference price. After 1995, marketing was liberalized, exchange rate distortions were largely eliminated, and there were no subsidies. Even so, the industry was under severe stress in recent years,

Table 11.1. NRAs for Covered Farm Products, Tanzania, 1976–2004*(percent)*

Product indicator	1976–79	1980–84	1985–89	1990–94	1995–99	2000–04
Exportables ^{a,b}	-77.9	-80.6	-81.6	-65.9	-52.3	-48.7
Beans	-76.7	-76.1	-81.8	-44.5	-47.8	-45.0
Tobacco	-64.4	-65.9	-65.2	-56.5	-37.0	-55.2
Tea	-90.7	-93.9	-93.5	-89.5	-91.0	-90.8
Sisal	-39.1	-40.7	-29.2	-13.1	-0.5	0.0
Pyrethrum	-82.4	-71.4	-73.5	-37.0	-67.8	-47.7
Cotton	-83.1	-87.4	-84.2	-85.4	-72.8	-70.2
Coffee	-69.3	-74.2	-77.4	-44.0	0.0	0.0
Cashew	-66.1	-71.6	-69.1	-39.0	-8.1	-9.6
Import-competing products ^a	-53.1	-55.5	-16.2	10.3	-14.9	5.8
Wheat	-31.5	-54.8	-47.1	44.6	76.4	95.3
Sugar	-8.7	-57.7	-14.7	22.9	39.6	103.1
Rice	-50.7	-63.9	-39.6	2.0	24.8	16.5
Maize	-51.7	-51.7	2.8	13.8	-28.1	-1.1
Nontradables ^a	0.0	0.0	0.0	0.0	0.0	0.0
Yam	0.0	0.0	0.0	0.0	0.0	0.0
Sorghum	0.0	0.0	0.0	0.0	0.0	0.0
Millet	0.0	0.0	0.0	0.0	0.0	0.0
Potato	0.0	0.0	0.0	0.0	0.0	0.0
Plantain	0.0	0.0	0.0	0.0	0.0	0.0
Cassava	0.0	0.0	0.0	0.0	0.0	0.0
Total of covered products ^a	-50.3	-60.3	-51.9	-29.8	-29.1	-16.6
Dispersion of covered products ^b	37.4	39.1	41.3	46.5	47.0	51.9
Percent coverage (at undistorted prices)	83	93	87	81	79	74

Source: Data compiled by the authors.

a. Weighted averages, with weights based on the unassisted value of production.

b. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

with the share of coffee in export earnings falling from 17 percent in 1999 to 4 percent or lower from 2002 (WTO 2007).

Obtaining reliable local price data was a particular problem for cotton, and we experimented with alternative estimates (see Morrissey and Leyaro 2007 for a discussion). The results presented here are based on estimating the producer price (inclusive of all margins) as a ratio of the export price. The NRA was most distorted at -80 percent or more from the mid-1970s to the mid-1990s, but the distortion eased a little, to about -70 percent, starting in the mid-1990s. It seems likely that the extent of disincentive is overestimated. Poulton and Maro (2007) note that significant reforms have been implemented for the cotton sector in Tanzania, especially since 2004, and that the sector now looks quite healthy.

The situation for producers of tea experienced little change over the whole period, with the NRA remaining at about -90 percent. Information on the industry was difficult to obtain, and there are no reports of reforms being implemented, which is consistent with the estimated continuous high taxation of the sector. The estimates could overstate the extent of negative distortions, but it is clear that producers face large disincentives. The tea industry in Tanzania involves strong monopsony power, with a few companies dominating processing and marketing. It is surprising, however, that the significant reduction in exchange rate distortions starting in the mid-1990s did not reduce distortions. The data available to us may not have captured the true situation for the sector. Or, alternatively, producers may have in effect been receiving a diminishing share of the export price, with increased marketing distortions that offset reductions in exchange rate distortions.

Similar conclusions can be drawn for tobacco and pyrethrum. The NRA for tobacco has remained over -60 percent, while for pyrethrum it appears to have fallen from over -70 percent to less than -50 percent. There is no evidence that elimination of the exchange rate distortion has reduced distortions, so one must assume that inefficiencies remain high as farmers receive a diminishing proportion of the export price. Although the results suggest a subsidy for consumers, there are few actual consumers of these products in Tanzania, so the results should be interpreted as implying a potential subsidy for processors and traders (at least in the sense that producer prices are lower than they should be). As with tea, the results may be capturing market distortions rather than actual policy distortions, limiting the ability of government to address the problems.

The results for cashew nuts are consistent with observations that marketing and processing efficiency in the sector has increased in recent years, reflecting the increased competition in the sector. This change has helped farmgate prices keep pace with export prices. An NRA of nearly -70 percent for 1976–89 drew close to zero for the period 1995–2004. Sisal appears to have been the least negatively distorted product, and by the mid-1990s to be freely traded. Beans are the only

example of a nontraditional export covered in our study: the results suggest relatively unchanged marketing efficiency, so the elimination of exchange rate distortions is reflected in a reduction in distortions as the NRA declined from -75 percent -45 percent.

For maize, the sustained negative assistance to producers implies a subsidy to domestic consumers. A combination of trade and exchange rate policies help to explain this implication. Until the mid-1990s, access to the overvalued exchange rate lowered the cost of foreign currency and hence the price of imports, and that lower price was less than offset by the relatively high import tariff (45 percent until 1994). Marketing inefficiencies also kept producer prices (net of margins) relatively low, although the trend in distortions decline from -50 percent to close to zero. This estimate overstates effective rates of assistance to the extent that fertilizer subsidies, accessed by maize farmers during some periods before 1990 and after 2000 are not incorporated in the analysis because of lack of data. Fertilizer accounted for 30 percent of production costs on average, and the subsidy averaged 50 percent of the fertilizer costs for those who received it, so production costs of assisted producers were reduced by 15 percent on average.

The results for rice are somewhat similar to maize, although the timing of turning points differs. Negative assistance to producers declined from -50 percent to close to zero by the 1990s and became even slightly positive in the early 2000s. Producers were able to avail themselves of fertilizer subsidies after about 2000 (as they were before 1990). As with maize, the combination of trade and exchange rate policies help to explain the trend.

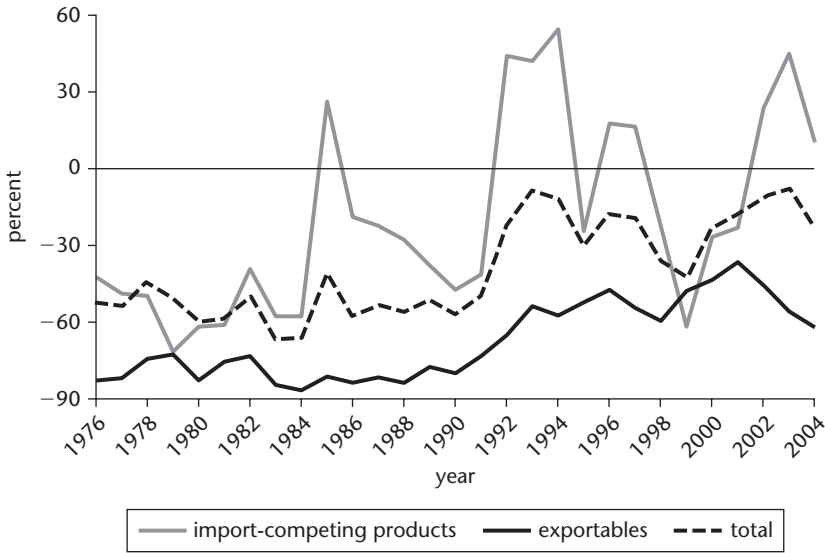
The results for sugar are harder to interpret, and data limitations are severe (in particular in distinguishing stages of production). The industry appears to be highly protected in Tanzania, as sugar typically is in other countries. A larger proportion of the producer subsidy may be retained by the processor at the expense of the cane farmer than our NRAs suggest, however.

The aggregate NRAs for exportable, import-competing, and all covered farm products are summarized in figure 11.1. A clear antitrade bias is evident from that figure, although it was smaller in 2000–04 than it was in the 1980s before the reforms began.

The aggregate NRA for covered products is repeated at the top of table 11.2. Also reported there is a guesstimate of the NRA for noncovered products, which account for 20–25 percent of production. Those goods (largely nontraded fruits, vegetables, and livestock products) are assumed to face distortions only from the market for foreign currency.

Aggregate distortions to agriculture appear to have been reduced quite significantly, from worse than -50 percent in the early 1980s to -25 percent in the 1990s and to just -12 percent in the early 2000s.

Figure 11.1. NRAs for Exportable, Import-Competing, and All Farm Products, Tanzania, 1976–2004



Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

How does this compare with the NRA for producers of nonagricultural tradables? The RRA estimates comparing agricultural and nonagricultural policies are shown in the middle rows of table 11.2. The RRA measures the overall bias against farm production, relative to nonagricultural tradables. The bias has halved since the latter 1980s, from -70 percent to -35 percent in the early 2000s. The overall bias against agriculture has been reduced but remains considerable. This change is also depicted in figure 11.2.

The final set of rows in table 11.2 shows what the distortion indicators would have been had the distortions to exchange rates not been taken into account. They suggest that more than one-quarter of the RRA in the 1980s was attributable solely to exchange rate distortions but that they have since disappeared.

Prospects and Implications

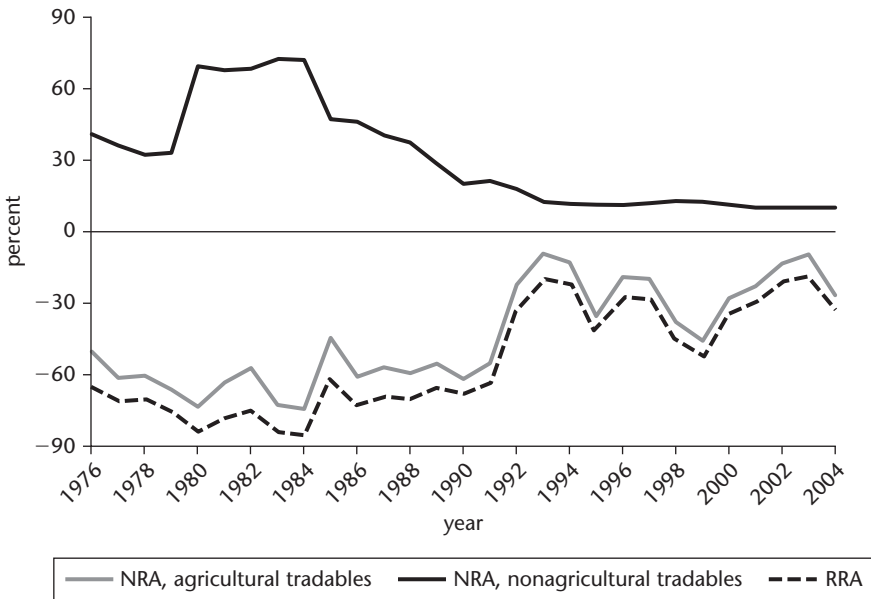
It is important to emphasize that the estimates reported here are based on many assumptions and limited data that in at least some cases were not really up to the task. For cash crops, it was difficult if not impossible to distinguish the effect of

Table 11.2. NRAs for Agriculture Relative to Nonagricultural Industries, Tanzania, 1976–2004
(percent)

Indicator	1976–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRA, covered products	-50.3	-60.3	-51.9	-29.8	-29.1	-16.6
NRA, noncovered products	-1.2	-3.1	-2.1	-0.3	0.0	0.0
NRA, all agricultural products ^a	-41.8	-56.3	-45.3	-25.2	-23.2	-12.4
Trade bias index ^b	-0.43	-0.55	-0.71	-0.58	-0.29	-0.35
NRA, all agricultural tradables	-59.6	-68.2	-55.4	-32.3	-31.7	-20.1
NRA, all nonagricultural tradables	35.5	69.9	39.8	16.6	11.9	10.3
RRA ^c	-70.3	-81.3	-68.1	-41.3	-38.9	-27.6
Memo item, ignoring exchange rate distortions:						
NRA, all agricultural products	-33.0	-39.8	-29.1	-20.8	-22.3	-12.3
Trade bias index ^b	-0.02	0.42	-0.35	-0.45	-0.24	-0.35
RRA ^c	-58.5	-66.1	-47.9	-34.0	-36.9	-27.3

Source: Data compiled the authors.

- a. NRAs including product-specific input subsidies and non-product-specific (NPS) assistance. NRA is the total of assistance to primary factors and intermediate inputs divided by total value of primary agriculture production at undistorted prices (percent).
- b. Trade bias index is $TBI = (1 + NRA_{ag,i}/100) / (1 + NRA_{ag,m}/100) - 1$, where $NRA_{ag,m}$ and $NRA_{ag,x}$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.
- c. The RRA is defined as $100 * [(100 + NRA_{ag}^t) / (100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 11.2. NRAs for All Agricultural and Nonagricultural Tradables and the RRA, Tanzania, 1976–2004

Source: Data compiled by the authors.

Note: For definition of the RRA, see table 11.2, note c.

policy distortions from inefficiencies in marketing and market structures.² This is particularly important for estimates since the mid-1990s when policy distortions relating to the exchange rate and export taxes were eliminated.³ It is quite possible that for cash crops such as tea, cotton, beans, and tobacco, the negative estimates reflect market inefficiencies in addition to (and perhaps even more than) policy distortions. Nonetheless, we believe the relative estimates are reasonably reliable for later decades, though probably less so for the 1970s. Our results point clearly to the conclusion that, among the cash crops, products with high NRA estimates are those with limited competition and inefficient marketing or processing (cotton, tea, and tobacco), whereas NRAs are small for products where competition has been introduced and efficiency increased (coffee, cashew nuts, and sisal).

The agricultural sector performed reasonably well starting in the mid-1990s, and especially in the early 2000s. By 2005, the policy emphasis was on ensuring that the poor shared in growth. For agriculture, this implied a need to focus on improved functioning of output and input markets (especially credit) and on

public spending on agricultural sector development, especially irrigation and strengthening research and extension (World Bank 2006). Our results, showing continuing and widespread distortions that are mostly negative, reinforce the need for this focus.

Overall, the study leads to two specific conclusions and one general implication. First, although liberalization of the exchange rate reduced the black market premium in the 1990s and removed it by about 2000, exchange rate reforms did not translate fully into a reduction in distortions to producers in all crops. Benefits in terms of less negative NRA measures can be seen for coffee, cashew nuts, cotton, and beans among major exports and for food crops, but many export crops (such as tea and tobacco) appeared unaffected. This finding implies that for many cash crops, other distortions, stemming from high transport costs, marketing inefficiencies, and the prices paid to farmers, grew worse. Addressing these distortions will require institutional changes.

Second, there is little evidence of improvements in marketing, processing, and transport efficiency for most products. This conclusion may simply reflect limitations in the data available, but we do find evidence that high transport costs were still a major distortion for export crops in the 2000s. For food crops such as beans and maize, where distortions were reduced progressively but remained high, the lessening of distortion can be fully attributed to exchange rate liberalization. For crops such as tea and tobacco, where producer distortions did not decline despite exchange rate liberalization, other distortions must have risen to offset that change, suggesting that commodity boards were still not functioning in the interest of farmers.

The general implication is that policy reforms in agriculture have some way to go to eliminate distortions, but certain products may provide examples of what to do: for example, coffee and cashews for exports, and rice for import-competing food. Overall, the negative distortions to agriculture have been reduced, but they still remain high for a number of crops and have not fallen sufficiently relative to the rest of the economy. Given that agriculture is such a large share of the economy, sector growth is essential to achieving sustained economic growth in Tanzania. Measures to improve crop yields and production efficiency are important, but the analysis presented here suggests that measures to improve competitiveness and efficiency in processing, transport, and distribution remain highly desirable.

Growth in agriculture can contribute significantly to poverty reduction: the rural poor as producers benefit, and provided productivity and efficiency increase so that real prices can be reduced, the poor as consumers of food can also benefit. In this respect, measures relating to regional cross-border trade, typically omitted from official statistics and often from policy discussions, have a potentially high payoff. Intra-regional trade facilitation and other measures associated with

regional integration could make cross-border trade easier, benefiting those in border areas. The typical focus of analysis of marketing and transport costs is on getting products to Dar-es-Salaam, either as the major domestic market or as the main port for export. While some attention to Dar-es-Salaam is appropriate, it should not be at the expense of local, and especially border, markets.

Notes

1. There were often exports of maize and sugar, sometimes even net exports, but they are treated as import-competing products because imports tend to be significant and producers do compete with imports. In the case of maize, informal cross-border exports, especially to Kenya, are often significant but are not included in official trade statistics. This observation highlights the fact that our estimates relate to the aggregate national sector, whereas specific regions and farmers tend to face regional price, marketing, and trading variations that imply a different level of distortion compared with the national average. This concern applies to all food crops and, to a lesser extent, cash crops (margins and marketing costs may vary by region but prices should be fairly uniform). Unofficial cross-border trade may be important for many horticultural products omitted from the analysis, and in some cases for crops that we define as nontraded.

2. Four “levels” of agricultural market can be identified in Tanzania (Eskola 2005). Local (village) markets are where farmers sell surplus production, typically of (noncereal) staples; these markets are seasonal and not integrated into regional markets. Regional markets are typically based in district capitals or urban centers and sell a wide variety of food products. Although some farmers may trade, the markets are dominated by traders who collect products from producers and other markets (and larger-scale traders may supply the national market). The national market is essentially Dar-es-Salaam, the marketing hub of the country (given the nature of transport systems, regional markets are usually linked through this city) and the largest urban market. It is dominated by relatively large-scale traders. Finally, cash crops serve the export market, and most cash crop production is exported (in largely unprocessed form); these exports are dominated by large-scale, often foreign, traders.

3. Policy distortions have not been entirely eliminated because commodity boards were established for the cash crops (except beans) and sugar after liberalization to replace the monopoly marketing boards. These commodity boards announce minimum prices to be paid to farmers and impose a 2 percent levy on exports. There are also a variety of other taxes or levies (imposed at various points on the production chain), some of which vary across districts (WTO 2007).

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UGANDA

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Uganda, a society of diverse ethnicity and religion, secured its independence in 1962. Since then, its history has been characterized by long periods of violence and political instability that culminated in military takeovers in 1971, 1979, 1985, and 1986. Since 1986, when President Yoweri Museveni's National Resistance Movement came to power, most parts of the country have experienced relative peace. In the north and northeast, however, rebels fought a civil war for over two decades until a ceasefire was declared in August 2006, although final peace negotiations had not yet been concluded as of mid-2008.

Uganda remains one of the poorest countries in Africa. Its gross domestic product (GDP) per capita averaged \$235 in 2000–04, compared with the Sub-Saharan Africa average of \$585—despite a remarkable growth rate in annual GDP per capita of 5.9 percent in the period 1980–2004.¹ Uganda's population increased from 7.1 million in 1960–64 to about 26.0 million in 2000–04. Annual population growth averaged 3.4 percent from 1980 to 2004, one of the highest growth rates in Africa and the world.

High transportation costs limit the landlocked country's participation in international trade. Exports of goods and services amounted to 7 percent of GDP in 1985–89, increasing to 13 percent in 2000–04. The share of imports in GDP increased from just 14 percent to 32 percent over the same period. The gap is met through aid inflows, which rose from 5.9 percent of GDP to 13.8 percent of GDP. In part because of the prolonged disorder and civil strife, agriculture is the most important sector in the country's economy and remains more

* The authors are grateful for helpful comments from workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Matthews, Claquin, and Opolot (2007).

important than in comparable countries in Sub-Saharan Africa. The performance of agriculture, and especially coffee, has been the driving force for the economy as a whole.

Uganda's early postindependence economic policy followed a rather conventional development strategy, emphasizing private sector participation with mild import substitution. This model was soon abandoned in favor of public sector dominance, however, and as elsewhere in Africa, the state-led model of economic development quickly ran into trouble. In Uganda, its demise was accelerated by a particularly chaotic period of economic policy making in the 1970s following Idi Amin's seizure of power in 1971. During this period, which devastated the economy, the Asian business community was expelled and business management was put in the hands of inexperienced Africans on the pretext of Africanizing the economy. There was a huge expansion of the public sector and in the number of parastatal enterprises, which quickly became a drain on public resources.

Amin fell in 1979, and an economic reform program was initiated in 1981 with support from the International Monetary Fund (IMF) and the World Bank. However, economic policy continued to follow a zigzag course until an economic recovery program, again supported by the IMF and the World Bank, was launched in 1987. Since then, Uganda has experienced sustained growth, with the annual real GDP growth rate averaging 6.2 percent. This growth has been accompanied by a dramatic drop in the proportion of the population experiencing income poverty, which fell from 56 percent in 1992 to about 38 percent in 2002.

This study investigates the impact of various policy regimes on the agricultural sector, which is critically important as a vehicle for income growth and poverty reduction. Direct and indirect policy-induced distortions are computed based on a database of agricultural production, prices, policies, and margins for the period 1961–2004. The study finds a clear relationship between agricultural incentives and the different periods of economic policy. Agriculture was lightly taxed in the 1960s, but the burden of taxation increased significantly during the chaotic years of the 1970s and 1980s. Since the onset of agricultural liberalization at the beginning of the 1990s, the discrimination against agricultural production has been greatly reduced. The main challenge now facing the Ugandan government is to improve the competitiveness of agriculture through a supply-side investment strategy as the key element in its poverty reduction strategy.

This chapter turns now to a discussion of the growth performance and structural changes in the economy, followed by a review of the evolution of policies over time. Then distortion indicators are presented, and finally the findings are summarized and future prospects reviewed.

Growth and Structural Changes in the Economy

Uganda's growth performance until 2004 can be divided into four phases: the prelude to independence and the immediate postindependence era (1961–70); the period of economic collapse during the Amin era (1971–80); the period of intermittent growth episodes (1981–86); and the period of sustained growth and recovery (1987–2004).² A brief discussion of each of these periods is followed by a survey of structural change and of agriculture's performance.

Growth performance

At independence, Uganda was well positioned to embark on a successful development path. Agriculture was an important foreign exchange earner through the export of coffee, cotton, and tea while at the same time providing basic self-sufficiency in food. The manufacturing sector produced inputs for the agricultural sector and consumer goods and was becoming a significant source of foreign exchange through the export of textiles. The country's current account balance was in surplus and domestic savings averaged 13 percent of GDP. A good transportation system was in place, in part facilitated by cooperation in the East African Community; the system included a road network, railways, and port and air services.

Immediately after independence, the economy experienced an initial period of significant progress. Real per capita GDP grew at an average rate of 2.9 percent, despite the high population growth rate. However, economic progress started to decline in the late 1960s as a result of growing political turmoil, which culminated in a coup d'état led by Idi Amin, who deposed Milton Obote in 1971.

This initial economic progress was ruined by the political turmoil and economic mismanagement of the 1970s. A series of negative external shocks during the mid-1970s also contributed to the collapse economy, including higher oil prices and the breakup of the East African Community, which disrupted international traffic movements. Increased military and other expenditures led to large fiscal deficits, which were financed by domestic borrowing, with inflation as a predictable outcome. Consequently, real GDP fell 25 percent during the Amin period, with particularly sharp falls recorded in the value added of the industrial and monetary agricultural sectors. The only sector that recorded steady growth was the subsistence sector, which provided individual food security and supplied the thriving and lucrative parallel markets.

The Amin government was overthrown in April 1979 by a combined force of the Tanzanian army and a Ugandan rebel group, the United National Liberation Front. In December 1980, Milton Obote assumed power for the second time, with

the economy in deep crisis and infrastructure in complete ruins. The first attempt to revive the economy was made in 1981, when the government implemented the Stabilization and Structural Adjustment Program, with financial and technical assistance from the IMF and World Bank. The program collapsed after barely four years, following the government's failure to comply with program benchmarks. The economic crisis, together with growing political opposition, led to the removal of the second Obote government in a military coup in 1985. The military coup led to further repression and economic chaos. After a further six months of civil war, Museveni's National Resistance Movement (NRM) took power in 1986.

Between 1981 and 1986, the annual GDP growth rate averaged 2.2 percent, while the annual average for growth in the agricultural sector was 2.5 percent. This modest average performance stemmed largely from the recovery in the first half of this period. Then, after an initial period of indecisiveness, the NRM government agreed to a new policy package with the IMF and World Bank in May 1987, formalized in an economic recovery program. The program aimed to restore fiscal discipline and monetary stability and to rehabilitate the economic, social, and institutional infrastructure. Since then, significant unilateral agricultural, trade, and exchange rate reforms have been undertaken aimed, in part, at removing policy-induced distortions in the agricultural sector. Following these reforms, real annual GDP growth averaged 6.2 percent, well above the average annual growth rate of 2.2 percent during the early 1980s and the average annual decline of -1.6 percent during the 1970s. Annual agricultural growth averaged 3.7 percent between 1987 and 2004, although it declined in 2004 largely on account of drought. An important question is how much of this buoyant growth represents a "bounce-back" from the devastation of the previous two decades as a result of improved security and whether it can be sustained (IMF 2005).

Structural changes in the economy

The British colonial policy turned Uganda into a reservoir of cheap raw materials for British industry and a market for its finished goods. There was very limited effort to develop the manufacturing sector, save for the setting up of cotton ginneries and coffee processing plants and the provision of transport infrastructure to reduce transport costs while at the same time protecting the quality of the raw materials. Consequently, the structural composition of economic activity was skewed in favor of agriculture, and this dependence on agriculture has continued to a rather remarkable extent. In the late 1960s, 92 percent of the labor force depended on agriculture, and the sector contributed 46 percent of GDP and 97 percent of exports. In 1990, agriculture accounted for around 50 percent of GDP, 85 percent of employment, 99 percent of export earnings, and 40 percent of

government revenue. Even in 2000–04, agriculture accounted for 31 percent of GDP, was the primary source of income for 80 percent of the population, and contributed 81 percent of exports (Sandri, Valenzuela, and Anderson 2006). The share of the secondary sector, which includes manufacturing, electricity generation, and construction, has increased only modestly, and the share of the service sector has increased by about 10 percentage points since 1961.

Characteristics and performance of the agricultural sector

Uganda has a variety of agroclimatic conditions across its regions. Five distinct farming systems or areas can be defined by the rainfall pattern and soil characteristics. These include the high rainfall area around Lake Victoria where bananas, robusta coffee, and other food crops are grown; eastern Uganda, with two distinct rainy seasons separated by a four-month dry period, where the main crops include millet, cassava, groundnuts, maize, and cotton; the northern region, where the rainfall pattern restricts cultivation to one season, with the main crops being cotton, maize, and millet; the mountainous areas, where the altitude permits the cultivation of temperate fruits, vegetables, and some traditional food crops; and northeastern Uganda, where the annual rainfall of 80 millimeters is suitable for pastoralism and the cultivation of sorghum and millet (World Bank 1993). The country's natural environment provides good grazing for cattle, sheep, and goats, with indigenous breeds dominating the livestock industry. The most important cash crops are coffee, tobacco, cotton, and tea. Coffee has been the main foreign exchange earner since colonial times. Its share in total agricultural exports was about 50 percent in the 1960s, grew to more than 80 percent in the early 1980s, but then to about 20 percent in the early 2000s. Maize and beans have become important nontraditional exports, especially in regional trade.

The number of people dependent on agriculture increased from 3.7 million in 1960–64 to 9.4 million in 2000–04. During the same period, the agricultural land area increased from 9 million hectares to only 12 million. As a result, agricultural land per agricultural worker nearly halved, falling to 1.3 hectares over this period. Ugandan agriculture is largely dependent on small-holder production, where production for household consumption constitutes a significant proportion of the consumption basket. In 2001/02 the subsistence sector accounted for 44 percent of total agricultural output, compared with 52 percent in 1991/92. Large-scale estates are only significant in the tea and sugar subsectors.

The typical diet varies from region to region, a result of differences in staple crops, of which the most important are plantains (*matooke*), yam, cassava, maize, millet, and sorghum. Food production has not kept pace with population growth. Based on statistics from the Food and Agriculture Organization, mean daily

dietary intake deteriorated between 1992/93 and 1999/2000, from 1,890 calories to 1,640 calories. The proportion of the population receiving less than 60 percent of required calories rose from 32 percent to 44 percent over the same period (Opolot, Wandera, and Atiku 2005).³

The annual growth rate of Uganda's agricultural GDP averaged 3.4 percent between 1980–2004, only slightly above the average of 3.2 percent for Africa as a whole during the same period (Sandri, Valenzuela, and Anderson 2006). The production of cotton, tea, and tobacco virtually collapsed during the late 1970s and early 1980s. Since the late 1980s, the government's export strategy has concentrated on reviving traditional exports as well as encouraging diversification in commercial agriculture that would lead to a variety of nontraditional exports.

Evolution of Policy

The colonial administration created a highly open economy. By 1960, the economy was heavily dependent on import-export trade characterized by the supply of raw materials for export and the import of consumer goods for the domestic market. The policy framework in the immediate postindependence period (1962–66), which was built on the recommendations of a World Bank mission, did not deviate much from the policy framework inherited from the colonial administration. It emphasized the promotion of commodity exports, external financing to bridge the savings-investment gap, and the promotion of private investment by encouraging existing investors and creating incentives to attract new ones, including African entrepreneurs. As discussed earlier, commendable economic progress was recorded during this period.

The second development plan, which came into force in 1967, instituted radical changes aimed at promoting the dominance of the public sector in the economy. The policy emphasis shifted to import-substituting industrialization, and import tariffs and customs refunds on imported raw materials were introduced, although the level of protection remained modest (Bigsten 2000). In the same vein, the government made pronouncements (commonly referred to as the Nakivubo Pronouncements) directed at socializing the means of production in 1969. Consequently, the government acquired 60 percent of ownership in most if not all private sector ventures. In addition, the export marketing of all cash crops was nationalized through the formation of statutory marketing boards. At the local level, the processing factories (cotton ginneries and coffee factories) originally owned and run by non-Africans were handed over to the cooperative movement managed mainly by Africans. Export taxes, price controls by state marketing boards, exchange controls, subsidies provision, and administered credit to the agricultural sector were the order of the day.

Amin took power in early 1971 and in 1972 declared an “economic war,” during which 50,000 Asians were expelled and their productive and personal assets confiscated. This huge loss in skilled personnel affected both agricultural and industrial production. Further damage was caused by economic mismanagement and a substantial expansion of the public sector, which quickly became a drain on public resources. The agricultural sector suffered from poor service delivery, shortage of agricultural inputs, market deterioration, and delayed payments to farmers. Corruption and the bureaucratic tendencies of marketing boards contributed to high costs. As a result, marketing boards absorbed a larger percentage of the world market prices, leaving producers with low producer prices. This was exacerbated by the practice of late payment, which acted as a further tax on farmers’ incomes.

The rehabilitation of the economy was the first task facing the post-Amin governments along with the creation of political stability. The first attempt at policy reform was in 1981 with the support of the IMF and the World Bank. The policy reforms included, among other things, the floating of the shilling, an increase in producer prices for export crops, removal of price controls, and rationalization of the tax structure and government expenditure.

This reform program collapsed in 1984 after the IMF and World Bank cut off lending, following the government’s failure to meet the program benchmarks. In 1984 alone, public sector wages increased fourfold, bank credit to government increased by 70 percent, and the money supply increased by 127 percent. Further, foreign exchange controls were tightened in the face of insufficient foreign exchange inflows. The return to economic crisis was both prompted by and a factor in the renewed civil war following which the National Resistance Movement came to power in 1986.

The new government first reintroduced controls, revalued the currency, and sought to support the import-substituting sector. The consequences of this policy stance were economically devastating. The budget remained in serious deficit, export duties eroded, producer prices and export revenue fell in real terms, the balance of payments worsened, reserves were depleted, and arrears accumulated. Underground market activities flourished, inflation rose to over 200 percent between 1985 and 1987, and the parallel exchange rate rocketed to several times the official rate (Loxley 1989).⁴

In early 1987, the NRM government turned to the IMF and the World Bank for financial assistance. This led to a more consistent and successful phase of policy reforms launched in May 1987. The reforms embraced monetary and credit policy, fiscal policy, exchange rate policy, and trade policy as well as institutional, pricing, and domestic market reforms in the agricultural sector (for details, see the appendix in Matthews, Claquin, and Opolot 2007). In 1997 the national vision

and strategies for the reduction of poverty were articulated in the Poverty Eradication Action Plan, which was further revised in 2000 and 2003. Its overarching objective is to reduce absolute poverty to less than 10 percent by 2017.

Measurement of Agricultural Policy Distortions

The main focus of the current study's methodology (see appendix A in this volume and Anderson et al. 2008) is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market), but it also generates estimates of distortions in nonagricultural sectors for comparative evaluation.

More specifically, this study computes a nominal rate of assistance (NRA) for farmers. It also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA). Although distortions undoubtedly existed in farm input markets in Uganda during the period analyzed, purchased farm inputs are so little used in Uganda (with the possible exception of cotton) that we have ignored their impact.

In our analysis, we have assumed that the farmgate price equals the wholesale (market) price for primary products, in the absence of detailed information on the average farm-to-market margin. More problematic is an assumption about the proportion of the protection or taxation of the processor (as measured by the processor's NRA) that is passed back to the primary good wholesaler. For much of the period before liberalization, government marketing policy set both the wholesale price for the processed product and the market (wholesale) price for the primary product. To the extent that these announced prices were effective (which was more often the case for export crops than for food crops), processors were constrained in the extent to which they could pass back the (mostly negative) effects of government interventions to farmers. The pass-through of distortions from processors to wholesalers was effectively determined by the margin allowed by government policy.

Various assumptions about government price-setting behavior are possible for the period before liberalization. For example, if the government set the producer price in relation to the processed good wholesale price by allowing for a competitive (undistorted) margin, then the pass-through value should be calculated on the basis of the inverse of the input-output coefficient between the primary good

and the processed one at the wholesale level. It turns out that the absolute margin varies considerably from year to year, making this hypothesis unlikely. We have thus assumed equiproportionate pass-through of the processed product distortion. In other words, for the preliberalization period we have assumed that, in setting prices and the processing margin, the government distributed the incidence of its interventions proportionately along the marketing chain.

Product coverage

The commodities covered in our study are coffee, cotton, tea, rice, maize, sugar, beans, cassava, groundnuts, plantains, cassava, yam, millet, and sorghum. These commodities account for between 75 and 85 percent of the (nondistorted) value of output. The trade status of each commodity depends on its net trade position in volume terms, as determined using FAOSTAT data.⁵ A commodity was assumed to be nontraded in any year if either the percentage share of exports or imports in production was less than 2.5 percent. The reason for nontraded status needs to be assessed in the calculation of distortions. Where an (otherwise import-competing) product is not traded because of high trade taxes or nontariff barriers, the analysis takes that into account. We find that most of the staple foods were nontraded throughout the period. It is reasonable to assume that the lack of trade results from trade cost rather than from trade policy reasons. Maize and beans were nontraded in the early part of the period but were increasingly traded in the latter part of the period.

Marketing costs of the state marketing boards

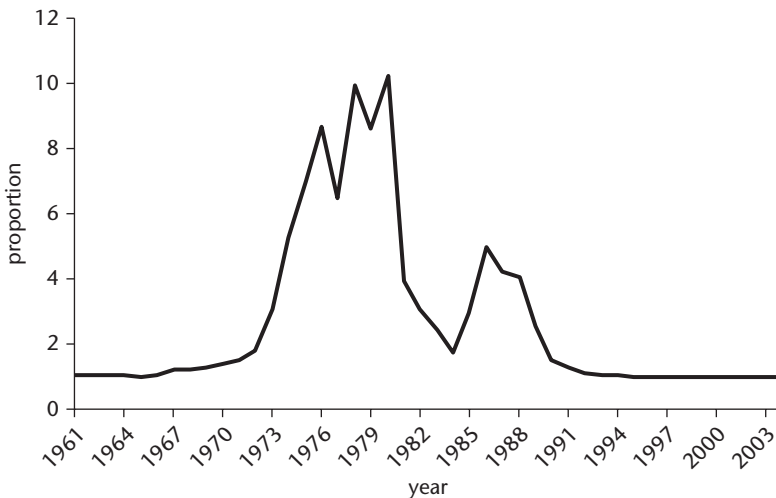
Parastatal marketing boards dominated agricultural marketing in Uganda from independence until the early 1990s. These boards had the sole right to export coffee, cotton, and tea, and they regulated internal marketing as well. Thus, coffee growers could sell only at licensed markets or to licensed traders at a fixed minimum price, and the processing margin was also fixed by the marketing board. Similarly, in the case of cotton, growers had to sell to ginneries in a particular zone at a predetermined price, and the margins allowed for ginneries were fixed by the Lint Marketing Board. To the extent that the margins of the boards themselves or the margins determined for processors were higher than what would have been expected in an unregulated situation, then the extensive government regulation of agricultural marketing counts as an additional distortion that should be included in the NRA of these commodities. The parastatal marketing boards also undermined the efficiency of the marketing system. Payments to cooperative unions and thus to farmers were often delayed, resulting in a real reduction in the prices

received, particularly when inflation was high. Stock levels were often unnecessarily high, and crop finance was inadequate. Delays in collection and transport caused qualitative losses, for example, in coffee. Although the likelihood of inefficiencies can be documented, trying to quantify their magnitude is more difficult. One approach is to compare the marketing margins after liberalization with those before liberalization, on the assumption that greater competition after liberalization would lead to increased efficiency and drive margins closer to opportunity costs. We report on the results of this comparison when discussing the NRAs for coffee and cotton.

Treatment of foreign exchange distortions

For most of the period, Uganda had a parallel exchange rate, which often was a large multiple of the official rate (figure 12.1). The premium increased rapidly in the 1970s, when the parallel rate grew to 10 times the official rate, and grew again in the mid-1980s as detailed in the appendix to Matthews, Claquin, and Opolot (2007). We assume that all agricultural exports were converted at the official exchange rate until liberalization began in 1991 and that food imports were purchased at the parallel market rate. This assumption may exaggerate the bias against agricultural exports in some years, because some agricultural exporters

Figure 12.1. Parallel Market Exchange Rate Premium over the Official Exchange Rate, Uganda, 1961–2004



Source: Data compiled the authors.

may have had access to foreign exchange at official rates.⁶ This overvaluation of the exchange rate was by far the most important policy distortion affecting agricultural incentives over the period. The size of this distortion can be measured relative to an estimated equilibrium exchange rate. The estimated division of the total foreign exchange distortion between an implicit export tax and an implicit import tax depends on the estimated elasticities of supply of exports and of demand for exports (Anderson et al. 2008). In the absence of more specific information, we assume that these elasticities are equal and estimated the equilibrium exchange rate to be the mean of the official and parallel market rates.

Treatment of input distortions

In calculating the overall NRA for an agricultural product, distortions in relevant input markets should also be taken into account. Government agencies had a virtual monopoly on the marketing of agricultural inputs in Uganda. They provided different levels of price subsidies for inputs based on the exchange rate margins between the official and parallel market rates. In the early 1990s the government withdrew entirely from the marketing of agricultural inputs. Liberalization was followed by the government's removal of tariffs on imports of these inputs. The availability of inputs, including agrochemicals, farm tools, and implements, is now much improved compared with the situation before liberalization. However, the market for agricultural inputs remains very small and these input market distortions have not been taken into account in the computations.⁷

Subsidized credit was an important instrument of development policy. The Uganda Development Bank and several other institutions supplied credit to local farmers, although small farmers also received credit directly from the government through agricultural cooperatives. However, for most small farmers, the main source of any short-term credit was the policy of allowing farmers to delay payments for seeds and other agricultural inputs provided by cooperatives. While government-imposed fixed lending rates and poor recovery rates implied that those farmers fortunate enough to secure a loan received an implicit subsidy, the sharp curtailment of lending as a result of these financial losses implied that the agricultural sector as a whole was disadvantaged. In addition, donor funds were made available (often at negative interest rates) for the rehabilitation of the agroprocessing sector during the 1980s. In the absence of data, we have not been able to incorporate these credit subsidies into our analysis, but in quantitative terms they are not likely to have been significant.

Other interventions, such as high fuel taxes and duties on imported vehicles, adversely affect the cost of agricultural marketing. But these policies do not discriminate specifically against agriculture so they are not counted as distortions in

this analysis. A specific distortion in the preliberalization period was the monopoly held by the Uganda Railways Corporation on the transport of coffee to Mombasa. The state-run railway system was very inefficient, as shown by the very long turnaround times both in Kampala and Mombasa. Transportation of coffee to ports for export was liberalized in 1992. Competition among freight and shipping companies reduced the cost of moving commodities from Uganda to Mombasa by over 40 percent in the five years between 1997 and 2002 (NRI/IITA 2002).⁸ This sharp fall in the cost of shipping exports to Mombasa means that the Uganda free-on-board (fob) prices relative to the international price should have increased. Because we have used fob prices as the relevant international prices for our analysis, we do not capture this distortion and its subsequent removal in our analysis.

Trends in Agricultural Distortions in Uganda

We begin with estimates of distortions in the two most important traditional export products, coffee and cotton, before discussing distortion estimates for the rest of the farm sector and for nonagricultural tradables.

Coffee

Robusta coffee has been Uganda's traditional coffee export; however, arabica production has increased over time and in the early 2000s accounted for around 15 percent of production. Given its importance in the Ugandan economy, the industry has been under tight government control since the colonial era. A Coffee Industry Board was established in 1953 to administer the price-fixing provisions previously covered by the defense regulations. Uganda joined the International Coffee Organization which came into being in 1962, and had to conform to the export quota allocated by that organization. To manage this export quota, a Coffee Marketing Board was established by the 1962 Coffee Act and given a monopoly over robusta marketing and export. This monopoly was extended to all coffee in 1969.

The preliberalization system was based on fixed producer prices and processing margins, with small-holders delivering coffee to primary cooperatives or private traders. The coffee was then transported to either cooperative unions or private traders for hulling. The processors had to pay a minimum price to growers, although this price could be discounted at markets to account for the transport cost to the factory. The hulled coffee was then sold, at prices fixed by the government, to the marketing board, which in turn sold to exporters overseas (NRI/IITA 2002). With all margins fixed by the government, the difference between export receipts and the government-set price of exports in local currency remained with the government. The marginal tax rate was 100 percent (World

Bank 1993). Marketing-chain costs and margins after liberalization are described in NRI/IITA (2002).

With the adoption of the economic reform program in 1987, a series of institutional and marketing reforms was implemented in the coffee sector. In 1990, the marketing board's export monopoly was removed, giving cooperative unions and private exporters access to the export market. To separate regulatory and trading functions, two new institutions were created within the marketing board: the Uganda Coffee Development Authority (UCDA) took on regulatory authority, and Coffee Marketing Board Limited took on the trading functions. In July 1991, controls on prices and margins were removed; however, the administered prices were replaced by indicative prices announced by the UCDA, and a floor price was announced daily for exports. Competition in the industry was further enhanced in November 1991, when government guarantees for crop financing were withdrawn, effectively making life more difficult for the cooperatives who had been the beneficiaries of the guarantees. In March 1992, exporters were permitted to exchange coffee proceeds at the open-market rate and in July 1992 the export tax on coffee was removed, although it was briefly reimposed in the wake of the coffee boom in 1994. Currently, there are no restrictions on coffee trading or processing of coffee, although since 1995 the UCDA has levied a cess (currently 1 percent) to finance its activities of quality control and promotion and monitoring of coffee marketing.

International prices for coffee (a weighted average, using Ugandan production weights, of robusta and arabica world prices) in 2004 were close to those in 1961 in nominal U.S. dollar terms, but in the intervening years the coffee market experienced three price spikes: in 1977, 1987, and 1995. The Uganda fob (US\$) price closely follows the international price, though at some discount that probably reflects the transport cost of shipping coffee from Kampala to Mombasa and onward to international markets. The fob price in local currency expressed in constant prices bore little relationship to the fob price in U.S. dollars between the early 1970s and the mid-1980s, largely because of the increasing misalignment of Uganda's exchange rate during this period. Thus, local currency proceeds from coffee exports declined in the 1970s, despite the coffee boom in the second half of that decade, and increased significantly in the first half of the 1980s, thanks to successive devaluations of the shilling. Since the early 1990s, the two series have moved in tandem. Compared with the local producer price, the fob price in local currency appears to be much more volatile.

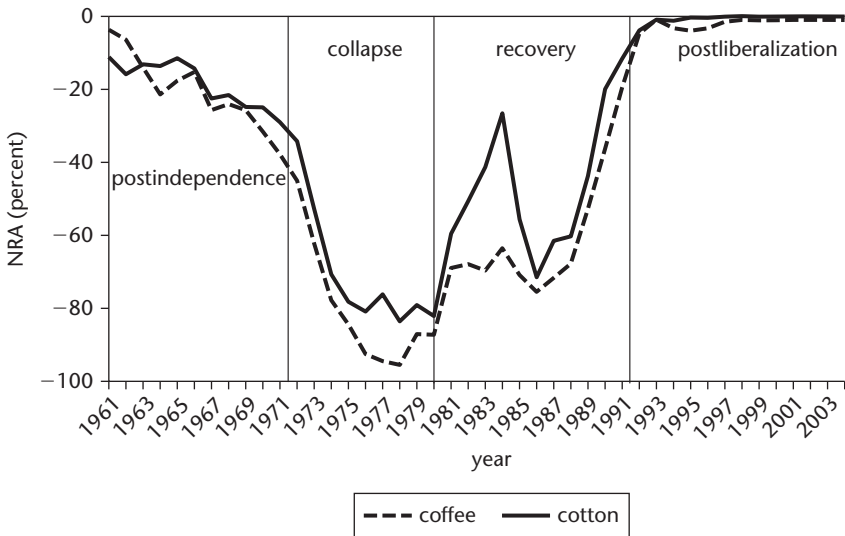
Real producer prices were stable in the 1960s but fell drastically during the 1970s. There was some recovery in the first half of the 1980s, but the nonadjustment of the nominal farmgate price in an environment of high inflation in the late 1980s again resulted in a serious loss of real value. It was only after liberalization that real prices recovered sharply. The reforms led to increased competition

among processors and exporters of coffee. Prices to coffee farmers not only went up following liberalization but farmers were also paid promptly, reportedly leading to a rapid reversal of the previous neglect of coffee trees. However, the collapse in international coffee prices since the mid-1990s, attributable in part the emergence of Vietnam as a serious competitor in robusta coffee, has been reflected in falling real producer prices as well.

Margins were high in the 1960s but collapsed during the 1970s, appearing to become even negative in some years. Margins recovered during the 1980s, leading the World Bank to report that “margins were set at or above average processing costs, and had grown to ‘comfortable levels’ by 1990” (World Bank 1993). That appears to have been the case, because margins have approximately halved in real terms since liberalization began in 1991. According to the NRI/IITA (2002), coffee supply chains are now reasonably competitive and efficient, with no clear areas within the supply chain where potential exists for major and significant reductions to transactions costs. All the evidence suggests that the domination of coffee marketing by the marketing board and cooperative unions in the preliberalization period led to marked inefficiencies, although we could not see this effect in the data.⁹ Because of the behavior of margins in 1975–85, margins before liberalization were no higher on average than they were after liberalization.¹⁰

The overall primary coffee NRA at the farmgate, including the distortion introduced by foreign exchange market misalignment, is shown in figure 12.2. This is

Figure 12.2. Coffee and Cotton NRAs, Uganda, 1961–2004



Source: Data compiled by the authors.

also the NRA at the processing level, given our assumption of equiproportionate pass-through. Coffee became increasingly taxed even in the immediate postindependence period, reaching a negative NRA of over -40 percent in 1971. However, the agony became worse during the 1970s, when the implied taxation of producers increased to reach a negative NRA of over -90 percent in the late 1970s. Although export taxation continued to weigh heavily, the main contribution to the NRA during this period came from the requirement to exchange foreign currency earnings from coffee exports at the increasingly unrealistic official exchange rate. The situation of coffee growers improved during the recovery period of the 1980s, with the setback in the mid-1980s coinciding with the stalling of the first effort at economic reforms. Only following the initiation of the economic recovery program in 1987 did a lasting improvement in the NRA take place, and since 1995 there have been no distortions in Uganda's coffee market.

Cotton

Cotton production and marketing has also been regulated by the government since colonial times. The licensing of ginneries was initiated in 1907. In 1933, the Cotton Zone Ordinance divided the country into fourteen zones and allocated an area to each ginnery in which it was the monopoly buyer. The government established a minimum pricing scheme, in collaboration with the ginneries, and a maximum charge was set for ginning and baling. The revised 1964 Cotton Act provided for the zoning of cotton production, the setting of fixed seed and cotton lint prices, restrictions on cotton imports and trade, and the licensing of ginneries. This system of controlled marketing and prices continued until 1993.

The Lint Marketing Board Ordinance of 1949 established the Lint Marketing Board with the right to purchase all cotton for export, although ginneries were still free to sell to domestic mills.¹¹ The price the board paid to the ginneries was fixed by the government based on the price the ginner had to pay to the grower, which was also fixed by the government. Thus both ginning and exporting had monopsony buyers—the cooperative unions and the Lint Marketing Board—working with captive clients on a predetermined margin (World Bank 1993). The lint was sold to exporters by auction in Kampala. Whether the board made a profit or loss on its operations depended on the price fixed for seed cotton in relation to world prices.

Cotton marketing reforms were undertaken in sequence since 1990, when earnings from cotton exports were allowed to be valued at the market exchange rate. From 1993 private buyers were permitted to buy cotton, but the cooperative unions continued to monopolize the ginning sector until mid-1995, when a transfer of ginneries to the private sector commenced. Cooperative unions continue to

play an important role in processing and marketing, but many now source their cotton through private buyers in addition to cooperative societies (Shepherd and Farolfi 1999). Information on cotton market costs and margins since liberalization is given in NRI/IITA (2002).

The Cotton Development Organization was established in 1994 to carry out regulatory and development activities. The agency publishes an indicative farmgate price at the beginning of each cotton season, which the ginneries treat as a maximum farmgate price (NRI/IITA 2002). It charges a levy of 35 percent of the value of seeds produced by a ginnery to cover the costs of a seed distribution fund. Ginneries that are approved sources of seeds can offset the cost of the levy by supplying farmers with seeds or by selling seeds to those ginneries that are not approved seed sources.

The international price for cotton lint (the Cotlook A Index) increased during the commodity price boom of the mid-1970s before declining to its lowest level ever at the close of the 1970s. It recovered in the early 1980s but has since displayed a declining trend. The Ugandan fob price (converted using the market exchange rate) has largely moved in tandem with the international price, with the exception of the mid-1970s. This is not surprising because cotton lint was sold at auction throughout the period.

In the early years of administered prices, the Lint Marketing Board had access to a price assistance fund built up on the basis of the profits earned in the bulk-purchasing era. During the 1950s, it had a deliberate policy of subsidizing the producer price, with the consequent losses covered by the price assistance fund. Producer prices were not adjusted to keep pace with inflation, however, and fell dramatically in real terms; by the 1970s the assistance policy had changed to one of producer taxation. Cotton production collapsed and smuggling increased as farmers tried to take advantage of better prices in neighboring countries. Prices recovered in real terms in the first half of the 1980s but have followed the downward trend in international prices since then.

The marketing and processing margin, calculated as the difference between the fob price (converted at the official exchange rate) less the export tax and producer price, has fluctuated widely. In years when the fob price increased, the margin also increased, and vice versa. This pattern is consistent with the observed behavior in the cotton market where the indicative price announced at the beginning of the season is treated as a fixed price and any volatility in the fob price is reflected in agents' margins rather than in the producer price. Margins were slightly larger, on average, after liberalization.¹² However, our method of calculating the producer price in this period could have exaggerated the margin. We took the indicator price as the producer price, although some observers believe the indicator prices in recent years acted only as floor prices. We conclude that the data do not allow us

to quantify the effects of marketing inefficiencies through a comparison of margins before and after liberalization, and thus we do not incorporate any estimate of marketing distortions in the cotton NRA.

Soon after independence, a moderate export tax was placed on cotton of around 15 percent of the (pretax) export price, and the NRA averaged about -13 percent. During the economic collapse in the 1970s, the export tax continued albeit at a slightly lower rate (see figure 12.2). The main contributor to the increased negative NRA was the requirement to convert cotton foreign exchange earnings into local currency at the increasingly overvalued official rate. Producer prices fell precipitately in real terms and cotton production collapsed. The steps taken by the new government in 1981 to devalue the shilling show up in an immediate reduction in the negative NRA, helped by the absence of export taxation in 1980-84. The collapse of the first reform program led to a further temporary overvaluation of the exchange rate, which shows up as an increased burden on farmers—the NRA reached -72 percent in 1986, just before the NRM government took power. By 1992, however, distortions had been effectively removed and the NRA was zero, although it was not until 1995 that the cotton market was fully liberalized.

Other farm products

The remaining commodities covered in this study can be classified into predominantly exportables, predominantly import-competing products, or predominantly nontradables. It is characteristic for the three tradables—maize, beans, and to a small extent, rice—that their status shifts between all three categories over the period. Cassava, groundnuts, plantains, yam, millet, and sorghum are treated as nontradables whose price is formed entirely domestically.

At independence in 1962, the government introduced minimum producer prices that were set higher than the equilibrium market prices for some crops. Buyers refused to buy at these prices, and there was no state institution to act as a buyer of last resort to support these minimum prices. In the case of groundnuts, the state required the cooperative unions to purchase at the minimum price. It guaranteed them against the losses involved, but such a system was not sustainable because there were no price assistance funds (as had built up for cotton and coffee) to fall back on. To address this deficit, the Produce Marketing Board was established in 1968. The stated purpose of this board was to stabilize the prices of food crops by buying when prices were low, storing the surplus, and releasing stock when prices were high. In addition, the board was exclusively responsible for the procurement and export of maize, beans, sesame (*simsim*), soybeans, and groundnuts.¹³ The board's influence as a market agent appears to have been insignificant, in part

because it had no facilities in rural areas to effectively buy from producers, and in part because its predetermined prices were lower than market equilibrium prices. Its role was limited to buying what was offered to it and selling mainly on request to government institutions (Ngategize and Kayobyo 2001). In 1989, the board's market monopoly of in foodstuffs trade was brought to an end. These market reforms were accompanied by the removal of restrictions on the movement of produce across districts in 1992 (Opolot, Wandera, and Atiku 2005).

Another marketing body, Foods and Beverages Ltd., was a government-owned trading company intended to protect consumers so that prices did not go beyond the controlled prices, to ensure constant supplies, and to protect domestic producers through import control. The company handled both exports and imports, but established private traders were allowed to import or export so that the state-trading enterprise should not become a monopoly.

Beans have been an export crop in Uganda, although during the 1970s they effectively became nontraded and in other years they have been an importable (leading to a sharp increase in the border price of beans in 1998, for example). In general, the producer price and the border price are closely aligned in years when beans are exported. Retail prices lie above both producer and border prices. Bean prices in real terms more than doubled after independence, but fell during the economic collapse of the 1970s, possibly because resources shifted from the traditional export crops into subsistence farming and staple crops. Real bean prices rose in the economic recovery period but stabilized later.

Maize is not a traditional staple food crop for Uganda's population, but it plays an important part in the rural and urban diet. Maize was one of the crops controlled by the Produce Marketing Board. Following the liberalization of the grain sector, there have been no significant policy, regulatory, or institutional constraints to its development. Maize marketing costs and margins after liberalization are given in NRI/IITA (2002). Maize producer prices (for grain) are closely aligned to the fob export price in the years when maize was exported; the prices diverge in years (such as 1969–70, 1980–82, and 1997–99) when the status of maize changed to a net importable. Retail and producer prices broadly follow the same pattern as for beans. Real prices increased after the independence period, fell during the 1970s, recovered somewhat during the 1980s, and have remained relatively stable since then.

Uganda produces a significant amount of rice but generally not enough to meet domestic demand, and in most years rice is an importable. Rice prices trended upward in real terms in the 1960s, and the limited information available on producer and retail prices suggests they too increased. Prices fell during the 1970s, and after some recovery in the first half of the 1980s, gradually trended downward. Between 1981 and 1995, the producer price closely followed the border price (the producer price refers to paddy rice and the fob price to imports of

milled rice, this is consistent with positive protection of local rice production during this period). Since 1994, domestic producer prices have exceeded the fob price, suggesting a further strengthening of protection.

Cassava is shown as an example of the other nontradables that all follow exactly the same NRA pattern. It is a major staple food in Uganda and is consumed either in fresh or dried flour form. Dried cassava had a complex marketing chain (NRI/IITA 2002). From harvest to purchase at the local store, cassava must be dried, bulked, transported, stored, milled, and finally retailed. This report gives an example of costs and margins in dried cassava trading between rural and urban areas based on data from early 2000. The markup on the producer price of 10,000 shillings per 100 kilograms was 200 percent. Fresh cassava trading is more streamlined, driven by the perishability of cassava roots, which are unsalable after five days. Margins are also higher, up to 400 percent in 2000, given the greater price and physical product risk borne by traders. Generally, the NRA for cassava and other nontradables was zero throughout the period.

Rice as an importable has always had positive protection. In the 1960s, this was due mainly to assumed tariff protection. Protection grew dramatically in the 1970s, largely because of exchange rate protection, and gradually subsided in the 1980s as the official exchange rate moved toward the equilibrium rate. The observed positive NRA during 1994–2004 is attributable exclusively to tariff protection. NRAs for maize and beans jump around but are generally low throughout the period. Positive protection occurred in years when these products became import-competing products, while negative protection represents the implicit exchange rate tax in years when they were exportables.

Aggregate NRA for the agricultural sector

The aggregate NRA for the primary agricultural sector is obtained by weighting the NRAs for individual commodity by their undistorted value of production. NRAs are also calculated for each subgroup of exportables, import-competing products, and nontradables (table 12.1 and figure 12.3). The commodities examined account for 75–85 percent of the total value of agricultural output (at undistorted prices). The noncovered farm products were allocated to each of the three groups. In the case of exportables among this group, we assume that the foreign exchange rate misalignment was the sole source of distortions. In the case of import-competing products, we assume that the sources of distortion included the foreign exchange rate misalignment as well as the applied tariff rate.¹⁴ The main import-competing commodities not covered are sugar, dairy products, wheat flour, vegetable oils, and meat products. In the case of nontradables, we assumed that the sole source of distortion was the differential application of value added tax after 1995.

Table 12.1. NRAs for Covered Farm Products, Uganda, 1961–2004
(percent)

Product indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Exportables ^{a,b}	-8.9	-15.4	-43.7	-89.8	-66.6	-65.0	-9.6	-1.3	-0.3
Cotton	-13.4	-18.9	-42.3	-79.6	-52.0	-58.5	-7.5	-0.2	0.0
Coffee	-11.4	-21.7	-50.9	-90.8	-71.5	-67.7	-13.0	-2.1	-1.0
Tea	-1.1	-6.5	-36.4	-77.6	-52.0	9.9	7.5	0.2	0.0
Import-competing products ^{a,b}	16.5	22.3	42.6	79.0	54.1	57.8	14.8	13.9	15.0
Nontradables ^{a,d}	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.3
Cassava	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.3
Millet	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.3
Yam	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.3
Plantains	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.3
Sorghum	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.3
Groundnuts	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.3
Mixed trade status ^a									
Rice	13.7	19.7	42.8	48.0	54.5	45.5	4.2	13.1	17.3
Maize	-1.0	3.4	15.0	0.0	25.8	-18.6	-7.5	6.5	0.0
Bean	5.9	1.6	-3.2	0.0	0.0	0.0	-3.5	3.8	-0.1
Sugar	-1.0	-6.5	20.2	15.4	34.7	57.8	14.7	16.1	16.9
Total of covered products ^a	-3.0	-5.1	-11.6	-24.5	-11.5	-14.1	-1.1	0.6	0.5
Dispersion of covered products ^c	8.1	12.1	24.3	46.6	43.2	40.5	7.8	6.6	6.9
Percent coverage (at undistorted prices)	83	84	87	86	75	77	75	79	77

Source: Data compiled by the authors.

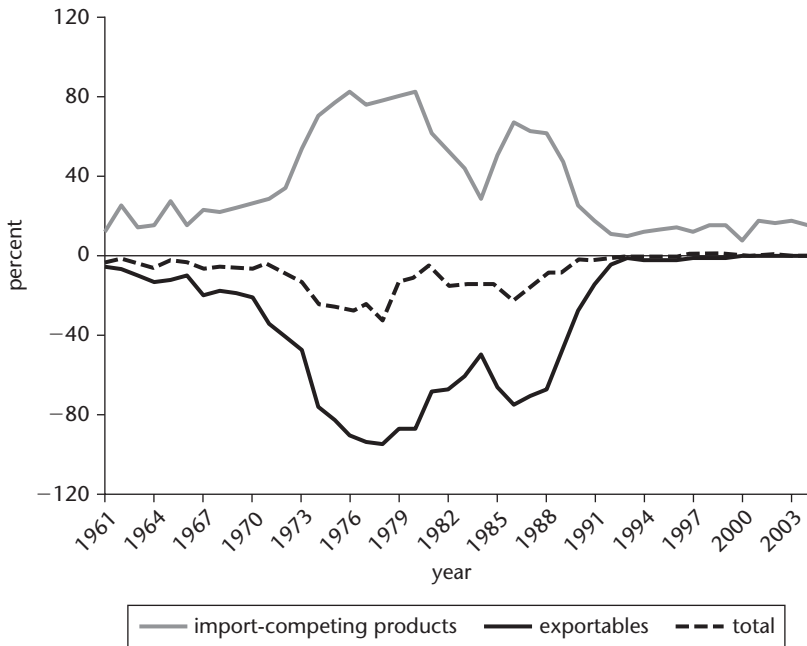
a. Weighted averages, with weights based on the unassisted value of production.

b. Mixed trade status products included in exportable or import-competing groups depending upon their trade status in the particular year.

c. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

d. Nontradables cassava, millet, yam, plantains, sorghum, and groundnuts have the same NRA as the nontradables average in all periods.

Figure 12.3. NRAs for Exportable, Import-Competing, and All Farm Products, Uganda, 1961–2004



Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

The main exportables not explicitly covered are tea and tobacco. Tobacco is the second largest cash crop after coffee. Tobacco production, processing, and marketing are vertically integrated. Inputs and extension services were provided as a package to farmers on credit. Production peaked in the early 1970s but collapsed during the late 1970s when management was brought under the monopoly of the National Tobacco Corporation. There was a divestiture of the industry to British American Tobacco in 1984. The tobacco industry has since been opened to other competitors, although British American Tobacco continues to control up to 93 percent of the market.

Tea in Uganda is grown mostly on large estates because of its more rigorous processing requirements although small-holder tea production has existed since 1966. Management of the tea industry was originally under the control of the Uganda Tea Association, a voluntary association of tea producers established in 1948. In 1972, the Uganda Tea Authority took control, but production

subsequently collapsed in 1979 when war forced closure of the factories. In 1983, the industry was liberalized and the Uganda Tea Association was revived. Since then, policy reforms such as the removal of the Uganda Tea Authority monopoly on exports, valuation of export proceeds at the market exchange rate after 1987, and liberalization of export marketing have stimulated production. For both sectors, taking account of the exchange rate misalignment may underestimate the extent of distortions at certain periods, but the impact on the overall NRA is likely to be small.

The results of our calculation show marked differences in the stance of policy toward the three main groups. Most striking is the heavy taxation of exportables until the 1990s. The situation for producers of exportables deteriorated in the 1960s and worsened further during the 1970s. Much of this deterioration was driven by the overvalued exchange rate and the gap between the official and parallel market rates which grew enormously during this period. Matters improved, but only slightly, in the 1980s. Only in the first half of the 1990s did a major improvement occur, and since 1995 all direct distortions against exportable crops have been effectively removed (see figure 12.3).

The situation for import-competing products was almost the mirror opposite, again mainly driven by exchange rate movements. From a moderate level in the 1960s, protection increased substantially in the second half of the 1980s. Particularly during the 1970s, when agrifood imports required the purchase of foreign exchange at the parallel market rate, there was very large positive protection of import-competing agricultural sectors in Uganda. As the foreign exchange market gradually returned to equilibrium at the beginning of the 1990s, the implicit protection of import-competing products also fell, although it continued at a relatively modest rate during the 1990s and the early 2000s, mainly representing continuing tariff protection of these commodities (see figure 12.3).

Given our assumption of the ineffectiveness of the Produce Marketing Board, there were no policy interventions that affected the incentives to produce nontradable agricultural products over the period. After 1990 there was a very small negative bias stemming from the operation of the value added tax system. Thus, despite the very large swings in the distortions affecting the two tradable subsectors of agriculture, the overall (negative) NRA indicator for agriculture remained at modest levels—a result of the predominance of largely nontraded food crops in Uganda's agricultural production, and the relatively small share of these crops that were marketed; most of this production was consumed by the growers themselves. While the overall magnitude of the distortions remained low throughout the period, the strong bias against export crops undoubtedly held back the development of the sector.

Nonagricultural NRAs

As already mentioned, the total effect of distortions on the agricultural sector depends not just on the size of agricultural policy interventions but also on the magnitude of the distortions generated by direct policy measures in nonagricultural tradable sectors. The RRA measures the size of distortions in agriculture relative to those in other sectors. The higher the nonagricultural NRA, the more other sectors are in a position to attract resources away from the agricultural sector, adding further to the discrimination against this sector or reducing the value of any direct positive assistance that may be granted to farmers.

Various policy measures were included in the computation of the nonagricultural NRA. We included customs duties, export taxes (which were imposed on copper and hides and skins in some years up to 1977), the import commission and withholding tax, and the differential application of sales tax and value added taxes (the calculations are described in the appendix to Matthews, Claquin, and Opolot 2007). Other nontariff barriers could not be included because of an absence of specific information; these may have been important in earlier decades but were eliminated after liberalization. Exportable nonagricultural goods were heavily taxed throughout the 1970s and 1980s, largely through the unfavorable exchange rate regime, while import-competing products were strongly protected in the 1960s and 1970s by the distorted exchange rate regime and more recently by effectively higher value added tax rates and import tariffs. Overall, relatively limited protection of around 8 percent in the late 1960s increased to 15–20 percent during the 1970s and 1980s, before falling back to 9–13 percent during the 1990s and early 2000s.

The resulting NRAs for nonfarm tradables, and the RRA, are shown in table 12.2 and figure 12.4. The trend in the RRA can be divided into four periods. During the 1960s, the RRA was initially negative but small. During the Amin period in the 1970s, the position of agriculture worsened considerably, mainly because of an increase in support to the nonagricultural sector that averaged over 50 percent; however, an increase in direct distortions also negatively affected agriculture. The 1980s saw limited dismantling of the heavy antiagriculture bias in government policy, with the RRA averaging just under –50 percent; that was still worse than the level that prevailed at the beginning of the 1970s. The improvement in the RRA resulted primarily from an improvement in the agricultural NRA, although the level of protection for the nonagricultural sector decreased slightly. The RRA continued to improve in the 1990s and the early 2000s. Indeed, by 2004 there was now some small positive protection of the agricultural sector arising from direct policies alone, including the continued protection of import-competing products and a complete abolition of government interventions on

Table 12.2. NRAs for Agriculture Relative to Nonagricultural Industries, Uganda, 1961–2004
(percent)

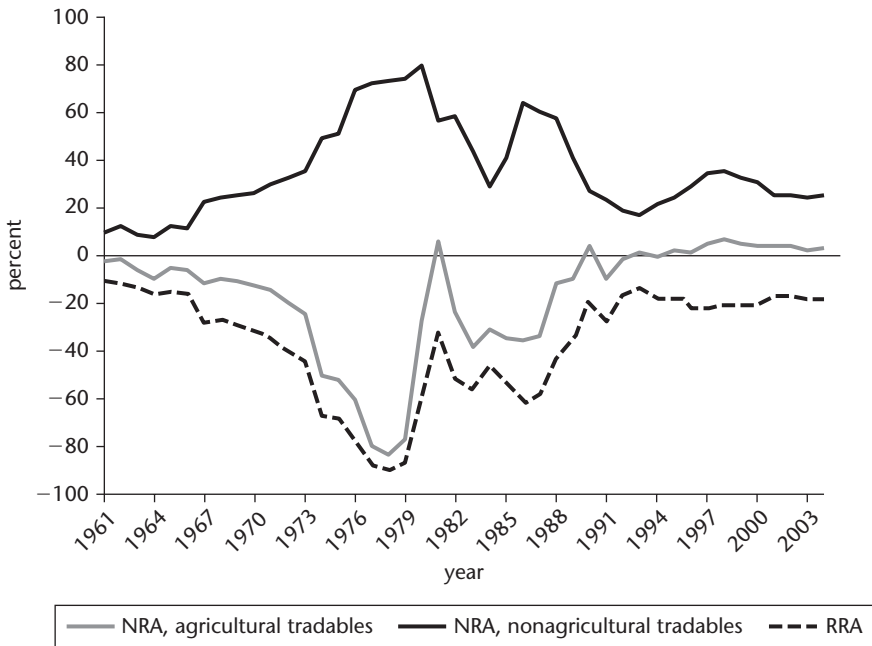
Indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRA, covered products	-3.0	-5.1	-11.6	-24.5	-11.5	-14.1	-1.1	0.6	0.5
NRA, noncovered products	4.4	7.2	16.9	18.6	10.7	17.0	0.8	0.2	-0.1
NRA, all agricultural products	-1.8	-3.1	-7.8	-19.2	-5.9	-6.8	-0.6	0.5	0.4
Trade bias index ^a	-0.20	-0.30	-0.58	-0.94	-0.77	-0.77	-0.21	-0.13	-0.13
NRA, all agricultural tradables	-4.6	-8.6	-24.3	-70.6	-22.8	-25.1	-1.3	4.0	3.4
NRA, all nonagricultural tradables	9.6	19.4	34.9	68.1	53.6	52.9	21.6	31.0	26.1
RRA ^b	-13.0	-23.1	-43.1	-82.1	-49.5	-50.6	-18.8	-20.6	-18.0
Memo item, ignoring exchange rate distortions:									
NRA, all agricultural products	-1.5	-1.5	-0.6	-3.1	-1.4	-0.8	-0.5	0.5	0.4
Trade bias index ^a	-0.20	-0.25	-0.36	-0.70	-0.54	-0.53	-0.16	-0.13	-0.13
RRA ^b	-12.0	-15.7	-11.0	-39.8	-15.7	-5.6	-13.2	-20.5	-17.9

Source: Data compiled by the authors.

a. Trade bias index is $TBI = (1 + NRA_{ag_s}/100)/(1 + NRA_{ag_m}/100) - 1$, where NRA_{ag_m} and NRA_{ag_s} are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

b. The RRA is defined as $100 * [(100 + NRA_{agt}) / (100 + NRA_{nonagt}) - 1]$, where NRA_{agt} and NRA_{nonagt} are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 12.4. NRAs for Agricultural and Nonagricultural Tradables and the RRAs, Uganda, 1961–2004



Source: Data compiled by the authors.

Note: For a definition of the RRA, see table 12.2, note b.

exportables. The limited protection of agricultural production is slightly smaller than the assistance to producers of nonagricultural goods, however, so the RRA is slightly below zero.

Conclusions

The results reported here suggest a number of important conclusions. First of all, we note that the data are limited and the measurement of distortion rates could undoubtedly be improved. For example, we have not taken into account the impact of input market distortions. The use of purchased farm inputs is very limited, however, so this omission is unlikely to significantly alter the conclusions. More importantly, we have not been able to take into account all of the impact of state control over agricultural marketing before liberalization. We did not find evidence that margins were higher in this period, but there were probably inefficiencies that adversely affected farmers and yet are not captured in the published

prices, such as the effect of delayed payment, the impact of the Uganda Railways monopoly on the transport of coffee to the coast, or the restrictions on food marketing across regions. Finally, nontariff barriers to imports of nonfarm products in the preliberalization period mean we underestimate the size of the negative RRA in those years.

Despite the caveats described above, the broad story that emerges from our limited data is plausible. In the early years of independence, agricultural incentives were broadly neutral, although positive protection to the nonagricultural sector meant that some discrimination existed against the agricultural sector. The shift to a state-led development strategy in the late 1960s was reflected in increased direct taxation of the agricultural sector, particularly of export crops. However, the NRA for the agricultural sector as a whole turned only slightly negative. Despite the importance of the cash crop sector as a source of foreign exchange earnings and in underpinning the growth of the monetary economy, most Ugandan agricultural production consisted of, and still consists of, staple food production, much of it of a subsistence nature and composed predominantly of nontraded products. Despite regulations affecting food marketing, and the existence of the Produce Marketing Board for much of the period, the evidence suggests that food markets remained mainly local and were not much affected by direct policy interventions. This explains the resilience of the sector when incentives for the exportables sector were totally undermined during the 15 years of economic chaos between 1971 and 1986 and the early hesitation in introducing reforms by the new government in 1986. Much of this distortion resulted from the substantial overvaluation of the shilling during those years, which gave significant protection to import-competing substitutes, although the overall extent of economic disorder meant that the agricultural sector received little benefit from these incentives. The nonagricultural sector was potentially a bigger beneficiary from the overvalued exchange rate, but the impact of other events that cannot be captured in price policies, such as the expulsion of the Asian business community or the effect of war on industrial capacity, severely limited any likely benefits there.

Liberalization of agricultural marketing began in earnest in 1991, and the subsequent 13 years saw a remarkable change in policy toward the agricultural sector. Direct disincentives were eliminated, while direct assistance to the nonagricultural sector remained relatively unchanged over this period, at around 8 percent, despite the simplification and reduction in nominal tariff rates. Thus there continued to be some relative discrimination against the agricultural sector in Uganda, but it was tiny compared with previous periods.

Despite this improved policy environment for agricultural growth, the sector remains in great difficulty. Even after liberalization, real value added in primary

agriculture has grown at markedly lower rates than the average for the overall economy, and is only slightly higher than the rural population growth rate of 3 percent a year. Producer prices close to the cost of production threaten the viability of the coffee and cotton sectors. Improving profitability will be dependent on improved efficiencies in production, marketing, and processing. Also, rural infrastructure remains very poor. Considerable effort has been put into roads improvement; the average distance of households to a tarred road fell from 32 kilometers in 1997 to 22 kilometers in 1999/2000, and communities on average live within 2 kilometers of all-season feeder roads. But access to electricity in rural areas remains low: only 12 percent of all villages and only 2.1 percent of all rural households have electricity connections in Uganda, rates that are among the lowest in the world. The implicit taxation of exports caused by poor infrastructure and high transport costs in 1994 was estimated to be equal to nearly two-thirds of value added. Correspondingly, transport-induced trade barriers provide effective protection for domestic sales even after liberalization. These “nonpolicy” barriers to trade have been blamed for the sluggish response of the Ugandan economy to the extensive trade policy reforms undertaken over this period (Milner, Morrissey, and Rudaheranwa 2001).

Uganda’s current economic strategy as laid out in its Poverty Eradication Action Plan sets the long-term goal of reducing the incidence of income poverty in Uganda from 44 percent in 1997 to less than 10 percent by 2017. Agriculture still dwarfs any other sector in terms of its share of economic activity and employment and as a source of income, especially for poor people. The potential for growth resulting from economic reforms and rehabilitation of the economy from the past devastation had largely been exploited by the mid-2000s. There is a need to focus more systematically on raising the growth rate of agricultural production to supply domestic, regional, and overseas markets.

Raising existing levels of protection to the agricultural sector as a way of providing additional incentives would be a fruitless strategy. Tariff protection to industry, although lower in nominal terms than on agricultural products and food processing, does contribute to a relative bias against agricultural production simply because of the greater importance of import-competing products in domestic nonagricultural production. However, it would be better to deal with this discrimination through a further reduction in manufacturing tariffs rather than by raising agricultural tariffs. The latter would benefit a very small subset of agricultural products—wheat, dairy products, sugar, vegetable oils—where the impact on poverty of increased production, except perhaps in sugar, would be limited.

Ugandan agriculture now needs to concentrate on improving its competitiveness through a supply-side investment strategy, including in agricultural research

and extension and rural infrastructure. The key to this strategy is additional investment in rural areas, not higher protection. The government's Program for the Modernization of Agriculture points in the right direction (Government of Uganda 2000). If Uganda is to meet the poverty reduction targets set out in its poverty eradication plan, then investment in enhancing agriculture's supply capacity must be given much higher priority both in government budget allocations and in donor aid flows than is currently the case.

Notes

1. The figures in this paragraph are drawn from Sandri, Valenzuela, and Anderson (2006), based on the *World Development Indicators* of the World Bank (2006).

2. More extensive reviews of economic policy during this period are Bigsten and Kayizzi-Mugerwa (1999), Reinikka and Collier (2001), and World Bank (1987).

3. These nutrition trends based on agricultural statistics are not consistent with the figures quoted earlier for the very significant decline in income poverty during this period, as reported by household budget surveys, and suggest that there may be underreporting of agricultural production in Uganda.

4. With a base of 1980 = 100, the consumer price index topped 150,000 by mid-1992, largely attributable to the devastation caused by wartime inflation. Only the Democratic Republic of Congo (then Zaire) had a worse experience (Donovan 1996).

5. The Food and Agriculture Organization's FAOSTAT data were checked against national sources and mistakes and errors corrected.

6. A World Bank paper reported that certain tea plantation companies with access to foreign exchange at official rates found it privately profitable to purchase tea-picking machines, even though hand picking was more cost-effective from the standpoint of the economy as a whole (quoted in Donovan 1996).

7. See Nkonya and Kato (2001) for a description of agricultural input marketing.

8. Bigsten reports that the creation of a Mombasa-Kampala express cargo train service and removal of the need to unload merchandise at the border for customs purposes cut transport time to Kampala from two weeks to two days (Bigsten 2000).

9. There were instances, most notably in 1988, when the marketing board was unable to pay farmers for new deliveries of coffee or to repay loans for previous purchases and when the government had to step in to provide funds to meet these obligations. Such subventions should, in principle, be netted off against export tax receipts in any year. In the absence of data, however, we had to ignore this offset.

10. We estimated a simple ordinary least squares regression (OLS) of the margin on time with a dummy variable taking the value of 1 for the years before liberalization (up to and including 1990). The coefficient on the dummy variable yields the excess marketing margin before 1990. However, the coefficient on the dummy variable was not significant, and thus we have not counted any marketing board distortion in the computation of the coffee NRA. The OLS regression gave the following results (with t statistics in brackets): for the time trend -0.056 (-1.77), preliberalization dummy 0.110 (0.11). The overall adjusted R^2 was only 0.064 .

11. The Lint Marketing Board purchased from the ginners all lint and cotton seed produced, and the ginners were compelled by law to sell all their production to the board.

12. This is confirmed by the results of a simple OLS regression of the margin on time with a dummy variable taking the value of one for the years after liberalization (1995 and after). Although the goodness-of-fit is low, the margin exhibits a slight (although significant) downward trend over time and the dummy variable is positive and significant. The coefficient on time is -0.058 with a

t value of -2.02 , the coefficient on the liberalization dummy is 3.637 with a t value of 4.2 , and the adjusted R^2 is 0.29 .

13. Ugandan notifications to the General Agreement on Tariffs and Trade on state-trading enterprises give different dates regarding the origin and functions of the Produce Marketing Board. The 1963 notification stated that the main function of this board was to provide or create efficient marketing facilities for all controlled "minor" cash crops, defined as wheat, maize, beans, soya beans, tobacco, sorghum, and millet. According to the 1970 notification, the Produce Marketing Board was established by Act of Parliament (Laws of Uganda Act 37 of 1970) to give guaranteed minimum price to farmers, to facilitate export sales, and to protect domestic producers and consumers by regulating both exports and imports. The board was both importer and exporter of produce. Private traders were allowed to export and import with the approval of the board. Board approval for exports depended on there being no shortage of the produce in question.

14. Support for this procedure can be found in the comment that, in 1991, the wholesale price of sugar charged by the two sugar factories was comparable to the price charged by importers of sugar after tax and duty (World Bank 1993).

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PART V

WESTERN AFRICA

CAMEROON

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and William A. Masters**

Cameroon is among the more prosperous countries in Africa, thanks to relatively abundant agricultural land and offshore petroleum. These spurred an economic boom from 1972, when the country was unified, until 1986. But for the next decade, the economy declined, and it has enjoyed only a limited recovery since 1995. Social indicators also declined. Primary school enrollment rates fell from nearly 100 percent in the 1980s to 62 percent in 1997, and the child mortality rate worsened from 139 per 1,000 in 1990 to 151 per 1,000 in 1995, and the rate was still 149 in 2006 (World Bank 2008). Over the past decade, poverty has remained widespread. In 2001, 17 percent of the population had income of less than \$1 dollar a day in purchasing power parity terms, and 51 percent had income under \$2 a day (World Bank 2006).

Before the economic crisis of the late 1980s, Cameroon's development strategy efforts were managed through a series of five-year development plans. In these plans, agriculture was described as the priority sector, and the government intervened massively in rural development, both directly, through the establishment of state-owned agroindustries, rural corporations, and settlements, and indirectly, through various support programs. Later reforms and the currency devaluation of 1994 improved performance by allowing more market incentives to play a role. In this chapter, we use the methodology of Anderson et al. (2008) to quantify the evolution of those distortions to farmer incentives, measuring the incidence of

* The authors are grateful for helpful comments from several Cameroonian colleagues and workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Bamou and Masters (2007).

government policy on producers and consumers each year in Cameroon from 1961 to 2004. For each of the major activities, we compute nominal rates of assistance (NRAs), which are then aggregated into a variety of other indexes.

Before discussing the NRAs, the chapter provides a brief overview of agriculture's role in the economy over the study period and a summary of the main agricultural policy incentives, interventions, and reforms. After describing the country's growth performance over time, the chapter analyzes the estimates of government distortions to agricultural incentives and then speculates on prospects for future policy reform.

Agriculture's Role in the Economy

Cameroon is a bilingual country. Its French- and English-speaking regions were granted independence on January 1, 1960, and October 1, 1961, respectively, and were united in 1972. At independence, about 85 percent of the people lived in rural areas and relied principally on agriculture for their livelihoods. Since then, the country has urbanized faster than most other African countries. By 2005, the share of the population living in rural areas was estimated to have fallen below 50 percent, compared with an African average of 64 percent (FAOSTAT 2006).

As oil exports grew after 1977, the resulting Dutch disease turned incentives against production of all other tradable products and contributed to stagnation in both industry and agriculture. The boom in the oil and services sectors squeezed out other activities, whose share of gross domestic product (GDP) sometimes fell below one-third (Benjamin and Devarajan 1989; Blandford et al. 1995). Agriculture is particularly vulnerable to the Dutch disease, since its output is largely tradable, whereas the land and labor inputs are nontradable. There were also some shifts in production within the sector, as described by Courade and Alary (1994), Janin (1996), and Touna Mama (1996). Changes in input use were also important, particularly after the government phased out its subsidies for fertilizers, pesticides, and herbicides in 1989–92 (Ndoye and Kaimowitz 2000; Sunderlin et al. 2000).

Main Agricultural Policy Incentives, Interventions, and Reforms

The evolution of Cameroon's agricultural policy may be divided into four phases. The first phase runs from independence to the end of the 1960s and is marked by a continuation of French and British colonial agricultural policies and institutions. The second, characterized by a proliferation of new agricultural interventions, covers the late 1960s to the late 1970s. A third phase, marked by attempts at agricultural policy reform, runs from the late 1970s to the late 1980s; and the

fourth phase, dominated by agricultural policy liberalization, began around 1990 and continues into the 2000s.

Colonial agricultural policies and institutions

Cameroon was colonized first by the Germans (1894–1916) and later by the French (1916–60) and British (1916–61), who partitioned the country between them. Agriculture was characterized by a strong dualism between European-owned, large-scale plantations and Cameroonian peasant smallholdings. Agricultural policies were closely linked to the politics of colonialism, as well as to the changing economic conditions in the colonies. Emphasis was placed exclusively on export crops.

At the start of colonial rule, development of the indigenous food sector received little attention or was actively discouraged when it conflicted with the labor needs of the large, European-owned plantations. The colonial administrations took numerous measures to stimulate the creation and expansion of plantations: large expanses of fertile land were appropriated from natives without compensation and given to planters; taxation, forced labor, and other methods were used to ensure an abundant and cheap labor supply to the plantations; and a network of transportation and marketing facilities was developed to serve the plantation areas and link them to the coast (Ntangsi 1988).

Because large farms are relatively inefficient producers of most crops, colonial powers eventually shifted their emphasis to peasant production, which provided the basis for the rapid expansion of exports (Secrétariat Général du Gouvernement 1961). As peasant production expanded, an attempt was made to extend roads and railways beyond the plantation areas into the major peasant-producing areas.¹ Several agricultural institutions were established to provide extension and marketing services to farmers. On the French side, the most important of these was the *Secteurs de Modernisation*, financed by *Fonds d'Investissement pour le Développement Economique*. It provided a tight network of technical and crop-oriented extension services as well as seed production, pest control, and some agroprocessing activities such as rice milling. The *Société Africaine de Prévoyance* provided credit, and the *Caisse de Stabilisation* handled marketing. Specialized research institutes were also established for cotton (*Compagnie Française pour le Développement des Fibres et Textiles*), for cocoa and coffee (*Institut des Fruits et Agrumes*), and for palm oil (*Institut de Recherches sur les Huiles et Oléagineux*). On the British side, there was less emphasis on small-holders, where priority was given to private, large-scale plantations operated by the Cameroon Development Corporation, Elders and Fyffes Ltd., and others. A Department of Agriculture, Cooperatives, and Community Development provided extension services and research, and a marketing board marketed export crops.

The 1960s

Substantial continuity in the colonial agricultural policies and institutional structure characterized the period immediately after independence. Until 1972, the country was ruled under a federal system with two states, East and West Cameroon. The Department of Agriculture and Rural Animation was created in 1964 under the federal Ministry of Planning to coordinate the agricultural development efforts of the two states. Implicit in the first five-year development plan (1961–65) was an approach to agriculture referred to as the diffusion-modernization model, which viewed peasant small-holders as the agents of agricultural development. Government intervention was limited to research, extension, provision of inputs, and other services that would encourage adoption and progressive diffusion of farming innovations.

Signs of dissatisfaction with the outcome of the diffusion approach were noted in the second development plan (1966–70), which clearly stated that, notwithstanding the satisfactory performance of the agricultural sector, growth in output had come from increases in the area under cultivation and not from gains in yield. This second plan envisaged experimentation with other forms of intervention structures in agriculture and new forms of production, and in 1972 the unification of the country and creation of a new Ministry of Agriculture led to substantial modification in the colonial institutional structure.

The 1970s

As in most countries around the world, Cameroon in the late 1960s and early 1970s saw a movement toward greater intervention in agriculture, with the direct involvement of government in functions hitherto carried out by the private sector, such as distribution of agricultural inputs and marketing of food crops. In Cameroon, increased government intervention and planning was concentrated on the plantation sector, with almost complete neglect of small-holders. In fact, indirect taxation of peasants increased through the National Produce Marketing Board, which had been created mainly for cocoa and coffee. This period also witnessed the multiplication of new intervention institutions and new forms of production as recommended by the second plan.² By 1970, a total of 10 parastatal development agencies had been created, and 14 more were formed under the third plan during 1971–75. Under the fourth plan (1976–80), the government attempted a further expansion of intervention, proposing some 20 new projects. Most of these were never implemented, however, because foreign aid donors were no longer willing to fund them.

The growth of Cameroon's state-led agricultural interventions in the 1970s was supported by donors for a variety of reasons. These agencies were to be run as

quasi-private enterprises, with administrative, technical, and financial autonomy and therefore potential efficiency. In addition, most of the projects aimed to combine marketable output with basic farmer needs, an idea that fitted very well within the basic-needs approach to rural development widely adopted by donors and the international intellectual community during the early 1970s. But Cameroon's attempt to create a modern agricultural sector through this kind of intervention proved to be very costly and had only a marginal impact on total agricultural output. The proliferation of new institutions and structures was particularly counterproductive. Agencies were supervised by different government ministries with little coordination of activities. Lines of responsibility often overlapped, agencies worked at cross purposes, and leaders were occupied in power conflicts among themselves. The poor performance of the interventionist strategy led to donor retreat and helped to awaken government doubts about the approach.

The 1980s

Cameroon's oil boom began in 1977, the same year farmers were offered a large increase in real producer prices for cocoa, coffee, and cotton. Those gains were quickly eroded by subsequent inflation, however, and on balance agricultural production was heavily burdened during the boom years.

During the boom, three distinct kinds of resource misallocation became increasingly severe. The most fundamental were classic Dutch disease misallocations stemming from unsustainable price incentives, which limited investment in small-holder agriculture. Before the oil boom, the sectoral balance had already leaned heavily against agriculture as a whole, and within agriculture, resources were concentrated in the relatively small estate sector, which produced no more than 10 percent of total agricultural output. These biases worsened during the boom, which made small-holder farming even less attractive and increased the number of unskilled workers seeking nonfarm work.

A second kind of misallocation came about because of the unsustainable management structures within government institutions. Before the oil boom, an extreme centralization of decision making had resulted in heavy red tape and fragmentation of responsibilities in the bureaucracy and the extension service, which led to poor policy implementation and misallocation of what little expenditure was targeted to small-holder agriculture during the boom.

A third kind of misallocation was underinvestment in new technology. Although Cameroon did have a significant public agricultural research and development program, during the boom there were few incentives for technology adoption, so yields for most crops stagnated or declined (MINAGRI 1980).

All three kinds of problems were widely recognized in Cameroon during the oil boom, but significant policy change did not take place until the boom ended and the debt crisis of the mid-1980s made reform unavoidable.

Continuing liberalization since the late 1980s

Faced with a brutal fall in living standards after 1986, the government felt it had to implement structural adjustment programs supported by international donors. Sector-specific policy reforms in agriculture included both privatization and liberalization. Those reforms targeted input production, transfer of technology and know-how through research and development, marketing, training, and information as well as sanitary and phytosanitary control. The reforms aimed to guarantee food security, promote and diversify agricultural exports, and increase income in the rural area.

The reforms that attracted the greatest attention involved liberalization of product marketing. The Food Crop Development Authority and the National Produce Marketing Board, which had controlled cocoa and coffee, were both liquidated along with many other development agencies. Their withdrawal improved average incentives, but for many products and regions very few private traders were available, so marketing costs for these farmers actually rose, at least temporarily. This deterioration of local marketing conditions inhibited farmers' production, which in turn limited the speed and number of new entrants into private trading to serve these markets.

Liberalization of international trade involved gradual abandonment of the existing quantitative restrictions and the adoption of a simplified tax system. With the adoption in 1994 of a regional fiscal reform program initiated at the subregional level through the Economic and Monetary Community for Central Africa, tax rates on exports and imports of agricultural and food products were simplified, and average taxation rates were reduced (Bamou, Njinkeu, and Douya 2003).

On the input side, one particularly important set of changes were two programs—one launched in 1987 with the assistance of the U.S. Agency for International Development and the other launched in 1988 with the support of the European Development Fund—aimed at creating an effective private system for importing and distributing fertilizers. But Ntsama (2000) found that importers formed an oligopoly that enabled them to fix sale prices at an unusually high level relative to cif (cost, insurance, and freight) values. In general, Ntsama argues that the fertilizer programs were more concerned with serving existing importers than with expanding the size of the market; for example, the programs did not offer a credit mechanism to expand the number of farmers able to buy fertilizers.

Retrenchment in the public sector hit all kinds of services, including agricultural research for new crop varieties and growing techniques. Despite the promising

results recorded by Cameroonian research programs and the desperate need for yield-increasing technologies at that time, funding levels for these activities fell significantly. In nominal terms, agricultural research institutes received CFAF 5.9 billion in fiscal 1984/85 (of which 95 percent was from the state), whereas between 1992 and 1994 they received only CFAF 5.7 billion of which only 58 percent was from the state, and 42 percent had to be sourced from external resources (IRAD 1996).

The public national system for agricultural education was virtually abandoned, with increasingly degraded facilities and weak staff. Its training programs were unsuitable, current budgets and equipment insignificant, installations and equipment poor, and trainers demoralized and lacking regular work. Private educational institutions emerged that were better equipped with human and financial resources, but they covered a limited range of skills and served only some regions of the country (Matiké, Bidja, and Kapto 2001).

The national extension system was less affected by the cutbacks, although it did face a slowing down of its activities. The National Agricultural Extension and Research Program launched in 1990 by the government with the financial assistance of the World Bank made it possible to reinforce the extension services, but the value of extension to farmers was constrained by the limited availability of new technologies from research.

After the liquidation of the Cameroon Agricultural Bank (*Crédit Agricole*) in 1997, only a few parastatal or private agroindustrial enterprises were able to offer farm production loans. Smaller and more remote farmers have no access at all to formal credit. The emergence of financial intermediaries has been limited by high risk and limited availability of collateral, so farmers must rely on loans from family members and local informal lenders. Some microfinance has been available through donor-funded institutions, but these remain poorly distributed in the country and sometimes lack credibility and professionalism, with no links between them and commercial banks.³

A very important and ambitious area of reform concerns the use of forest land, launched in 1994 with the approval of a new forestry law (Law 94-01). Reforms in forest use are based on an effort to clarify the rules of the game and enforce them with strong institutions that enjoy high-level political support; to draw a clear separation of functions between public institutions and private entities and collaborative frameworks to enable collaboration among actors; to ensure that conservation of globally relevant biodiversity contributes to, rather than hinders, local economies; and to use transparency and public information in the fight against corruption and vested interests. As detailed by Kazianga and Masters (2006), appropriate changes in property rights can have a powerful influence on the adoption and effects of new technology in this context, particularly for cocoa, which is typically planted in forest areas.

Finally, despite the withdrawal of the government from most agricultural activities, the semi-arid north part of country has continued to benefit ever since independence from special government agricultural policies, such as food grants, incentives for food crops production, and cotton extension and marketing services. This political support has typically been preserved over time, although with varying effectiveness.

Growth Performance and Agricultural Output

Before and during its oil boom, Cameroon experienced rapid economic expansion. From 1973 to 1986, incomes grew by more than 7 percent per year (Bamou and Masters 2007, appendix figure 1). Growth was led by an unsustainable expansion of the agricultural sector, followed by petroleum exports and government borrowing (Benjamin and Devarajan 1989). Oil revenue shot from zero to 46 percent of exports between 1978 and 1982, and domestic absorption soared to 103 percent of GDP, driven by massive government spending (World Bank 2004). Resource abundance allowed the government to pursue an inward-looking import-substitution industrialization strategy, supported by a restrictive trade policy and fiscal subsidies. This contributed to higher inflation (10 percent over the period 1977–85), primarily resulting from price increases for nontradables and higher real wages, as measured by rising unit labor costs and an appreciating real exchange rate. The resulting deterioration in competitiveness led to a sharp decline in non-oil exports (agriculture and manufactured goods), while imports surged with domestic absorption, contributing to the deterioration of the trade balance, which eventually led to the unsustainable indebtedness of the 1980s.

The accumulated consequences of these policy choices slowly unwound in the long downturn from 1986 to 1993, and the country did not fully recover until after the currency devaluation of 1994 and structural reforms of the second half of the 1990s. During the downturn, GDP contracted by 5 percent per year on average, and by 1993 per capita income was almost half its 1986 level. Meanwhile, current public spending rose from 11 percent to 19 percent of GDP while investment decreased drastically, falling from 12.4 percent of GDP in 1986 to 3.5 percent in 1993. Investment rates were driven down in part by growth in external debt service payments.

The economic recovery started in 1994 and continued through 2005, thanks to the combined efforts of authorities to implement more prudential economic policies aimed at restoring economic stability, trade and fiscal policies undertaken to conform to Central African Economic and Monetary Community standards, and the nominal 50 percent devaluation of the CFAF in January 1994. However, the structural constraints of domestic demand and supply limited response to the devaluation, and its incentive effects were short-lived.

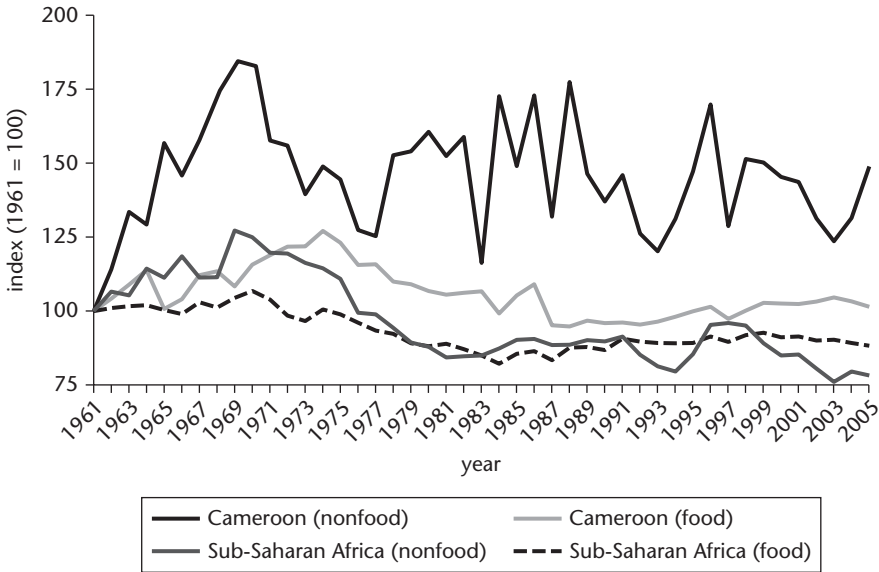
Annual average real GDP growth of about 5 percent between 1995 and 2003 was spurred by the invigorated non-oil private sector, despite problems with the energy sector that inhibited growth in general and that of the manufacturing industry in particular. The spike of inflation that followed the CFAF devaluation gradually subsided during this period, and public finance improved because of prudential budgetary policy and changes in the tax administration. Non-oil government revenue rose by more than 4 percent of GDP, entirely eliminating the budget deficit and generating surpluses starting in 2000. The external debt ratio fell from 77 percent of GDP in 2000 to 44 percent in 2003.

Financial and fiscal recovery after 1995 has been reflected in rising living standards. For example, the poverty index decreased by about 13 percent between 1996 and 2001 (World Bank 2005), thanks largely to recovery of the agricultural sector. Agriculture has registered remarkable growth but still has not brought the country's food production back to the level enjoyed in the early years of independence.

On the trade side, Cameroon was a net exporter of agricultural products before the crisis period. The 1994 devaluation had a significant effect that quickly eroded as imports declined but then rose again in 1996, while exports fell. Increased civil service salaries and real appreciation stimulated the increase in imports. A further boom in imports was recorded with the start of construction on the Chad-Cameroon oil pipeline in 1998, while total exports dropped significantly with enforcement of the a forestry law forbidding the export of whole logs for most kinds of trees. On average, rice and cereal imports increased sharply in the 1990s despite price hikes stemming from the devaluation.

Cameroon has been frequently cited as one of the few countries in Sub-Saharan Africa to have achieved satisfactory agricultural development. But past growth was based on an early and unsustainable expansion of cropped area, with very limited growth of land productivity. The area under cultivation grew sharply in the 1960s and 1970s, particularly for coffee and groundnuts, but growth then slowed markedly, with planting areas expanding only for cotton and sorghum in the 1980s and only for roots and tubers in the 1990s. Despite a significant growth in fertilizer use, growth in yields for the key crops has been relatively low (Bamou and Masters 2007, appendix figures 3 and 4). The net result, measured by per capita production of both food and nonfood crops, is shown in figure 13.1. The numbers suggest that Cameroon has done little better than the average for Sub-Saharan Africa since the late 1960s. These trends in output are influenced by changes in resources, technology, and incomes that shift the domestic supply and demand curves as well as by product pricing and particularly the distortions to agricultural incentives imposed by government policy.

Figure 13.1. Per Capita Output of Food and Nonfood Farm Products, Cameroon and All Sub-Saharan Africa, 1961–2005



Source: Compiled by the authors using FAOSTAT (2006).

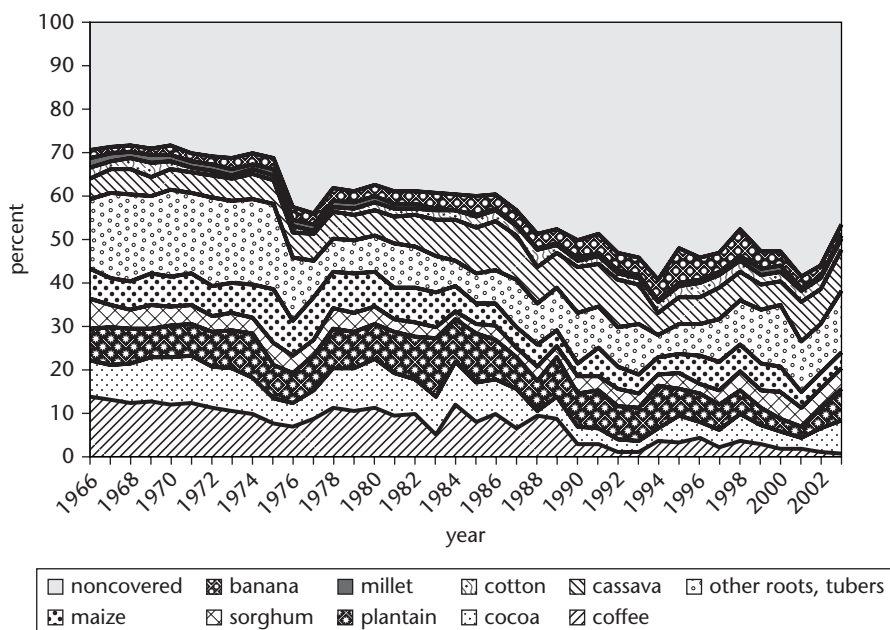
Distortions to Agricultural Incentives

Farm policies in Cameroon have changed frequently since independence. The resulting distortions are measured and analyzed in this section for the entire agricultural sector and for selected agricultural products, using the methodology presented in appendix A of this volume and in detail in Anderson et al. (2008). Our key measure is the nominal rate of assistance, which compares domestic prices with the border-price equivalents that would prevail in the absence of distortions. The NRA is adjusted to take account of other taxes and subsidies.

Estimated distortions are computed for all main agricultural products. We have data for four major exportable products (bananas, cocoa, coffee, and cotton), and six basic food crops (cassava, maize, millet, plantain, sorghum, and other roots and tubers). There is some international trade in the latter group of basic food crops, both formally and informally, but the quantities traded and the distances covered are too small to influence national prices significantly, so in our analysis these crops are considered nontradables.

Three of our commodities (cocoa, coffee, and cotton) are marketed both as primary products and as lightly processed. In these cases, we compute distortions

Figure 13.2. Composition of Farm Production at Distorted Prices, Cameroon, 1966–2003



Source: Compiled by the authors using FAOSTAT (2006).

to incentives for both farm production and off-farm processing. For coffee, the primary product is exportable but the processed item is importable. Cocoa is exportable. For cotton, the primary product is nontradable and only the processed good is exported.

We do not compute distortion estimates for the nontradable basic food crops, because the domestic markets for them are not subject to significant intervention by the government. They play an important role when computing value-weighted averages, though, because they account for the lion's share of primary agricultural production (figure 13.2).

Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in nonagricultural sectors for comparative evaluation. The NRA for nonagricultural tradables is used for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA).

Data sources and assumptions

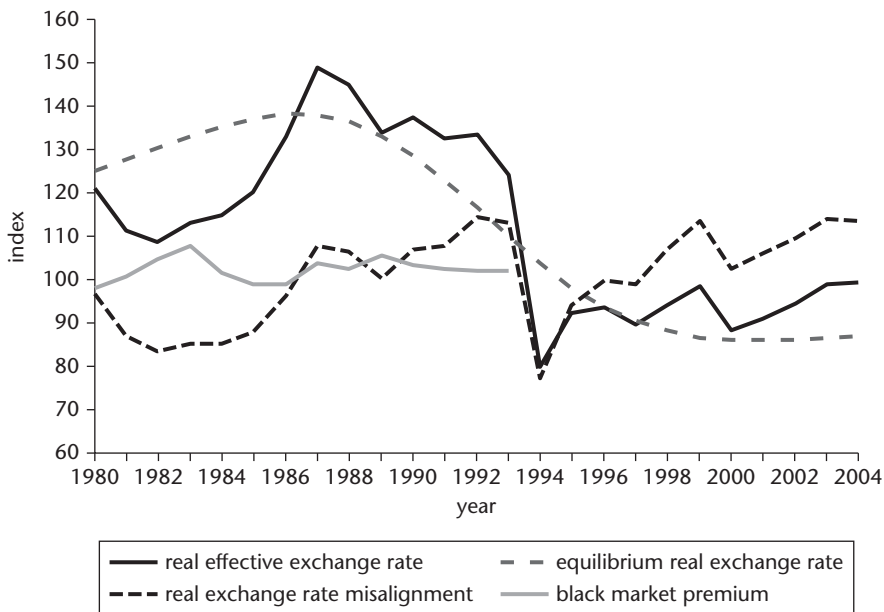
Our analysis begins with the quantity data needed to compute weighted averages of incentive effects, which also use farmgate agricultural prices, border prices, exchange rates, and fiscal data on taxes and subsidies. Production and trade volumes for bananas, cassava, cocoa, coffee, cotton, maize, millet, plantain, sorghum, and other roots and tubers are from FAOSTAT (2006). Prices at the farmgate for most exportable products are from MINAGRI (1980) for 1961 to 1980; MINEFI/DSCN (various years) for 1981 to 2003; and INS (2005) for 2004. Exceptions are detailed here: prices for bananas are derived from the assumptions used by MINFOF (2006).⁴ Wholesale prices for lightly processed cocoa are fob (free on board) prices minus the 17 percent cost margin estimated by CHOCOCAM, the main cocoa-processing enterprise created in 1964. Wholesale prices for coffee are from the *Brulerie Moderne*, created in 1955. Prices for cotton lint and seed cotton are from Baffes (2007), extrapolated back to 1961 from his data for 1970. The wholesale prices of cocoa and coffee are from the National Council of Coffee and Cocoa. The farmgate prices, farm-to-market margins, and wholesale prices of importable and nontradable products are estimated using data from the price-monitoring department of the Cameroon's official statistical agency. Additional data on taxes and subsidies includes government payments to parastatal producers from Varlet (2002), and consumer taxes from *République du Cameroun* (2006 and earlier years). Import and export tariffs are from the subregional common external tariffs established by the Central African Economic and Monetary Community.

Except for cotton, all fob (cif) prices are unit values, calculated from FAOSTAT (2006), as the total value of the country's exports (imports) divided by the volume of exports (imports). Trade prices for cotton are compiled by Baffes (2007) from the Cotlook A Index.

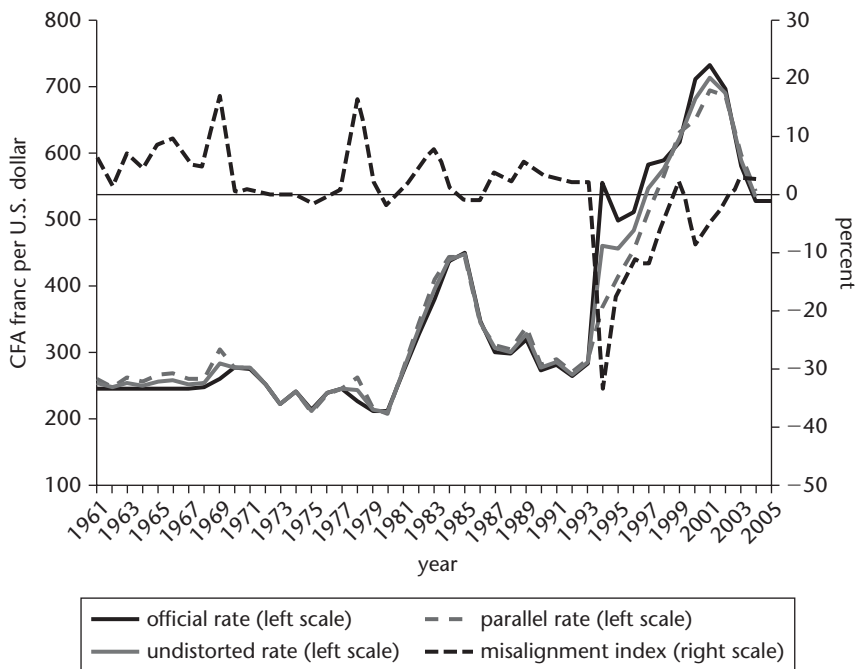
Official exchange rates are from IMF (various years). Distortions to the exchange rate are computed relative to the parallel exchange rate, for which we use black market rates from 1961 to 1993 as reported by Easterly (2006), whose principal source is International Currency Analysis (1993 and earlier years). To complete the series after 1993, we use year-to-year changes based on the changes in real exchange rate misalignment estimated by Elbadawi (2006). Figure 13.3a shows the evolution of the country's real exchange rate and black market premium after 1980s, to show the Dutch disease period and subsequent recovery. During the boom period, all of the exchange rate indexes appreciated significantly. During the economic decline after 1986, the real effective exchange rate depreciated more slowly than the underlying equilibrium rate, leading to increasing misalignment and a sustained black market premium until the devaluation of 1994 sharply lowered the real exchange rate. Economic recovery after the devaluation was associated with renewed real appreciation and a return to significant misalignment relative to Elbadawi's estimate of the underlying equilibrium rate.

Figure 13.3. Foreign Exchange Rates, Cameroon

a. Real exchange rates, 1980–2004



b. Nominal exchange rates, 1961–2005



Source: Compiled by the authors using official exchange rates from IFS 2006, black market parallel rates from Easterly 2006, and real exchange rate indexes from Elbadawi 2006.

Note: The estimates of undistorted exchange rates are based on the methodology of Anderson et al. 2008.

The influence of exchange rate changes on our distortion estimates is shown in figure 13.3b, for the entire 1961–2004 period. On the left axis are nominal rates, in terms of CFAF per U.S. dollar. All movements stem from fluctuations in the dollar vis-à-vis the French franc and then the Euro, except for the jump in 1994. The official rate shows significant overvaluation, with positive misalignment on the right axis, through the 1960s and episodically in the 1970s. Then, as shown in figure 13.3a, there was some overvaluation until the 1994 devaluation, whose effects were then gradually eroded by real appreciation. Following the methodology of Anderson et al. (2008), we use an average between the official rate and the parallel rate as our estimate of the undistorted exchange rate.

Results

The overall picture in agricultural distortions is clearly one of worsening price distortions during the 1960s and 1970s, followed by reform and reversal during the oil boom and ultimately by a period of sustained reforms after 1986.

Table 13.1 presents five-year averages of estimated distortions to farm-level incentives for production of key crops affected by trade policy, along with a value-weighted average of the crops shown. During the 1960s, taxation of key crops was substantial, on the order of 30–50 percent. These rates rose above 50 percent in the late 1970s before declining with reforms and fluctuating in the 1980s and 1990s. They have remained at historically low levels since 2000. The bottom section of the table presents a weighted average for all products, with taxation worsening to a peak of 25 percent in the late 1970s, then settling to near zero after 2000. Dispersion in tax rates among products also declined, to a standard deviation of less than 10 percentage points.

Figure 13.4 provides annual value-weighted composite measures aggregated by trading status for all primary agricultural products. This listing includes not only the exportable primary products shown earlier (bananas, cocoa, coffee, and cotton), but also nontradable primary products (cassava, maize, millet, plantain, sorghum, and cassava plus other roots and tubers). No importable primary products are included in this study. On average over these crops, the burden of taxation facing production of exportables grew from about 15 percent in the early 1960s to a peak of over 50 percent in the late 1970s, before shrinking in the late 1980s and remaining well below 15 percent in most years since then. We find no comparable distortion on nontradables, so the result is a significant antitrade and antiagricultural bias through the 1960s and 1970s but with both kinds of distortion being much less significant over the past two decades.

The covered products account for half or more of the value of agricultural production (at undistorted prices and excluding forestry and fisheries). We

Table 13.1. NRAs for Covered Farm Products, Cameroon, 1961–2004
(percent)

Product indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Exportables ^{a,b}	-22.1	-38.5	-43.7	-56.9	-40.5	-9.1	-14.1	-14.1	-5.7
Banana	-2.4	-4.3	-0.1	-1.5	-1.2	-0.9	3.1	4.5	1.1
Cocoa	-28.6	-47.8	-44.7	-60.3	-37.7	-1.9	-32.7	-34.1	-12.2
Coffee	-31.2	-31.5	-43.3	-56.2	-43.7	-15.0	-15.8	-8.7	-2.0
Cotton	—	—	-43.9	-41.7	-29.3	18.1	-4.6	-14.1	1.4
Nontradables ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Maize	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sorghum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cassava	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other roots and tubers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plantain	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total of covered products ^a	-3.5	-8.3	-11.6	-25.1	-19.7	-5.1	-4.6	-4.5	-1.1
Dispersion of covered products ^b	12.8	17.2	21.0	28.8	20.6	16.7	15.3	12.4	7.1
Percent coverage (at undistorted prices)	70	71	70	61	61	56	47	48	48

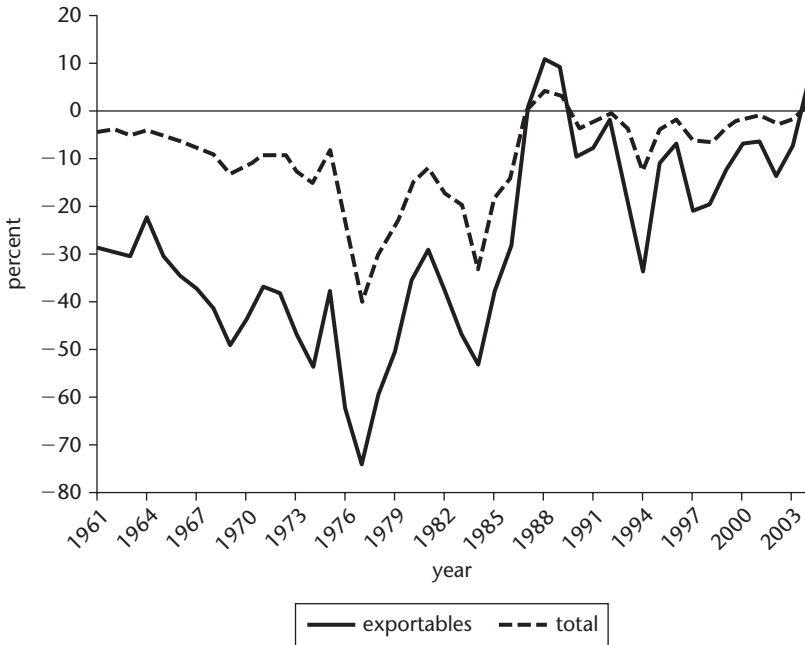
Source: Data compiled by the authors.

Note: — = no data are available.

a. Weighted averages, with weights based on the unassisted value of production.

b. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

Figure 13.4. NRAs for Exportable and All Covered Farm Products, Cameroon, 1961–2005



Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable average because assistance to nontradables and non-product-specific assistance are also included.

guesstimate that the NRA for noncovered farm products is zero, but a portion of them are exportable and so are adversely affected by distortions in the exchange rate. Table 13.2 presents estimated results that account for this effect, showing how the overall total NRA for the agricultural sector is a little less negative than for just covered products (see upper half of table 13.2)

Figure 13.5 and the lower half of table 13.2 capture policy effects on incentives for production of tradables in primary agriculture as opposed to those in the non-farm sector. These effects are summarized in the relative rate of assistance. Distortions have strongly favored nonfarm (including agroprocessing) activities, with an average rate of subsidy above 20 percent for almost all of the 1960s, 1970s, and 1980s, until reforms after 1986 drew protection rates steadily down below their initial 1960s level. Meanwhile, primary agriculture faced worsening average tax rates from the early 1960s to 1977, when reforms were introduced for a brief period and then reversed; not until 1985 did sustained reform begin. The net result was a relative disincentive that worsened from about 25 percent in the early

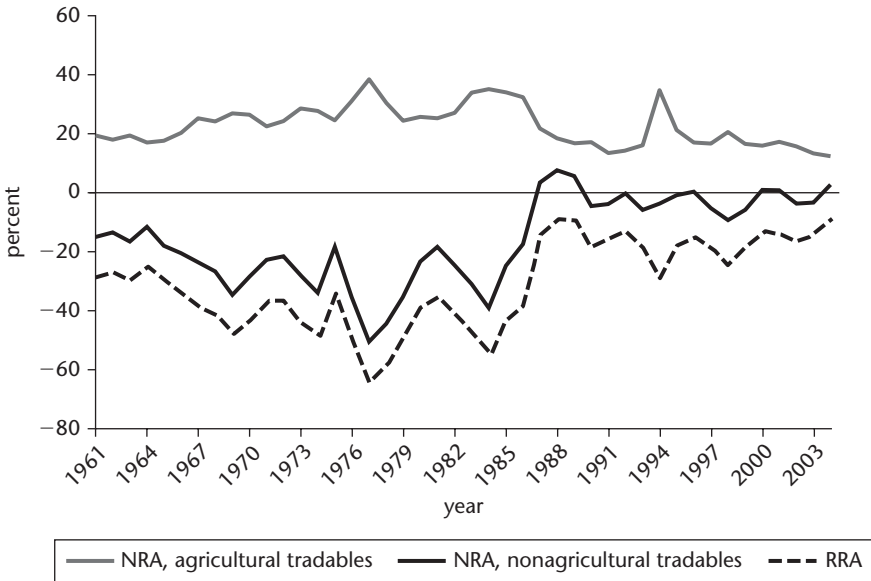
Table 13.2. NRAs for Agriculture Relative to Nonagricultural Industries, Cameroon, 1961–2004
(percent)

Indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
TNRA, covered products	-3.5	-8.3	-11.6	-25.1	-19.7	-5.1	-4.6	-4.5	-1.1
NRA, noncovered products	-0.6	-1.3	0.0	-0.5	-0.4	-0.3	0.9	1.4	0.3
NRA, all agricultural products	-3.3	-6.3	-8.1	-15.1	-12.2	-3.3	-1.5	-1.5	-0.3
Non-product-specific assistance	0.4	0.3	0.6	0.7	0.8	0.9	0.3	0.2	0.2
NRA, total agriculture ^a	-2.3	-6.0	-7.5	-14.4	-11.4	-2.4	-1.1	-1.3	-0.1
NRA, all agricultural tradables	-11.4	-24.7	-27.0	-36.9	-27.3	-5.2	-3.7	-4.2	-0.5
NRA, all nonagricultural tradables	18.3	24.5	25.5	30.0	31.1	21.3	19.9	17.3	11.7
RRA ^b	-22.0	-38.5	-41.9	-51.0	-43.6	-23.1	-18.8	-19.0	-13.4
Memo item, ignoring exchange rate distortions:									
NRA, all agricultural products	-1.9	-5.0	-7.4	-13.9	-10.9	-2.1	-2.1	-2.8	-0.4
RRA ^b	-20.0	-34.6	-41.9	-50.1	-42.6	-21.7	-21.0	-24.2	-14.7

Source: Data compiled by the authors.

Note: TNRA = total NRA.

- a. NRAs including product-specific input subsidies and non-product-specific assistance. Total of assistance to primary factors and intermediate inputs divided by total value of primary agriculture production at undistorted prices (percent).
- b. The RRA is defined as $100 \times [(100 + NRA_{ag}^t) / (100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 13.5. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Cameroon, 1961–2004

Source: Data compiled by the authors.

Note: For a definition of the RRA, see table 13.2, note b.

1960s to an RRA of 64 percent in 1977, before moving toward zero in recent decades. Even in 2000–04, the RRA still was nontrivial at –13 percent, but that was a huge improvement for farmers over the rates before the 1980s.

The policy mix of direct and indirect taxes through fiscal policy, marketing boards, trade barriers, foreign exchange restrictions, and other development policies imposed a significant burden on farmers for the benefit of urban industry, particularly in the 1970s. The exchange rate distortions do not appear to have had a very significant effect on the NRAs and RRA, however (see final two rows of table 13.2). These general results are in line with those of Njinkeu (1996), who concludes that, “the performance of the exporting sectors [in Cameroon], for example agriculture, may be partly explained by the implicit tax resulting from protection of import-substituting sectors.” Reforms in the 1980s and 1990s relieved that earlier burden on farmers and reduced support to processors, with, on balance, some taxation of processors since the 1990s.

Underneath these aggregates are some pronounced differences in distortions facing producers and consumers of particular products. Perhaps most important are the effects on policy across crops in primary production, influencing the

welfare of farmers in different regions and the incentives for them to change cropping patterns. Cameroon's broad pattern of heavy taxation against tree crops was typical of African countries. McMillan and Masters (2003) explain this tendency in terms of the time-consistency of alternative policies: in the absence of commitment mechanisms, governments may have a short-term incentive to set taxes so that farmers earn only the marginal cost of harvesting their tree crops, even if the taxes discourage tree replacement or maintenance investments and thus come at the cost of future productivity. In Cameroon, the government's incentive to tax tree crops could be exacerbated by the relative political influence in general of the forested southern areas as opposed to the drier north of the country. The northern region, in part because it often faced seasonal food insecurity, has benefited from special agricultural policies since independence.

Summarizing our results, the significant increases in the taxation of primary agriculture and the subsidization of nonagriculture from the early 1960s to the late 1970s was successfully reversed during the 1980s. Those reforms are likely to have significantly raised farm incomes and farmer incentives to increase production, relative to a continuation of past policies, accounting for at least some of the upswing in agricultural yields and fertilizer use as well as for the economy-wide growth in per capita incomes.

Prospects for Continued Agricultural Policy Reforms

Through Cameroon's Poverty Reduction and Growth Facility strategy of 2005–08, underpinned by the Heavily Indebted Poor Countries (HIPC) Initiative,⁵ the government of Cameroon once again considers agriculture and rural development to be a key means to raise economic growth rates and further reduce poverty while maintaining macroeconomic stability and debt sustainability. At the same time, movement on the stalled multilateral trade negotiations under the Doha Agenda of the World Trade Organization (WTO), with their embedded market access, export subsidies, and domestic support challenges, could eventually lead to greater liberalization of agricultural trade worldwide. Improving agricultural performance in such a context requires that more attention be given to programs for enhancing agricultural productivity and competitiveness. Such programs should lift supply constraints on the flow of agricultural products to the external market, build complementarities between formal and informal domestic markets, and continue reform of the institutions needed for a more productive agricultural sector. These goals are central to the long-term development of agriculture in Cameroon. Such a development approach depends mainly on improving governance and combating corruption, strengthening legal security for investment in

general and agricultural investment in particular, and raising the quantity and quality of infrastructures and key public services such as research and education. Government actions in these areas will then make it more worthwhile for enterprises to invest in productive techniques and to diversify production in a sustainable manner.

The negative effect of corruption on the development of all sectors, including agriculture, is very well known. According to Transparency International, Cameroon topped the list of the most corrupt countries in the world in 1998 and 1999. The country has done a bit better in recent years. However, it still holds a dishonorable place in this shameful hit parade. Corruption is still endemic in the country, and reducing corruption remains a very high priority. The government has formed an ad hoc committee to coordinate the work of observers and groups carrying out anticorruption work in every ministry and public service.

The development of basic infrastructure, notably inland and cross-border road infrastructure, is crucial for the enhancement of agricultural production and the promotion of agricultural exports. The development of the inland infrastructure is expected to determine the competitiveness of subsistence agriculture, an important source of input for the agroindustrial sector, while the cross-border infrastructure will enhance the subregional agricultural competitiveness, which constitutes a platform for Cameroon's involvement in the global agricultural market.

Improvements in agricultural productivity are needed to raise the payoffs from new investment and thereby induce farmers to update their production techniques. A number of public goods are involved, calling for government intervention in areas such as quality standards, education and training, and access to information and communication technologies. These public investments are important not only for the productivity of existing activities but also for the emergence of new ones. Currently, exports in Cameroon are limited to only a few primary products, as shown by the Export Diversification Index of UNCTAD (2001) and by Bonaglia and Fukasaku (2003).⁶ Improved incentives as well as appropriate public investments will lead to new exports, but toward which agricultural products should export promotion be directed? Bamou and Bamou (1999) give an insight to this question by identifying 19 non-oil, nontraditional competitive and profitable exports, of which 4 are primary agriculture. Growth in these sectors has been stifled by prices below world levels, and their emergence in the future could be crucial to help agriculture play the historical role it has played elsewhere throughout the world in inducing food security, increasing the savings rate, and funding an emerging manufacturing sector.

The extent to which the agricultural sector is directly affected by developments in world markets for agricultural products sheds light on a country's interests in future agricultural trade negotiations. Given that those negotiations could

provide an opportunity to examine key issues with important implications for developing countries' agricultural sectors in general and for that of Cameroon in particular, Cameroon will need to focus its negotiating positions on preference erosion, tariff escalation and tariff peaks, tariff rate quotas, export subsidies, domestic subsidies, capacity building, state trading, special and differential treatment, and consideration of multifunctional character of agriculture, especially as it relates to food security.

To improve market access for Cameroon's agricultural products, the negotiations should strive to remove remaining nontariff barriers and reduce tariff peaks and tariff escalation in developed-country markets. The country could offer to reduce the level of its agricultural tariff binding and set it closer to the current applied tariff level by locking in at the current level of commitment within the Central African Economic and Monetary Community. Further liberalization of nonagricultural tariffs could also reduce the bias against agricultural exports. This would improve policy predictability and encourage investment and associated spillover effects on efficiency and market access.

Overall, implementation of the Uruguay Round agreement on domestic support to agriculture increased imbalances in the legitimate use of trade- and incentive-distorting measures. The agreement legalized the use of these measures by developed countries while developing countries were curtailing their use, and it failed to properly define the nontrade concerns that should be taken into account in implementing them (Shirotori 2000). Cameroon could perhaps eventually request reform of each of these dimensions, so that there are new incentives for deeper liberalization in the input sectors and for enhanced reliance on market mechanisms to promote crop development.

Notes

1. To link the important cocoa economy of South-Central Cameroon to the coast, the railway was extended from Douala to Yaoundé and from Otélé to Mbalmayo.

2. The second plan had recommended the expansion of the estate sector (either privately or publicly owned), rural settlement projects to move the population from densely populated to sparsely populated areas, specialized crop development corporations charged with organizing and supervising the production of specific crops grown by small farmers, and integrated rural development projects stimulating production as well as providing social services.

3. The World Bank participated in funding the Investment Fund for Agricultural and Community Micro-Projects, which had 160 branches and 31,000 participants. The project funded 3,000 projects for a total of CFAF 2 million during the period 1989–98. Canada and France provided support for the Fund for Rural Savings and Self-Managed Credits project.

4. Because enterprises were exporting directly, MINFOF (2006) estimated the farmgate prices as the difference between the wholesale prices for primary products and the cost of transportation, storage, and other services (the markup on farmgate prices). The wholesale prices for primary products are equal to fob prices at local currency.

5. On May 1, 2006, Cameroon reached its completion point under the Enhanced Heavily Indebted Poor Countries (HIPC) Initiative, becoming the 19th country to reach that point. Debt relief to Cameroon under HIPC is expected to be approximately \$1.3 billion in 1999 net present value terms, equivalent to a 27 percent net present value reduction of Cameroon's debt after traditional debt relief. This relief will reduce Cameroon's future debt service payments by about \$4.9 billion in nominal terms. See IMF press release 06/85 dated September 7, 2006. <http://www.imf.org/external/np/sec/pr/2006/pr0685.htm>.

6. A higher value of the Export Diversification Index (EDI) and primary commodities' share of total exports (PCS) indicates a greater degree of export concentration. UNCTAD (2001) shows that in 2001, Cameroon was the most concentrated country in its trade, with EDI = 0.90, even compared with some poorer countries such as Senegal (EDI = 0.77) or Mozambique (EDI = 0.83). In like manner, Bonaglia and Fukasaku (2003) show that in 2000, despite the slight decrease of the PCS of Cameroon (from 0.99 between 1966 and 1970 to 0.97 between 1996 and 2000), it was still higher compared with that of other middle-income countries (0.86 for Botswana and 0.88 for Ghana and Kenya between 1996 and 2000).

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CÔTE D'IVOIRE

*Philip Abbott**

After independence in 1960, the economy of Côte d'Ivoire was heralded as one of the success stories of Sub-Saharan Africa. Gross domestic product (GDP) grew at an annual average of 8.1 percent from 1960 to 1979, as per capita GDP increased in real terms from \$595 to \$1,114.¹ This economic boom was led by increasing agricultural exports, principally cocoa and coffee. In 1961, these two exports equaled \$112 million, or 51 percent of total exports, with agricultural exports accounting for 61 percent of total exports. By the late 1970s, cocoa and coffee exports amounted to \$1.5 billion, and were then 53 percent of total exports, with agricultural exports still accounting for 61 percent of total exports (FAOSTAT 2006; World Bank 2006b). Côte d'Ivoire has emerged as the world's largest cocoa exporter, now accounting for as much as 40 percent of world cocoa trade. The country was also Africa's largest coffee exporter during the 1960s and 1970s, although by 2004 coffee exports had fallen to only 4 percent of agricultural exports, while cocoa had increased to more than 70 percent; Total agricultural exports still account for 43 percent of total merchandise exports.

The agriculture-based economic performance of Côte d'Ivoire was stronger than any found elsewhere in Africa, and several economists and political scientists have sought to explain the unique features of agricultural policy that gave rise to it (Boone 1995; Hecht 1983; Widner 1993; Woods 2003, 2004). Those studies generally focus on policy for the cocoa and coffee sectors. This study shares that focus but also considers another agricultural export success, cotton, and Côte d'Ivoire's most important agricultural import, rice. Also examined briefly are wheat, which

* The author is grateful to Jean Luc Agkpo, BNEDT, Abidjan, Côte d'Ivoire, and to Marianne Kurzweil, Ernesto Valenzuela, and John Baffes at the World Bank for input and assistance in collecting national data and to Kym Anderson and Will Masters for helpful comments. Detailed data and estimates of distortions reported in this chapter can be found in Abbott (2007).

is imported but not produced in Côte d'Ivoire, and coarse grains, roots, and tubers, which are traded only on a small scale, mainly with neighboring countries rather than the broader international market.

Despite Côte d'Ivoire's relative success, like most developing countries it engaged in structural adjustment reforms beginning in the early 1980s as economic recession set in, and export revenues failed to keep pace with imports. Côte d'Ivoire is part of the West African currency union, sharing its currency, the CFA franc (CFAF), with neighboring French West African countries and receiving support from the French central bank. Devaluation was (politically) hard to implement and did not occur until 1994, when the CFA franc was devalued by 50 percent. Agricultural policy was managed by parastatal monopolies, such as CAISTAB (*Caisse de stabilisation*) in the cases of cocoa and coffee and the CIDT (*Compagnie Ivoirienne pour le développement des fibres textiles*) for cotton, using institutional frameworks derived from French colonial heritage. Privatization of those parastatals was an objective of international donors but was slow in coming and sporadic in Côte d'Ivoire, where it was resisted by the government. CAISTAB continued to regulate cocoa and coffee trade until 2000, and the government's majority interest in cotton companies created from the CIDT was not divested until 2002 (IMF 2002). Trade liberalization, a part of the structural adjustment program, was implemented in fits and starts, with periods when tariffs were reduced, followed by periods when they rose again. Quantitative restrictions have accompanied parastatal management of agricultural trade and may still remain in place for rice through "voluntary" administered prices (OECD 2006).

Côte d'Ivoire's agricultural economy has focused on small-holder farming and export crops. Those farmers and their exports were heavily taxed. Despite structural adjustment reforms, which included the reduction of agricultural export taxes as one of the goals, taxation of cocoa and coffee exports (especially cocoa) remains a hallmark of Ivorian policy. Those taxes were reduced briefly around the time CAISTAB was privatized but were subsequently raised, and export tax revenue in 2003 amounted to nearly a quarter of government revenue. Import tariff revenue is also important, at 30 percent of government revenue in 2003 (World Bank 2006b).

Policy has usually discouraged food crop production, against the wishes of farmers. Rice and wheat are the predominant cereal imports, with coarse grains, like roots and tubers, behaving like nontradables. Rice imports surged during the commodity boom of the late 1970s, were generally flat during the recession until 1994 (apart from a brief surge in the mid-1980s), and increased again after 1994. The mid-1980s import surge gave rise to a policy focus on self-sufficiency, which briefly slowed but never eliminated imports. Wheat imports emerged in the late 1970s as well and have also increased since 1994.

The recent need for tax revenue from exports derives from political events that have also negatively affected economic performance. While the devaluation in 1994 initially led to a resurgence in economic growth, a coup d'état in 1999 and continuing civil conflict have hampered the economy; and from 2002 until 2007 conflict divided the country, with rebel troops holding the northern part of the country. Cocoa and coffee are grown in the south, so the effects of the civil war have been seen mostly in the resumption of export taxes and increased trader margins on these key exports. Crops predominantly grown in the north, such as cotton and maize, have been more severely affected, and smuggling to neighboring countries has affected both management of the cotton sector, another successful agricultural export at one time, as well as collection of data on conditions in the Ivorian agricultural economy. The need for rice and wheat imports must result in part because they are mostly produced and consumed in the north and not delivered to the urban areas of the south where there is a need for food. In its assessment of the outlook for the Ivorian economy more generally, the Organisation for Economic Co-operations Development (OECD 2006) cited resolution of the civil conflict as the key to future economic performance.

The mystery of Côte d'Ivoire's agricultural policy and economic performance is the continuing success of the cocoa sector despite heavy taxation. Hecht (1983, p. 26) wrote, "the government has consistently followed a set of policies designed to encourage expansion of cocoa and coffee production, while at the same time taxing small-holders heavily for capital accumulation and investment elsewhere in the economy. Other countries . . . have also tried to finance public expenditure in a similar fashion, but have ended up by either crippling or retarding this sector. The Ivory Coast, on the other hand, has successfully nurtured this golden goose, and exploited its precious eggs—without killing the animal." This quote remains remarkably relevant. Cocoa export volume grew steadily since 1960, with a plateau from 1987 until 1994, and another plateau after 1999. Throughout this period there were never sustained increases in farmgate prices. Attempts to estimate supply response for cocoa are plagued by data showing increases in production even as prices fell, particularly in international markets (Maizels, Bacon, and Mavrotas 1997). CAISTAB stabilized pricing (somewhat), so farmers did not feel the full effect of drops in international commodity prices, did not see nominal price declines, and, because of currency stability, did not experience the erratic pricing seen in some neighboring cocoa-exporting countries, such as Ghana (Brooks, Croppenstedt, and Aggrey-Fynn 2007). Analysts attribute increasing production in the face of low and sometimes falling real prices to liberal immigration and land tenure policies (Boone 1995; Widner 1993; Woods 2003, 2004). This theory goes a long way toward explaining growth until 1994, which resulted largely from area expansion, but it cannot account for the increasing yields and

constant area planted since then, as well as the change since 1993 in attitudes and policy toward immigrants that lay behind the civil conflict of the early 2000s.

Measures of distortions to agricultural incentives reflect this continuing taxation of agricultural exports and in the case of rice, administered pricing. While structural adjustment reforms in Côte d'Ivoire have aimed at, and at times succeeded in, liberalizing trade, the civil conflict since 1999 has driven the government's desire for tax revenue from agriculture and continued limitations on imports. Stabilization in the face of volatile international prices, effects of the recent civil conflict, and earlier structural adjustment reforms earlier, are all evident in the extent of taxation of export agriculture in Côte d'Ivoire.

The remainder of the chapter provides more detail on Côte d'Ivoire's economic performance, followed by an exploration of the role of agriculture in the economy, and particularly in exports. A brief historical overview of agricultural policy shows the colonial roots of policy institutions and the importance of structural adjustment reforms. Policies and performance for the four key agricultural sectors—cocoa, coffee, cotton, and cereals—are then examined, and data on prices and performance are used to quantify the extent of distortions to agricultural incentives in Côte d'Ivoire. The concluding section summarizes what has been learned about both the extent of distortions and the political economy factors determining those distortions.

Economic and Trade Performance

In 2005, real GDP per capita in Côte d'Ivoire stood at \$563 (in constant 2000 U.S. dollars). This low income level reflected an inability to sustain the economic success that prevailed during the first 20 years after independence, from 1960 to 1979, and was also attributable to the costs of continuing civil conflict.² Annual GDP growth averaged 8.1 percent from 1960 until 1979 and reached nearly 10 percent during the commodity boom from 1975 to 1979, before declining to, and remaining at, a level below that found in 1960. A recession driven by low export earnings and an overextended public debt burden ensued from 1979 and led to persistent negative economic growth until 1994. The devaluation of the CFA franc in 1994 briefly spurred economic growth, which averaged 6.3 percent annually until 1999, but stagnation returned with the civil conflict, and annual economic growth was negative in 1999–2004, averaging –0.55 percent.

Trade, especially agricultural trade, has been important to the evolution of the Ivorian economy. In 2005, exports represented 50 percent of GDP, and imports equaled 40 percent of GDP. At peak GDP in 1978, exports and imports were each already 37 percent of GDP. Just before the devaluation of 1994, exports had declined to 29 percent of GDP, whereas imports were only 26 percent of GDP at

the overvalued exchange rate (World Bank 2006b). Immediately after the devaluation, exports rose to 40 percent of GDP, while imports averaged about one-third of GDP.

Trade taxes have been an important source of revenue for the government. Export taxes accounted for 24 percent of revenue in 2003, while customs duties contributed 30 percent of revenue. Export taxes were only 12 percent of revenue in 1998, a consequence of structural adjustment reforms, while customs duties have remained steady at about one-third of revenue. Since the completion of the Uruguay Round under the General Agreement on Tariffs and Trade, Côte d'Ivoire has maintained a relatively uniform tariff schedule, with a typical ad valorem rate of 20 percent (with some exceptions). A value added tax (VAT), now at 18 percent, also applies to imports as well as to domestically produced goods that are locally consumed (World Bank 2006a).

Trade and economic growth have both been influenced by exchange rate policy. Côte d'Ivoire's currency is the West African CFA franc, which is also used in Benin, Burkina Faso, Mali, Niger, Senegal, and Togo. The *Banque Centrale des Etats de l'Afrique de l'Ouest* was created in 1946 by France to support its colonies and remained in force after independence. This currency continued to be supported and managed by the French central bank, which also attempted to impose monetary and fiscal disciplines on the governments of participating countries (van de Walle 1991). When borrowing evaded those disciplines and the currency became overvalued, the French central bank was required to inject considerable capital into the West African central bank and thereby into the economy of Côte d'Ivoire. In the early period, from 1960 to 1979, this system created a stable foreign currency, avoiding hyperinflation or large black market premiums, in contrast to many experiences elsewhere in Africa.

Easterly (2006) has calculated a parallel (black market) exchange rate for the CFA franc, which shows only very small black market premiums from 1960 to 1970 and again in the late 1970s to early 1980s, and no premiums in other years. Given the capital inflows from France and the extent of convertibility of this currency, it is not surprising that black market premiums were never large. But the real exchange rate (REER) estimated by the International Monetary Fund, based on differential inflation, shows an overvaluation during the recession of the 1980s and the need for the devaluation of 1994, which brought this measure of the real exchange rate and the official rate back into alignment.³ This index suggests overvaluation of 54 percent in 1980, and of more than 40 percent from 1987 until the devaluation in 1994. The Fund's REER is used as this study's proxy for a parallel market exchange rate: as discussed later, it shows a bias against agricultural exports in favor of food imports only during this protracted recession.

Agriculture's Role in the Economy

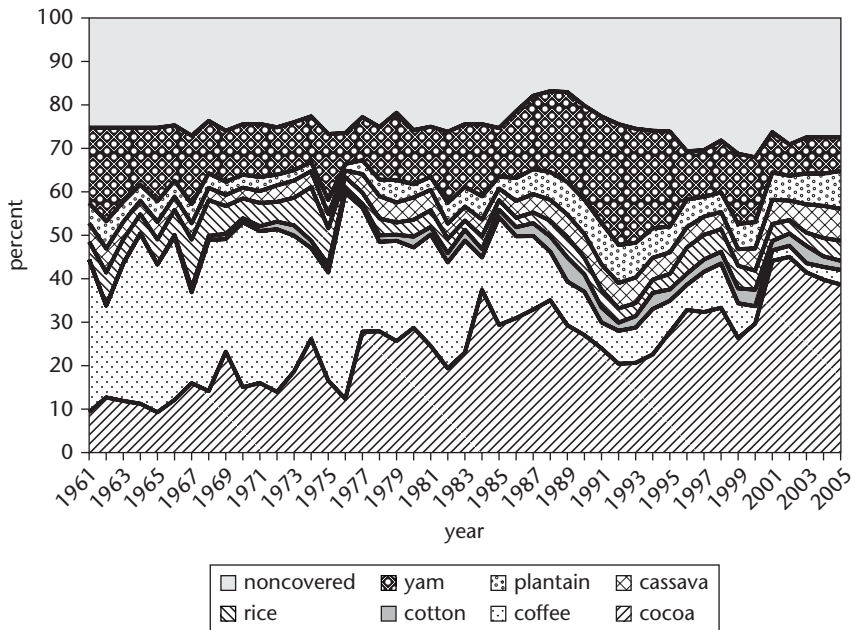
Côte d'Ivoire has remained a largely rural society: 82 percent of the population was rural in 1960, 64 percent remained rural in 1979, and still 55 percent in 2005 (World Bank 2006b). As of 2003, value added from agriculture contributed nearly one-quarter of GDP, compared with nearly half of GDP in 1960. At \$1,048 per worker, agricultural value added was 2.7 times greater than that found elsewhere in Sub-Saharan Africa (FAO 2003). These data reflect some industrialization and urbanization, but as the trade statistics demonstrate, agricultural exports remain critically important to this economy. Although coffee has declined in importance, cocoa remains Côte d'Ivoire's key export, and a number of other tropical products (such as bananas and pineapples) and cotton are also important exports as well. Nevertheless, in many respects, Côte d'Ivoire is a classic example of a developing economy heavily dependent on a single commodity export. Cognizant of this fact, the government has on several occasions pursued diversification strategies but to little effect.

Côte d'Ivoire's 32 million hectares can be divided into two distinct parts—the tropical rain forests of the south and the savannahs of the north. Cocoa and coffee as well as tropical fruits and vegetables are grown in the southern region, while cotton, maize, and cassava are grown in the north. Rice is mostly grown in the north, although some is grown in the forest areas of the southwest. Only 7 percent of the rice area is irrigated, and upland varieties make up most of the rice grown (WARDA 2004; FAO 2003). Forests accounted for 31 percent of area in 1995 but only 22 percent in 2002, reflecting serious deforestation. Traditional cocoa planting techniques coexist with rain forest, but modern techniques using fertilizer eliminate the forest cover. This deforestation reflects the limitations on expanding the area planted to cocoa and coffee and on shifting to new techniques in some areas (Ahmed, Kazianga, and Sanders 2005). Land nevertheless remains relatively abundant: cultivable land represents 75 percent of total area, of which actually cultivated land is only 30 percent. Only 4 percent of area in Côte d'Ivoire is devoted to cereal production, while pasture accounts for more than 40 percent of area (FAO 2003). The product composition of agricultural output is summarized in figure 14.1, illustrating the importance not only of the export crops (especially cocoa and coffee) but also of nontraded food staples (especially cassava and yams).

Small-scale farmers, who on average own four hectares, are the rule for most agricultural activities, including cocoa, coffee, and cotton production. More than 500,000 small-holders plant cocoa in Côte d'Ivoire. Large plantations are found mainly for bananas, rubber, palm oil, and pineapple and account for only a small share of agricultural production (FAO 2003).

While cocoa and coffee, including processed product exports, contributed on average more than 70 percent of agricultural exports during the late 1990s, other

Figure 14.1. Share of Agricultural Production at Undistorted Domestic Prices, Côte d'Ivoire, 1961–2005



Source: Data compiled by the author.

agricultural exports matter as well. Cotton averaged nearly 7 percent of agricultural exports, and other important exports included pineapple (2.1 percent), bananas (3.0 percent), palm oil (2.7 percent), rubber (3.5 percent) and logs (0.6 percent) (FAOSTAT 2006). Canned fish also accounted for nearly 6 percent of exports. Shares of food imports in the late 1990s were 20 percent for rice, 29 percent for fish, 8.8 percent for dairy products, 9.5 percent for wheat, 3.7 percent for sugar, and 3.8 percent for tobacco (FAO 2003).

Because Côte d'Ivoire is dependent on commodity exports, performance is strongly determined by international prices, which have been quite volatile since 1960.⁴ These nominal prices show a pattern of correlation between international commodity prices, and key periods when high and low prices have occurred. High prices prevailed for all these commodities during the mid- to late 1970s, with declines particularly evident for cocoa and coffee starting in 1979. A second common peak occurs around 1995, and low prices for all these commodities are found around 2000. The magnitude of these variations is also striking. The export price for a metric ton of cocoa reached nearly \$3,800 before the decline (in 1977), fell below \$1,000 in 2000, increased because of civil conflict in 2002,⁵ and was only

about \$1,500 in 2007. The price for a metric ton of coffee reached nearly \$5,000 in 1976 but then fell to less than \$1,000 in 1991 and from 2000 to 2003. By comparison, rice, maize, and cotton prices seem less volatile, but these prices also reveal considerable variability. There are some commodity-specific trends, but strong correlation among all the international commodity prices. Côte d'Ivoire's export revenues have been dependent on some of the most volatile commodity prices, and these international price variations are much larger than domestic distortions. Despite the government's efforts to stabilize prices, domestic prices of key exports have seen some effects from these trends. This is more evident in recent years because structural adjustment reforms have eliminated mechanisms to stabilize domestic prices, but private traders have absorbed some price instability.

History of Agricultural Policy Incentives, Interventions, and Reforms

Various analysts have offered different period delineations of Côte d'Ivoire's economic and political events, depending on their objectives. In particular, the recession and structural adjustment period has been divided by some, to account for ups and downs in liberalization efforts and the end of the presidency of Felix Houphouët-Boigny. Political events have influenced the evolution of agricultural policy and helped to define these periods. For the purposes of this chapter's focus on distortions to agricultural incentives, it will be sufficient to follow the divisions used to this point, namely, 1961–1979 (initial economic success after independence), 1980–1993 (recession and structural adjustment), 1994–1998 (postdevaluation reforms and resurgence), and 1999–2005 (civil conflict and economic decline). For background, however, this chapter begins with the period before independence.

Colonial heritage

The institutional development behind agricultural policy, and indeed all policy evolution, was conditioned by Côte d'Ivoire's experience as a French colony. Côte d'Ivoire officially became a French colony in 1893, became an autonomous republic within the French community in 1958, and achieved full independence in August 1960. As a colony, it was a source of agricultural exports to Europe, with cocoa and coffee plantations being established alongside small-holder farms beginning in the 1920s (FAO 2003). Cotton production was also developed from about the same time. According to Bassett (1988, p. 269), “the first period (1910–22) saw the establishment of the conditions for commodity production through the development of transportation networks, the activities of merchant houses and the imposition of export-oriented cotton production.”

Establishment of the infrastructure and institutional structures during this period characterized Ivorian agriculture and policy afterward. It is still the case that transportation costs within Côte d'Ivoire are lower than elsewhere in Africa, largely because of the roads and railroad built by the French. And the cotton parastatal, the CIDT, was fashioned after the French public company *Compagnie Française pour le Développement des Fibres Textiles*. Parastatals dominated agricultural export policy institutions until well after the 1994 devaluation and privatization demands of structural adjustment reforms. Even though the colonial era included periods of forced labor and coercion and French settlers had established plantations for cocoa and coffee in the south that required significant, sometimes forced, labor from other areas of Côte d'Ivoire, the structure of small-holder agriculture now found in cocoa, coffee, and cotton had been established by the time of independence in 1960 (Bassett 1988). The focus of policy on export crops at the expense of food production also emanated from the colonial period.

Success following independence, 1961–79

From independence until 1993, Houphouët-Boigny served as president, and the first multiparty elections did not occur until 1990. Several analysts (Boone 1995; Hecht 1983; Widner 1993; Woods 2003, 2004) debate the importance of having a president with rural roots who continued to own agricultural assets, but it is clear that Houphouët-Boigny pursued policies to support Ivorian export agriculture, while managing to extract significant export taxes from the sector. Hecht (1983) in particular notes the success of this regime, contrasting it with other African economies where agricultural taxation ultimately harmed export revenue generation.

While some authors claim that the regime was responsible for high farmgate prices, those prices as a share of international prices for cocoa, coffee, and cotton were only somewhat higher, at 40–55 percent, during the 1960s and 1970s than they were during the recession period of the 1980s or in the early 2000s. International price levels probably played a bigger role in determining these shares than did domestic or trade policy. Administered prices for cocoa never fell in nominal terms, and the stability of the CFA franc meant that hyperinflation never eroded the value of those administered prices.

The growth in exports, particularly of cocoa, is attributed to available rain forest and supportive immigration and land tenure policies that allowed immigrants from elsewhere in West Africa not only to provide labor but also to “own” their own farms with the knowledge that they could maintain control of their land as long as they were productive. Ruf (1995) and Lopéz (1998) argue that this

regime exploited a forest rent that led not only to area expansion as the engine of growth but also to pioneering new areas rather than replanting older trees to maintain yields. The opportunities offered to immigrants on small-holder cocoa farms, particularly relative to returns to subsistence crops in their home countries, therefore played a key role in explaining the country's agricultural success. Bassett (1998) also notes the importance of the technical package for cotton, which gave rise to its initial success in the mid-1960s, and which came from the French through the CIDT. Several authors note that during this period, parastatals not only administered markets but also provided extension and research services to farmers as well as organizing input supplies.

French and other African colonial agricultural institutions are often contrasted, especially for cocoa. Boone (1995, p. 447) in particular describes Ivorian parastatal management as "relatively laissez faire." Although the parastatal (CAISTAB) set administered prices for cocoa and coffee and provided public goods (extension services, inputs), private agents were allowed to conduct trade, and the state intervened little in the production process itself. Ivorian management of cocoa and coffee can be contrasted not only with the approaches in Ghana and other important cocoa-producing countries, where state agents bought and sold all cocoa and influenced production techniques, but also with its own management of cotton by the CIDT, which is similar to public management found elsewhere. This greater state intervention was probably necessitated by the agronomy of cotton, which requires much more intensive use of inputs and more sophisticated technology than does traditional cocoa production. The need for fewer inputs permitted the laissez-faire approach to cocoa, which may have become less successful as access to new rainforest diminished and more intensive practices as well as methods to avoid disease became necessary.

Recession and structural adjustment, 1980–93

During the structural adjustment era, the country experienced significant variation in the extent of protection and in liberalization, driven in part by variations in export earnings (Kouassy, Pegatienan, and Ngaladjo 2004). Tariffs reached an average of 32 percent by 1989, fell to 24 percent by 1993, and following the 1994 devaluation were reduced to an average of 20 percent, similar to current levels (FAO 2003). Despite these and other trade and macroeconomic reforms, significant changes to agricultural policy were a long time in coming. Parastatals persisted despite international donors' insistence on privatization, until 1995 in the case of rice, 1998 (really 2002) in the case of cotton,⁶ and 2000 in the cases of cocoa and coffee. Effective protection had significantly increased in the early 1980s, so in 1984 tariff reforms were instituted to foster industrialization

(FAO 2003). Variations in world prices, especially for cocoa and coffee, and financial difficulties following from the liberalization, led to a reversal of policies in the late 1980s and then to a return to liberalization in the early 1990s, which was consolidated by the devaluation of 1994 (Kouassy, Pegatienan, and Ngaladjo 2004). Parastatals and the government implemented quantitative restrictions on trade during this period as well.

Rice self-sufficiency was maintained through a parastatal (*Caisse générale de péréquation des prix*) created during this period, which managed the market, provided extension services, and invested in irrigation. Rice prices even exceeded border prices by more than 50 percent for a few years in the mid-1980s (when world prices were very low). This, and quantitative restrictions on wheat imports, were the only significant deviations in policy focus away from export crops. Investments in sectors to diversify exports from cocoa and coffee had been made in earlier periods, including in the late 1970s, and were made in later periods, as stabilization revenues for cocoa and coffee were instead spent on public investments in other sectors. Few of these diversification projects succeeded, however.

The debate over CFA franc devaluation is also characteristic of the structural adjustment reform era. Evidence of overvaluation as high as 50 percent (based on the REER) can be seen as early as 1980, but nothing was done until the 1994 devaluation. French intervention and the political problems of devaluing a currency shared by several countries delayed the devaluation, which was also resisted by Houphouët-Boigny until his death in 1993 (van de Walle 1991). But public debt accumulated to crisis levels, so the devaluation was undertaken as an economic necessity.

Variations in cocoa and coffee prices and in export revenue lay behind the weakening international financial positions in West Africa before devaluation. CAISTAB shielded Ivorian cocoa farmers from much of the international price variation, with remarkably stable nominal, domestic cocoa prices over this period of enormous change in international prices. Farmgate coffee prices showed more variability, though hardly all of it was attributable to international price variability. From 1979 to 1999, the standard deviation of domestic cocoa prices was 37 percent of that for border prices, with both measured in CFA francs. For coffee, the standard deviation of the domestic price was 39 percent of the border price in CFA francs and 167 percent of the standard deviation in cocoa domestic prices. The 1994 devaluation was also more evident in nominal coffee, cereals, and cotton prices than in cocoa prices. Administered prices for cocoa prevented operation of the mechanism by which devaluation could succeed. The surprising result is that cocoa remained the dominant crop and continued to expand even when land availability restrictions began to bind.

Devaluation and privatization, 1994–98

More serious efforts to liberalize Ivorian trade and to privatize Ivorian agricultural markets followed the 1994 devaluation, if slowly. Privatization of the state-run economy, as noted above, was an important part of the reform package and was eventually implemented for these crops, although gradually and with resistance from the government and the sector. Tariffs were also reduced following the devaluation. By 1995, tariffs averaged 24 percent and the VAT averaged 17 percent. These were somewhat lower for agricultural products (at 17 and 9.5 percent, respectively) but about the same for food products (at 25 and 14 percent) (WTO 1995). The devaluation succeeded in stimulating the Ivorian economy, which grew rapidly again after 1994 until 1999, when the civil conflict began. The efforts to privatize continued from the mid-1990s until 2002, when the conflict became a full-scale civil war.

The devaluation period also marked the beginning of change in the immigration policy that had fueled growth in cocoa production. Houphouët-Boigny's successor ran on a liberal immigration campaign but subsequently introduced the concept of "Ivoirité," when limitations on expansion of cocoa cultivation and less economic success made it more difficult for Ivorians to share the benefits of agricultural production with immigrants. A military coup d'état in 1999, fueled in part by the immigration controversy, brought an end to the postdevaluation period, and continuing civil conflict has since hampered economic performance and particularly agriculture in the north of the country. Remarkably, cocoa output has remained relatively stable over this period.

Civil conflict, 1999–2005

Elections were reestablished in 2000, but another failed coup d'état occurred in 2002, and then a rebel uprising divided the country between the north and south. Immigration and eligibility for the presidency were key issues in the dispute, and in 2004 there was a mass exodus of workers from the south (OECD 2006). In 2007, after the period studied here, a peace agreement was reached, and elections, which had been postponed for some years were tentatively scheduled to be held in late 2008.

The political division between north and south affected agricultural subsectors differently. Cocoa and coffee are produced in the rain forests of the south, and exports for cocoa have remained steady despite the conflict. But cotton and most cereals are grown in the north, in areas held by rebels. Most cotton production is apparently sold and ginned in neighboring Mali and Burkina Faso (OT Africa Line 2006), so the Ivorian cotton companies have been facing difficult financial times. They have also had difficulty obtaining credit in part because of the conflict

and in part because of structural adjustment reforms. Most rice is also produced in the north, so imports of rice to feed people in the urban areas of the south increased markedly in the early 2000s. “Voluntary administered prices” for rice in urban areas were established, but these appear to have helped traders more than farmers, raising wholesale-to-retail margins (OECD 2006; Oryza 2004).

Agricultural Policies, Output, and Trade

In this section, pricing and performance data are examined for the four key sectors that are the focus of this study—cocoa, coffee, cotton, and cereals. In addition, critical issues relevant to each sector are identified, and events in that sector are related to the policy evolution.

Cocoa

Cocoa remains Côte d'Ivoire's leading agricultural export, accounting for 40 percent of export revenue in 2002, 37 percent in 2003, and 30 percent in 2004, despite continued heavy taxation and low farmgate prices relative to border prices. Export volume was higher in 2004 than in the two previous years, so changes in world prices explain these revenue variations. Exports for Côte d'Ivoire were 41 percent of world cocoa trade in 2001 and 35 percent in 2003, making it the world's largest exporter and giving it the motivation to maintain its export taxes (ICCO 2006). The most fundamental reform to trade policy in this sector was the privatization of CAISTAB in 2000, emanating from structural adjustment reforms. But when export taxes were briefly lowered at the insistence of international donors, export trader margins increased while farmgate prices did not, and short-run international price variability was not passed through to the farmgate (Wilcox and Abbott 2004). That and the civil conflict have led to a reinstatement of some export taxes.⁷

The area planted to cocoa increased steadily until the mid-1980s, after which it remained flat except for a brief but significant expansion around the 1994 devaluation. Yields rose erratically until 1994; between 1994 and 2004, they increased steadily and significantly. These area and yield increases have allowed production and exports to grow, with a strong increase in output after 1994. Although little of Côte d'Ivoire's cocoa is consumed locally, the share of beans processed locally increased considerably after 1999, encouraged by a reduction in export taxes on processed cocoa products (BNETD 2002).

High export taxes, averaging 34 percent of fob (free on board) export value from 1995 to 2004, accounted for much of the difference between farmgate and border prices.⁸ Abbott (2007, appendix table 2) presents cocoa farmgate prices as

a percentage of border prices and shows export taxes since the privatization initiatives began in 1995, when excess profits to the parastatal exporter were replaced by explicit export taxes. Export taxes and exporter margins both steadily increased after 1998, all at the expense of farmers—in 2003 and 2004, farmgate prices as a share of border were at their lowest levels since the late 1970s, when world prices were much higher.

As a result of CAISTAB's stabilization efforts, nominal farmgate prices for cocoa stayed fixed for many years before devaluation in 1994. The resulting tax rate varied with world prices, without reflecting any change in Ivorian government policy. When policy changes were made, they typically reflected earlier changes in the level of world prices. The result was that the correlation between domestic and world prices from 1979 to 1994 was only 61 percent, and the standard deviation of farmgate prices was only 33 percent of that for border prices measured in CFA francs.

Price stability may have stimulated cocoa production, but price levels were relatively low: over the years of successful expansion from 1960 to 1979, farmgate prices averaged only 47 percent of border prices. The key incentive for cocoa production seems to have come from immigration and land tenure policies, which encouraged area expansion despite high taxation. The key role of immigration and land tenure rather than price levels in determining cocoa production could explain why many attempts to estimate cocoa supply functions from price data, such as those by Maizels, Bacon, and Mavrotas (1997), find that production did not rise with prices. The CFA devaluation of 1994 did succeed in stimulating cocoa exports and even yield increases, but farmgate prices from 1994 to 1999 were still only 45 percent of border prices. Only during the 1980–93 recession period were farmgate prices higher than border prices, and that effect is negated when prices are measured at real exchange rates, when a similar 44 percent share is found.

The structural adjustment reforms led to very successful marketing of cocoa by private traders. But it also caused the provision of various public goods to suffer. Complaints focused on lack of credit availability, market information, input provisions, and disease control. Moreover, BNETD (2006) reported significant declines in the quality of cocoa exported from Côte d'Ivoire and a diminished premium for Côte d'Ivoire cocoa on the LIFFE (London International Financial Futures Exchange) commodity exchange. Although new institutions were created to fill these gaps, the continuing civil conflicts made governance problems very difficult to resolve.

Another important part of the cocoa story since 1999 is the increase in processing of cocoa beans into butter, powder, and paste. Before 1999, such processing was

small, and the products were considered to be of inferior quality. Both Archer Daniels Midland (ADM) and Cargill have built processing plants in Côte d'Ivoire that meet the output specifications of their European plants. Processing also benefited from reduced export taxes. In 1999, export taxes on processed cocoa beans were only 9 percent, compared with 33 percent for whole beans. As taxes on raw beans increased, so did taxes on processed products, but those taxes remained nearly 20 percent lower in 2004. Plant managers at ADM and Cargill argue that the quality of products now coming from African plants is as good as that from European plants, but costs are much higher. Without the export tax reduction incentives, processing would still be in Europe (or North America); but with these incentives, more than 25 percent of cocoa beans from Côte d'Ivoire are now processed before export.

Coffee

The coffee story for Côte d'Ivoire is markedly different in some respects from the cocoa story. Most notably, Côte d'Ivoire was Africa's largest coffee exporter in the 1960s, but then experienced declines in its very erratic production and exports. Coffee contributed 35–40 percent of the country's export revenue in the early 1960s, but that contribution fell steadily to only 7 percent in the late 1990s and to only 1.7 percent in 2004. Export taxes were not as high for coffee as they were for cocoa, in part because the drop in world coffee prices was greater. But farmgate prices remained low, averaging 47 percent of border prices.

The area planted to coffee grew steadily until the mid-1980s, then leveled off, before falling around 1990; it has declined steadily from 1999. Yield has been extremely volatile, declining considerably until 1994, when a resurgence occurred. As a consequence, production and exports rose slowly but erratically until the early 1980s, declined until the mid-1990s, increased considerably with the yield advances of the late 1990s, and fell back again after 2001. Exports of processed coffee products have never been large, in contrast to the cocoa case.

Export taxes averaged only 8.3 percent between 1995 and 2004, smaller than the export taxes for cocoa. Trader margins were somewhat higher, with exporter margins reaching 35 percent after 2002 (Abbott 2007, appendix table 17). Farmgate prices averaged 44 percent of border prices from 1960 to 1979, 49 percent from 1980 to 1993, 56 percent from 1994 to 1999, and 48 percent from 2000 to 2005.

In addition to lower prices, coffee producers in the early 2000s were facing many of the same institutional changes and problems as cocoa producers faced. New government entities meant to replace some of the functions of CAISTAB had so far been able to fulfill their promise.

Cotton

The cotton sector in Côte d'Ivoire has been managed somewhat differently from cocoa or coffee, largely because of agronomic and institutional differences. Unlike cocoa and coffee trees, which, once planted, produce crops with few inputs other than labor, cotton requires fertilizer, pesticides, and varietal changes over time. Seed cotton is also ginned in-country, and lint, cotton seed, and other products are then sold. The parastatal CIDT held a monopoly in cotton until privatization began in 1998, when it was broken into three regional companies. But each of those held a monopoly over its specific region, and the state did not divest a majority interest in these companies until 2002. Advocates of liberalization have not insisted on as great a degree of privatization for cotton, and parastatal management has extended to monopoly control of trade since the French colonial period (Goreux and Macrae 2003).

Cotton farmers and cotton exports are also heavily taxed, if less so than cocoa or coffee farmers when ginning costs are considered, and with sustained periods of low world cotton prices leading to apparently higher farmgate prices as a share of border prices.⁹ Lint and other products, not seed cotton, are exported. The international index of cotton lint prices is transformed to a seed-cotton equivalent using the methodology and ginning ratios taken from Baffes (2007). FAO reports cotton lint "producer prices," which are simply seed-cotton producer prices converted to a lint basis using a very similar ginning ratio (FAOSTAT 2006). Seed-cotton prices paid to farmers have been a small fraction of the transformed A Index, averaging 54 percent from 1966 to 1979, 51 percent from 1980 to 1993, 51 percent from 1994 to 1999, and 63 percent from 2000 to 2004. When the overvaluation of the CFA franc is taken into account, the extent of implicit taxation of cotton was even higher in the years before the 1994 devaluation.

The cotton margins include ginning costs, but ginning was done by parastatals that were not privatized until 2002 and still involves some government control. Thus, taxation of cotton is implicit in any excess profits collected by ginners but is hard to measure because ginning costs appear to be reported as the difference between sales prices for lint exports and the prices ginners paid to farmers for seed cotton. Mismanagement has led to losses by these ginners in years of very low world cotton prices. Baffes (2007) adjusts cotton margins to reflect excess costs of these parastatals, and the nominal rate of assistance (NRA) calculations discussed later in this chapter reflect assumptions necessary to make these adjustments.

The patterns seen here are quite similar to those for cocoa and coffee, though conditioned by the unique history of world cotton prices. Moreover, seed-cotton prices from 1966 to 1999 are much like cocoa prices under parastatal management. They remained fixed in nominal terms for several years and only increased (they were never lowered). Increases occurred well after international prices had

increased; the price decline in 1991 reflected a 50 percent drop in international cotton prices. Higher farmgate price shares in the later 1990s and early 2000s reflect low world cotton prices in those years.

The area planted to cotton grew steadily after 1960, leveling off around 1989. Area planted jumped in 1994 with devaluation and then declined during the civil conflict. Seed cotton yields also grew during the 1960s and 1970s. Production grew until 1987, and again after the devaluation, with increased variability. Cotton lint production has mirrored seed cotton production, and because most lint is exported, exports follow the same pattern. Some cotton seed has also been exported since 2000.

These trends indicate that policies during the recession and after the devaluation hurt cotton exports, but that cotton has become an increasingly important export despite the sustained taxation. Recent BNETD data suggest farmers may have received somewhat better prices as the second phase of privatization took effect. But cotton is grown in the north, in territory that was held by rebels for several years. Reports indicate that farmers were selling cotton at lower prices for cash in neighboring countries rather than on credit to the financially troubled Ivorian cotton companies (OT Africa Line 2006). The apparent implicit taxation of cotton farmers since 2000 probably reflects these problems, and BNETD as well as Baffes report that cotton farmgate prices continued to fall after 2004.

Cereals

Rice is one of Côte d'Ivoire's most important agricultural imports; rice imports totaled \$218 million in 2004, or nearly 3 percent of total imports. Imported rice accounts for almost half of the country's rice consumption. Côte d'Ivoire also imported \$73 million worth of wheat, which it does not produce. It does produce maize, millet, and sorghum (as well as rice), but none of these other cereals are traded to any degree. According to the FAO (2003), roots and tubers, especially cassava, are important sources of calories in Ivorian diets, but these are not traded either. Nontradable cereals and roots and tubers (cassava, plantains, yams) accounted for more than half of agricultural production value in the 1960s and for more than one-third in recent years. As noted earlier, a parastatal marketing board managed rice trade until its privatization in 1995, and rice self-sufficiency was a policy goal in the mid-1980s, supported by quantitative restrictions on imports. It appears that the government still influences rice prices and trade, in urban areas, through "voluntary" administered pricing (OECD 2006).

Rice and maize farmgate prices, relative to their international values, are much higher than those typically found for exportables. Rice farmgate prices averaged 96 percent of border prices from 1961 to 1979, 121 percent from 1980 to 1993,

110 percent from 1994 to 1999, and 125 percent from 2000 to 2003. Maize farm-gate price ratios were well above these ratios for rice, and those domestic prices were well above border prices for most of this time. Maize prices averaged 113 percent of the international price from 1966 to 1979, 174 percent from 1980 to 1993, 133 percent from 1994 to 1999, and 134 percent from 2000 to 2004. Maize has never been traded to any significant extent, however, because the cost of importing would exceed that price difference.¹⁰ There are tariffs on food crop imports, but their impact is limited because cereals, roots and tubers are mainly nontradable. For cereals the tariff rate is uniform, averaging 8 percent. Tariffs on roots and tubers are somewhat higher, but the main trade restrictions come from the operations of parastatals using quantitative restrictions and market segmentation.

The area planted to rice has been relatively constant, rising in the mid-1980s when the self-sufficiency policy applied and prices were higher and falling since the devaluation of 1994. Area planted to maize shows a similar pattern. Yields were relatively stable until 1994, when dramatic increases were recorded. These increases look suspiciously like data problems rather than actual technical improvements. Diagne (2006) and WARDA (2004) report that Ivoirian farmers are adopting new rice varieties that could increase yield, but any effect of these varieties would have occurred well after the yield increases shown in the FAO data. In any case, imports of wheat and rice grew until the self-sufficiency period of the 1980s, and remained relatively constant thereafter. Rice imports grew again after 1999, with imports in 2004 more than double those in the mid-1990s.

Information on recent urban rice prices (BNETD 2006; Oryza 2004) show two characteristics of the rice market. One is that local rice commands a premium over imported rice. That premium was 27 percent in 2001 and 41 percent in 2002. The second is that urban retail rice prices are substantially higher than are farmgate or import prices, even after tariffs and the VAT are applied. In 2002, farmgate prices were CFAF 166 for a kilogram of milled rice, import unit values were CFAF 123, imported rice in the Abidjan market averaged CFAF 207, and local rice averaged CFAF 271, according to Oryza (2004). During this same year BNETD reported an urban wholesale price of CFAF 250 and a retail price of CFAF 300 (reflecting the VAT). As noted earlier, the OECD (2006) reports that traders were asked to set urban prices voluntarily (probably at the BNETD reported levels). The BNETD wholesale price yields an urban-rural margin of 63 percent, and an import-to-wholesale margin of 68 percent. The rural-import price differential reflects both transportation costs and the premium on local rice. Taking those into account still leaves a substantial margin for urban rice traders. It appears the current policy restricts imports just as quantitative restrictions did in the past, with little benefit accruing to farmers. Urban traders appear to collect any rents in this system, but restrictions on imports are needed to account for the

import-to-wholesale margin, with segmented markets and the voluntary pricing scheme enabling collusion.

Despite this recent protection, rice imports have expanded greatly in recent years. Because most rice is grown in the north, trade within the country was severely affected by the ongoing civil conflict. This situation would help account for the large urban-rural margin and the urban rice price.

Distortions to Agricultural Incentives

The main focus of the empirical part of the current study's methodology (see appendix A in this volume and Anderson et al. 2008) is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in nonagricultural sectors for comparative evaluation. More specifically, a nominal rate of assistance for producers of the main traded crops is computed. Also generated is an NRA for nonagricultural tradables, for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA).

An assessment of the extent of "average" distortions to agriculture in Côte d'Ivoire is limited somewhat by the focus on the four key commodities the country trades, which account for only about 40 percent of the value of agricultural production. But these commodities are the ones gaining attention in policy discussions and are important in determining the behavior of Côte d'Ivoire's trade both for agriculture and in total. Data and information limitations prevent going much beyond these focus commodities, particularly for historical comparisons. Strong assumptions must be invoked to compute average protection rates for even these four traded products in Côte d'Ivoire. Included, however, are three important nontradable staple food products (cassava, plantains, and yams), whose markets are not directly distorted by government price or trade policies; they raise the product coverage ratio to between 70 and 80 percent.

For the three exportables focused on here, farmgate prices are low relative to world prices. In 2001, farmgate prices for cocoa and coffee were at 50–55 percent of world prices, and cotton was at 57 percent. In 2004, they fell to about 36 percent for cocoa and coffee, and rose to 61 percent for cotton. Explicit export taxes explain these low farmgate prices for cocoa, while high margins and high profits for coffee and cotton traders suggest barriers to entry of some kind.

The civil war has played a significant role in agriculture, increasing domestic trading margins for cocoa. In the case of cotton, privatization appears to have

briefly raised the share of the border price going to farmers, and the effective non-tariff barrier has fallen, but after privatization, margins remain high. A very small explicit export tax (*prélèvement professionnel*) was recently added for cotton; but it is not big enough to affect these results, and explicit export taxes have not been found for other exportables.¹¹

Import-competing products considered here are rice and also wheat, which is not produced domestically. Similar tariffs apply to both crops. Producer price data reveal protection to rice, but wholesale-to-retail margins are larger, which suggests that quantitative restrictions limit entry of competitors.¹²

Table 14.1 presents NRAs for cocoa, coffee, cotton, and rice from 1961 to 2005, while figure 14.2 shows average NRAs for exportables and the one importable. The averages for the exportables show heavy taxation of export agriculture.

These estimates appear to show a great deal of variability over time in agricultural protection (or rather taxation, because the estimates are negative in most cases). NRAs are higher, and taxation of agriculture is lower, in years when commodity prices are low, and they are lower at times of high commodity prices.

The individual crop histories discussed earlier showed much greater similarity in the average extent of taxation during the critical political-economic periods identified earlier. In large part this is because each period witnessed both low and higher international prices. The transition from one period to the next (for example, the beginning of the protracted recession) was often brought about by a sustained change in the relative level of the key international commodity prices.¹³ A key point is that border policy and domestic agricultural policy in Côte d'Ivoire have both responded to world market conditions, isolating to some extent farmers from those extremes, but continuing to tax farmers in most years, especially when world prices were high.

The NRA for the whole sector is generated after making assumptions about the NRA for the exportable, import-competing, and nontradable parts of farm products not covered in this study. Those NRAs are shown in the top rows of table 14.2. The NRA for tradable farm products is then compared with that for nonagricultural tradables using the relative rate of assistance, shown in the lower part of table 14.2 and illustrated in figure 14.3. These RRAs suggest that the prices of tradable farm products, relative to those received by producers of nonfarm tradables, has been depressed by between one-third and one-half over the past five decades.

Conclusions

Côte d'Ivoire is an export-oriented agricultural economy, and the world's largest exporter of cocoa. The country has managed to maintain and grow exports of cocoa despite heavy taxation, thanks to abundant land and immigration of

Table 14.1. NRAs for Covered Farm Products, Côte d'Ivoire, 1961–2005*(percent)*

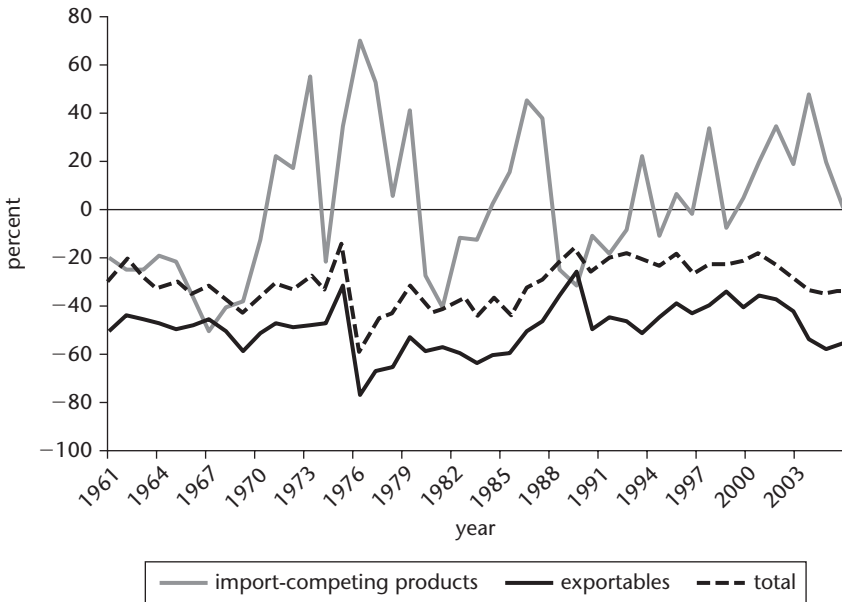
Product indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–05
Exportables ^a	-46.5	-50.4	-48.6	-58.6	-59.8	-43.4	-47.4	-39.4	-47.1
Cocoa	-33.3	-45.4	-40.4	-50.2	-51.9	-37.1	-44.1	-41.1	-49.4
Coffee	-51.6	-52.2	-52.6	-64.0	-69.9	-57.6	-57.9	-39.1	-48.0
Cotton	—	-20.6	-29.2	-24.9	-46.9	-34.9	-38.4	-21.9	-15.0
Import-competing products ^a	-22.3	-37.4	12.2	41.0	-17.8	8.4	-5.4	7.2	23.6
Rice	-22.3	-37.4	12.2	41.0	-17.8	8.4	-5.4	7.2	23.6
Nontradables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cassava	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plantains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total of covered products ^a	-28.6	-35.4	-32.7	-39.8	-40.1	-28.5	-21.7	-22.5	-28.7
Dispersion of covered products ^b	22.9	27.5	33.1	46.2	33.3	33.1	26.2	23.4	32.6
Percent coverage (at undistorted prices)	75	75	76	75	75	80	76	71	72

Source: Data compiled by the author.

Note: — = no data are available.

a. Weighted averages, with weights based on the unassisted value of production.

b. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

Figure 14.2. NRAs for Exportable, Import-Competing, and All Farm Products, Côte d'Ivoire, 1961–2005

Source: Data compiled by the author.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

farmworkers from neighboring countries. From 1961 to 2004, the NRA for cocoa showed an average effective taxation of 44 percent. The comparable NRA on coffee implies even higher taxation, at 55 percent, and coffee exports diminished substantially during this period. Tax rates for cotton were lower, at 29 percent, and that crop has expanded.

The NRA for rice production, a key agricultural import, has averaged 1.3 percent since 1961, but in the early 2000s it stood at 26 percent. Despite rising protection, rice imports have grown over the period of study, driven by increased consumption in urban areas.

Taxation of agriculture appears to be remarkably stable over the four critical political-economic periods in the past 45 years of Ivorian history, but year-to-year variations are significant. In each of the four periods, averages of the NRAs are very close to the long-term average, and the extent of taxation since 1980 is very close to the average before 1980. Taxes for cocoa averaged 43 percent before 1980 and 44 percent afterward. Coffee taxes averaged 55 percent in each of those periods, and cotton taxes averaged about 30 percent in both periods. The change was

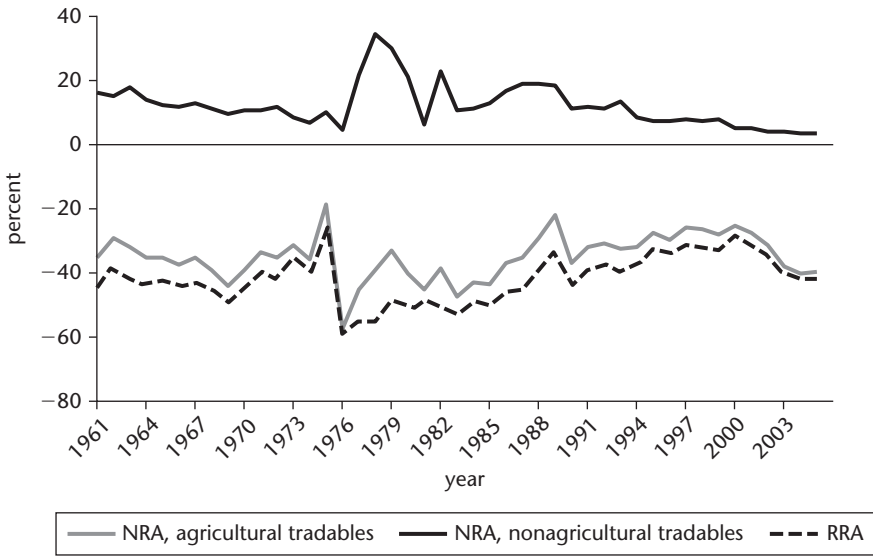
Table 14.2. NRAs for Agriculture Relative to Nonagricultural Industries, Côte d'Ivoire, 1961–2005
(percent)

Indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–05
NRA, covered products	-28.6	-35.4	-32.7	-39.8	-40.1	-28.5	-21.7	-22.5	-28.7
NRA, noncovered products	-8.5	-11.2	-13.7	-2.5	-8.9	-8.5	-12.2	-14.3	-16.3
NRA, all agricultural products	-23.5	-29.3	-28.1	-30.8	-32.2	-24.3	-19.5	-20.0	-25.2
Trade bias index ^a	-0.53	-0.50	-0.55	-0.70	-0.64	-0.54	-0.55	-0.49	-0.55
NRA, all agricultural tradables	-32.9	-38.1	-35.0	-38.6	-42.9	-33.3	-32.7	-27.5	-33.7
NRA, all nonagricultural tradables	15.9	11.7	9.6	20.2	14.7	17.2	11.2	7.5	4.3
RRA ^b	-42.1	-44.6	-40.7	-48.7	-50.2	-43.1	-39.5	-32.6	-36.5

Source: Data compiled by the author.

- a. Trade bias index is $TBI = (1 + NRA_{ag,x}/100)/(1 + NRA_{ag,m}/100) - 1$, where $NRA_{ag,m}$ and $NRA_{ag,x}$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector, respectively.
- b. The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 14.3. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Côte d'Ivoire, 1961–2005



Source: Data compiled by the author.

Note: For a definition of the RRA, see table 14.2, note b.

greatest for rice, where effective tariffs were -1 percent from 1960 to 1979 and 24 percent afterward.

The long-term stability of export taxes, despite large variations in yearly taxation rates, reflects the stabilization objective of Ivorian agricultural policy, and the endogeneity of agricultural taxation. Very high tax rates have been lowered in years of low international prices, sheltering farmers from the full effects of international price volatility, but taxing them nevertheless.

One of the main forces for change of Côte d'Ivoire's agricultural policy has been structural adjustment reforms. These have included pressure to reduce export taxes and to privatize the parastatal agencies that have managed the key agricultural sectors. The government of Côte d'Ivoire in the past has not taken ownership of these reforms, and since the first reforms began in 1981, trade liberalization efforts have begun and stalled and then begun again. More recent efforts since the 1994 devaluation and particularly after 2000, when CAISTAB was finally privatized, might have finally been effective in making this a more open, market-oriented economy, but the recent civil conflict has put reduced agricultural taxation on hold.

It is not entirely evident that these reforms are always in the national interest. Farmers have objected to the price variability they now face. More important, as a large exporter of cocoa, some export taxes may be in the national interest even if not in farmers' interests. Yilmaz (1999) estimated that optimal export taxes for cocoa from Côte d'Ivoire were around 30 percent, only somewhat lower than the historical rate of taxation. Others have shown that quotas, and parastatal management, can also exploit Côte d'Ivoire's market power in cocoa (Panagariya and Schiff 1992). Tax revenues were intended to help stabilize prices but were more often used to finance diversification of exports and industrial development. Gilbert and Varangis (2003) argue that if structural adjustment raised farmgate prices for all the African exporters of cocoa, supply expansion could have frustrated the intent of this initiative to improve farmer welfare by lowering world prices. Abbott, Wilcox, and Muir (2005) note that imperfectly competitive private traders have at times raised margins when structural adjustment reduced taxation, and those margins fell again as taxes were subsequently raised. In neighboring countries, where reforms have gone further, farmgate prices remain a fraction of world prices, and imperfectly competitive behavior by traders is found, resulting in weak transmission to farmers of world price fluctuations. The share of farmgate prices in consumer goods prices is notoriously small, and large multinationals that may have market power intervene between consumers and cocoa farmers (Dorin 2003; Fold 2002; Losch 2002). Thus, the effects of the longstanding structural adjustment reforms in Côte d'Ivoire, even in the brief periods when they were more seriously applied, have not led to significantly higher farmgate prices.

Early analysts emphasized the institutional structure of markets and policy in Côte d'Ivoire. Immigration and land tenure policies were important, at least before 1994, in explaining supply response and expansion of cocoa exports. The laissez-faire parastatal management of cocoa and coffee interfered little with cocoa production beyond the collection of taxes at the port. Lessons after privatization have been that the private sector can continue to market cocoa effectively, that taxes are not necessarily reduced, and that a role for government remains. Farmers' complaints about prices reflect as much the problems of poor market information when panterritorial, stable prices no longer apply. Quality deterioration, credit availability, ineffective disease and pest management, and the need for research and extension show that some government involvement must persist; each of these aspects had been addressed by policy before 2000. Newly invented "private" institutions have attempted to cope with some of these problems in a difficult political environment.

One must be careful in advocating simplistic policy solutions for Côte d'Ivoire's agricultural sector. Multilateral trade liberalization, if it involves only

tariff changes, is unlikely to have a large effect. It is difficult to find any effect of the 1995 Uruguay Round agreement (FAO 2003), in part because structural adjustment, not trade commitments, dictated any actual reforms, and in part because the trade agreement occurred at the same time as the 1994 devaluation. But institutionally set prices changed only slowly in response to these forces. That sectors improved even in cases where positive changes in farmgate prices are not immediately evident demonstrates the importance of accompanying institutional changes.

The most powerful political economy factor dictating policy and performance in Ivorian agriculture has been civil conflict. It has influenced the specifics of agricultural policy through the north-south division of the country and through impacts on immigrant labor. It has frustrated the intent of recent, more serious liberalization efforts. It is unfair to judge the potential of greater agricultural liberalization until those problems are solved. But both the successes and the problems of agricultural exports in Côte d'Ivoire highlight the need to solve governance problems so the state can perform its appropriate role in agriculture.

Notes

1. GDP per capita measured in constant 2000 U.S. dollars (World Bank 2006b).
2. Economic performance data are from World Bank (2006b) and IMF (2006).
3. Abbott (2007, appendix figure 4) shows the official exchange rate in Côte d'Ivoire from 1960 until 2005. It also shows the consumer price index, a measure of inflation, as well as two indicators of real exchange rates, and so the extent of overvaluation over time.
4. Abbott (2007, appendix figure 5) shows international price indexes for key agricultural goods: cocoa, coffee, cotton, maize, and rice.
5. Because Côte d'Ivoire exports as much as 40 percent of the world's cocoa, it may be a large country affecting the world price. Yilmaz (1999) has investigated the optimal export tax under this circumstance, and argues this is the case. In the trade, an increase in world market prices for cocoa has been attributed to the civil conflict in Côte d'Ivoire, with spikes evident at critical times.
6. The CIDT was broken into regional companies in 1998, including *Nouvelle CIDT*, *Compagnie Cotonniere*, and *Ivoire Coton*, but the government did not divest its majority interest in these regional companies until 2002.
7. Abbott (2007, appendix figure 6) shows the evolution of cocoa production and trade in response to these distorted incentives.
8. The DUS (*Droite unique de sortie*) is a specific tax, as are most of the *prelevements professionnels*, but they have been changed often, even during seasons, in response to changing world market conditions.
9. Abbott (2007, appendix table 18) shows cotton farmgate prices for seed cotton, compared to the Cotlook A Index, an international indicator of cotton lint prices. That table also compares cotton lint export unit values to the FAO cotton lint "producer price," which show a very similar pattern to the seed cotton prices.
10. Data showing very limited trade of maize and other staple home goods and the disconnection between domestic and world maize prices support this assertion.
11. Data reported for bananas reveal low farmgate prices relative to border prices, suggesting the presence of a nontariff barrier or high margins, as in the case of cotton. Farmgate prices for palm oil are higher, indicating little intervention. Both bananas and palm oil are produced on plantations,

which were to be privatized in 2002, but this has resulted in little change in the share of the world price accruing to farmers.

12. Fruits and vegetables and other agricultural products are now typically charged a 20 percent most-favored-nation tariff. The average tariff for fruits and vegetables was somewhat higher in 2001, and somewhat lower for agricultural products overall. These current tariffs are similar to the protection afforded to manufactured goods. There are exceptions to all these most-favored-nation tariffs for special cases, however.

13. Abbott (2007, appendix figure 5) shows that these international prices tended to move together, if imperfectly, with peaks (mid-1970s, mid-1990s) and valleys (around 2000, mid-1980s) occurring simultaneously.

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GHANA

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Ghana's economic performance of the recent past can be described as a qualified success. Since 1986, real gross domestic product (GDP) has grown at an annual average of more than 4 percent, enabling per capita incomes to increase by a total of 30 percent between then and 2004. With rising incomes has come an associated decline in poverty: the incidence of food poverty has fallen from an estimated 37 percent of the population in fiscal 1991 to 27 percent in fiscal 1998 (Ghana Statistical Service 2000). This performance is much better than that recorded elsewhere in Sub-Saharan Africa, where per capita incomes have on average remained static and poverty reduction has been sparse. On the other hand, it has done little more than return Ghana's per capita income to its level at independence in 1957, and it compares unfavorably with the faster pace of growth and poverty reduction in other regions, notably in Asia.

Nevertheless, the stable state of the economy, linked to more than a decade of democratic government, contrasts sharply with the situation in the early 1980s, when the economy lay in ruins. Stryker (1990, 1991), in his contribution to the study led by Krueger, Schiff, and Valdés (1991), notes that agricultural distortions played a key role in the disintegration of the Ghanaian economy. That study, which examined the evolution of agricultural policies and their consequences from the period before independence to the mid-1980s, when liberalization and structural adjustment were initiated, identified chronic macroeconomic instability, increasing

* The authors would like to thank Ivy Drafor for information on agricultural markets in Ghana. They are also grateful to for helpful comments from Will Masters and other workshop participants. Detailed data and estimates of distortions reported in this chapter can be found in Brooks, Croppenstedt, and Aggrey-Fynn (2007).

currency overvaluation, strict controls over the economy in general and the agricultural sector in particular, and ineffective state interventions as the sources of decline. Mismanagement of the cocoa sector had a particularly damaging effect on Ghana's economic performance. At the political level, there was great instability, with regime changes leading to policy reversals and with rent seeking by vested interests to such an extent that by 1983 the economy had effectively devoured itself, and there were no more rents left to extract.

This chapter aims to bring Stryker's analysis up to the 21st century. In recent years Ghana has followed International Monetary Fund (IMF) stabilization and World Bank structural adjustment programs and moved into a "postreform" phase, where the effects of liberalizing reforms are being digested and the benefits of further reforms are being queried. Numerous studies have described Ghana's economic and agricultural policies and performance, including periodic World Bank reviews. However, since Stryker's empirical analysis, there has been no comparable attempt to quantify agricultural policy distortions, assess their economic impacts, and place their importance in the context of Ghana's broader development challenges.

A general finding of the current analysis is that the profound policy distortions that characterized Ghana's agricultural sector until 1984 have been reduced substantially. The exchange rate, which now floats, is no longer consistently overvalued, and trade policies are relatively even in their treatment of different sectors, with relatively uniform tariffs and with logical exemptions—for example, for inputs and products conducive to improved health and education. Improved macroeconomic and political stability and greater transparency in the policy process have meant that the prospects for agricultural development are much enhanced.

Nevertheless, as of the mid-2000s important distortions still afflicted Ghana's agricultural sector. Import-competing sectors were protected by the standard tariff of 20 percent, and there was some implicit taxation of exports. In the case of cocoa, the marketing board's share of the export price had risen with increases in the world market price, dampening incentives to invest. However, the main distortions lay not in the realm of explicit sectoral policies but in the way in which underdevelopment of physical infrastructure, weak credit markets, and stalled structural reforms (including to the country's financial markets) hampered progress.

Government spending on agriculture remained low, at consistently less than 2 percent of all public spending. The 2004 share of just 1.3 percent contrasted with the target established in the Maputo Declaration of 2003, where African heads of state and the government committed themselves to increasing national expenditures on agriculture and rural development to 10 percent of all budgetary

expenditures. Donor aid increased substantially, with the net inflow of aid climbing from an average of 2.8 percent of GDP between 1996 and 2000 to 7.1 percent of GDP between 2001 and 2003, in part a result of debt relief (Bank of Ghana 2005); but that aid was not systematically targeted to agriculture.¹ As a complement to domestic spending, this injection provided real opportunities to remedy deficiencies in the functioning of both output and factor markets. The key challenge was to ensure that these monies are spent in suitable public investments, rather than in measures that distort producers' incentives by leading them to invest in agricultural activities without a sustainable future or that use purchased inputs excessively.

With such reforms, agriculture can play its part in lifting Ghana's growth rate from levels that barely exceed population growth to the 6–8 percent target established in Ghana's revised poverty reduction strategy (National Development Planning Commission 2005), a level that, it is estimated, would enable Ghana to achieve middle-income country status by 2015.

Economic Growth and Structural Changes

Ghana's economic development can be divided into four broad phases: the period before independence in 1957, the postindependence period from 1957 to 1983, the years of stabilization and adjustment between 1983 and 1992, and the postreform period from the elections of 1992 onward.

Before independence in 1957

Before independence, agricultural policy in Ghana emphasized the production of export commodities, such as cocoa, coffee, and oil palm and paid little attention to noncommercial production or the development of staple food crops for domestic consumption. In general, overall economic policy focused on natural resource extraction, with minimal colonial oversight of other sectors of the economy.

Some of the subsequent apparatus of government intervention, notably marketing boards, were established during this period. A particularly important institution, the Cocoa Marketing Board, was established by the colonial government during the Second World War, and became the monopoly buyer of cocoa at a fixed price paid to producers. Until 1951, the majority of the marketing board's profits were absorbed by the reserves of the board. In that year, however, taxes were raised and cocoa profits were diverted to general public investment.

Internal self-government was ceded to Ghana in 1951, and the country's first leader, Dr. Kwame Nkrumah, attempted to foster rapid economic and social development by investing reserves that had accumulated during the Second World War

and cocoa earnings that were boosted by the commodities boom induced by the Korean War.

Postindependence, 1957–83

Ghana's economic performance after independence in 1957 was undermined by political instability, ideological splits, and policy reversals.

At independence, Ghana had one of the highest per capita incomes in Africa, placing it on a par with middle-income countries by today's standards. The country was the world's largest producer of cocoa and had external reserves equal to three years of imports. Cocoa prices began to decline significantly after 1957, yet the government continued to spend money on a large scale, even when revenues fell, and from about 1961 onward became more heavily involved in central planning, rather than limiting spending to public goods.

In 1961, the Cocoa Marketing Board was granted a monopoly on all purchases of cocoa from farmers in Ghana, replacing the existing network of private agents, traders, brokers, and other middlemen. Despite falling cocoa prices, substantial increases in production as a result of new planting meant that Ghana's export revenues remained relatively constant. Because production and marketing costs increased with the expansion of output, profits were squeezed and government revenues declined. With rising imports for public investment, Ghana's current account deteriorated and its foreign exchange reserves dwindled. In response, the government introduced foreign exchange controls and import licensing. From 1961, public spending shifted away from the provision of public goods toward the development of large state-owned enterprises (SOEs) designed to substitute domestic production for imports.

When world cocoa prices collapsed in the second half of 1964, the only way the government could meet its expenses was by printing money. This move fueled inflation and lowered real wages, thereby undermining support for the Nkrumah regime, which was ousted by a military coup in February 1966. By this time, per capita GDP was not much higher than it had been in 1951. After a brief adjustment of policies, government was handed over to the democratically elected Kofi Abrefa Busia (1969–71). He too was ousted by the military, whose (corrupt) rule and continued mismanagement of the economy further depressed real incomes between 1972 and 1979. The deteriorating economic and political situation eventually led to a coup by junior members of the armed forces, led by Flight Lieutenant Jerry J. Rawlings. A brief return to civilian rule (1979–81), marked by ineffectiveness and allegations of corruption, was ended by Rawlings' second coup and the establishment of the Provisional National Defense Council in 1981.

Rawlings' government embarked initially upon a course of populist policies, but after two years it became apparent that these policies would not arrest the

country's economic decline. In addition to the already serious economic and political situation, Ghana faced drought and bushfires in 1983 as well as the forced return of more than 1 million Ghanaians from Nigeria.

The nadir was reached in 1983. At the root of this collapse lay unsustainable levels of government expenditure, an increasingly overvalued exchange rate, import licensing, inflation and price controls, and heavy state involvement in the running of the economy (Tsikata 1999; Leith and Söderling 2000). For example, in 1984, about 2.5 percent of the population was employed in the civil service, one of the highest ratios in Africa at the time. Public enterprises and boards employed another 2 percent. Preliminary audits conducted in 1986 indicated that tens of thousands of "ghost workers" were on the public sector payroll (Alderman, Canagarajah, and Younger 1993).

Agricultural policy (discussed later) was fundamental to the dissolution of the Ghanaian economy in the early 1980s. In particular, cocoa prices were falling, and the overvaluation of the cedi implied that the domestic currency equivalent of the fob (free on board) export price of cocoa was falling faster still, exacerbating the struggle between farmers and the government over cocoa revenue. This situation was further aggravated by the rising costs of the Cocoa Marketing Board and by the smuggling of cocoa to neighboring countries where producer prices were much higher at the black market exchange rate (Stryker 1990). The result was a steadily deteriorating economic situation and widespread rent seeking, which increasingly undermined Ghanaian institutions and society.

By the early 1980s, Ghana had been surpassed by at least half the countries of Sub-Saharan Africa in per capita GDP. Government revenues fell from 15 percent of GDP in the early 1970s to 6 percent in 1982. Public sector wages fell by an annual average of 10 percent in real terms between 1975 and 1983. Export earnings fell to a low of 7 percent of GDP, and external financing dried up. Moreover, price controls led to much economic activity taking place in parallel markets and to a general shortage of goods and services.

Reform and adjustment, 1983–92

The government responded by introducing a number of ad hoc programs to deal with the emergencies and in April 1983, under the auspices of the IMF and the World Bank, initiated a program of economic stabilization and market reform known as the economic recovery program. The reform strategy included a realignment of relative prices, the removal of direct controls and interventions, a restoration of fiscal discipline, and the implementation of structural and institutional reforms. It also reinstated the necessary fundamentals for economic growth. In conjunction with increased inflows of external financing, real GDP rose by about 4 percent per year between 1983 and 1992.

Of central importance to the economic recovery program was exchange rate policy. By 1982, the cedi was estimated to be overvalued by 1,000 percent (Leechor 1994). In April 1983, the government established a multiple exchange rate system, which was abolished six months later in October. Following a series of devaluations, a public auction system was established in 1986 for most transactions that did not involve cocoa, petroleum, and official debt service. In February 1987 the official and auction exchange rates were unified. Devaluation rapidly lowered the black market premium, and the introduction of foreign exchange auctions with a gradual move to a managed exchange rate virtually eliminated it by the 1990s.

The budget was balanced by 1986, thanks to stronger government revenues deriving from exchange rate and tax reforms. With improved fiscal discipline and lower government financing needs, monetary growth was also kept in check. Inflation was thus brought under control, falling from 123 percent in 1983 to 10 percent in 1992. But it was difficult to sterilize inflows of foreign assistance, which became increasingly important from the mid-1980s onward, and so inflation was not fully tamed. Moreover, fiscal and monetary discipline started to weaken in the run-up to elections in 1992.

State-owned enterprises were a major area for reform. In the mid-1980s more than half of value added and employment was reported to be in SOEs. But reform proved more complex for both practical and political reasons, and not until 1990 were any sell-offs actually made. Similarly, financial reforms involved an evaluation of nonperforming loans and a deregulation of credit and interest rates. However, the reform of rural banks proved difficult.

Despite pursuing populist policies, the Rawlings government did not incur debt, but with the adoption of more orthodox economic management, foreign governments and multilateral agencies were increasingly eager to invest in Ghana. As a result, the ratio of debt to GDP increased from 41 percent at the outset of the economic recovery program to 63 percent at the end of the decade, and to 85 percent by the mid-1990s.

1992–2004

When democratic elections were held in 1992, several politically sensitive and administratively complex reforms that remained unfinished became subject to the vagaries of electoral competition. These included the reform of the cocoa sector, the divestiture of state-owned enterprises, and the establishment of effective tax collection and expenditure control systems for government (Leith and Söderling 2000).

With civilian rule, government expenditures continued to rise and the public deficit mounted. A significant share of this deficit was financed by printing money, which led to a surge in consumer price inflation. From 1994 onward, there

was also significant borrowing from abroad (more than 3 percent of GDP). Accordingly, the ratio of total external debt to GDP spiraled from 88 percent in 1994–96 to 119 percent in 2000–02, although by 2004 it was down to 80 percent. Through the 1990s, debt service as a ratio of export earnings averaged 25–30 percent, which exceeds the 20–25 percent level that is deemed to be sustainable under the Heavily Indebted Poor Countries Initiative. However, the ratio dropped significantly in the early 2000s and was down to 7 percent by 2004 (World Bank 2006b).

With a market-determined exchange rate and a weakening fiscal position, the real exchange rate depreciated sharply in the early 1990s (table 15.1). This stimulated export growth, with the share of exports to GDP increasing to rates comparable to those in the 1960s before exchange controls started to bite in 1995. Yet the substantial financing of the government's budget by transfers from foreign donors, foreign borrowing, and a surge in private remittances meant that the rapid depreciation of the real exchange rate had little dampening effect on imports.

The government had difficulty in constraining the public deficit and, with limited domestic savings, the balance of payments deficit. A value added tax was introduced in 1986, only to be withdrawn shortly afterward following protests. It was successfully reintroduced in 1998 but at a lower rate (10 percent compared with an original proposal of 17.5 percent). The tax actually replaced a sales tax but was applied on a broader base and linked to improved record keeping and enhanced compliance. As a result, revenues ultimately increased. A constitutional amendment passed in 2002 made it illegal for expenditures to exceed revenues by more than 10 percent.

A structural problem arose when support for the SOEs was removed—the private sector did not have the capacity to fill the gap, and many services were not provided. One might ask if a phased government withdrawal, through public-private partnerships, may not have been more appropriate. In that context, the initially slow pace of privatization may have been a blessing. The divestiture of SOEs gathered pace in the 1990s and has been favorably reviewed (Ghana Divestiture Implementation Committee 1997).

Only in the late 1990s were the nonperforming assets of the economy tackled. In 1998, 23 of the 133 rural banks that were in operation had their licenses withdrawn (Leith and Söderling 2000). But human capital remained a problem for rural banking, with the result that management was still often poor, and rural banks continued to accumulate bad debts.

After 1992, modifications made in trade policy were relatively minor. In the mid-2000s, Ghana had a relatively simple tariff structure, comprising three rates: a low rate of zero (with some items recently raised to 5 percent) reserved primarily for primary products, capital goods, and some basic consumer goods; a moderate rate of 10 percent applied primarily to other raw materials and intermediate inputs, as well

Table 15.1. Trade and Exchange Rate Performance, Ghana, 1966–2004

Trade indicator	1966–70	1971–75	1976–80	1981–85	1986–90	1991–95	1996–2000	2001–04
Exports of goods and services (percent of GDP)	19	19	11	7	18	21	36	41
Exports of goods and services (annual percent growth)	–1.9	–2.8	–7.9	–1.6	9.2	7.1	12.3	1.1
Trade (percent of GDP)	39	38	22	14	42	53	87	97
Official exchange rate (LCU per US\$, period average)	0.9	1.2	1.9	21	208	722	2,825	8,196
Real effective exchange rate index (2000 = 100)	—	—	802	1,306	190	139	137	101
Black market premium (percent)	72	35	367	1,289	47	3	1	0

Source: World Bank (2006a).

Note: — = no data are available. LCU = local currency unit.

as to some consumer goods; and a higher rate of 20 percent, mainly on final consumer goods. In addition, imports could be exempted from import duties under several programs, and manufacturers could apply for permission to import raw materials and intermediate inputs at concessionary duty rates. Zero-rated goods accounted for an estimated 13.5 percent of imports (Haizel et al. 2002). In addition, Ghana did not differentiate between imported and locally produced commodities in its domestic indirect taxes, so there were no distortions in this area.

In 1999, Bajracharya and Flatters argued for more comprehensive tariff reforms, suggesting that additional revenues could be obtained by tightening exemptions, adjusting the tariff rate structure, and making administrative reforms. They concluded that the greatest potential for revenue improvement, as well as for significantly enhanced trade facilitation, was most likely to be found in administrative reform of customs and related procedures; they suggested that revenue increases of 20 percent were possible (on a base that included import-related excises and value added taxes as well as import duties). Inspection agencies charged a 1 percent fee for these services, and an ECOWAS (Economic Community of West Africa States) customs duty of 0.5 percent is levied on imports from non-ECOWAS countries.

In a subsequent review undertaken for the United Kingdom's Department of International Development (Haizel et al. 2002), it was similarly concluded that low tariffs could enable Ghana to abolish the duty drawback and would help ensure fairness, transparency, consistency, and efficiency in customs administration. The study also noted the need to improve port clearance and turnaround time, a point reinforced in a World Bank study (World Bank 2006a), which noted that it took an average of 55 days for imported goods to clear customs and reach factory warehouses, and an average of 47 days for exports to leave the factory and clear the port of exit. That was much longer than the efficient benchmark (5 days for exports and imports in Denmark), and also substantially higher than the recorded times in Côte d'Ivoire, Nigeria, Senegal, and Togo.

In overall terms, the policy environment in Ghana in the mid-2000s contrasted sharply with that prevailing up to 1983. Yet policy reforms had not been fully consolidated, nor had they been accompanied by the structural reforms needed to make them work. As a result some reform fatigue had set in, along with some questioning of the process itself. A loss of momentum could threaten improvement in the design and implementation of reforms.

Economic performance

In the early 2000s, growth was holding steady at about 4–5 percent annually. With population increasing at 2.5 percent per year, per capita income had grown 2–3 percent per year since the mid-1980s.

With such growth rates, it is estimated that absolute poverty in Ghana could be eradicated in 30–40 years (Hadjimichael et al. 1996). Indeed, 20 years of 4–5 percent growth has done little more than bring per capita incomes back to the levels enjoyed in 1957, when Ghana attained independence. Recent economic performance has been more robust, with real GDP growth reaching 5.8 percent in 2004, a percentage point above the average for 2001–03. Agriculture was the strongest component of overall growth, with particularly strong production growth in the cocoa sector, which has benefited from government-sponsored crop improvement and disease control programs.

Inflation rebounded in the 1990s, reaching 60 percent in 1995 and 25 percent in 2000 as the government failed to contain budget deficits. The government's overall fiscal deficit worsened to 8.2 percent of GDP in 2000, and the current account deficit deteriorated to 10.6 percent of GDP. The real effective exchange rate reached a corresponding low in 2000 and remained relatively stable afterward. A particular problem has been fiscal profligacy in election years and government responsiveness to special interest groups, such as doctors, cocoa board members, railway employees, and civil servants (Leite et al. 1999). The failure to consolidate macroeconomic stability has undermined investment and, with it, the country's long-term growth.

Ghana's trade performance improved considerably after the mid-1980s. In response to lower taxation and fewer controls, exports grew at an annual average of 10 percent between 1984 and 1994, while imports grew at a similar pace. This growth enabled the share of exports in GDP to recover from an average of 6 percent in 1981–85 to more than 20 percent in the 1990s and to more than 40 percent between 2001 and 2004 (table 15.1).

Following reform, the strongest performing sectors were mining, utilities, construction, and most services, in particular transport and the wholesale-retail sector. Manufacturing grew rapidly in the 1984–86 period, but its rate of growth then fell below the economy's overall rate. More recently, nontraditional exports—mainly processed and semiprocessed goods—have become increasingly important. Exports of nontraditional goods (both agricultural and nonagricultural) increased from \$24 million in 1986 to \$402 million in 1998, and to \$636 million in 2005; their share of total exports grew from about 5 percent to more than 25 percent over this period.

Reforms have been complemented by increased aid flows and migrant remittances. Total aid flows jumped significantly between 1989 and 1992 as donors aimed to support institution-building activities in the run-up to the multiparty elections set for 1992 (Tsikata 1999). More recently they have climbed again as part of a concerted effort to accelerate growth in Sub-Saharan Africa. Private remittances exceed the combined total of official transfers, official capital, and

private capital flows, amounting to \$1.3 billion, or 15 percent of GDP, in 2004 (IMF 2005) and reportedly exceeding \$3 billion in 2005.

Ghana's varied economic fortunes have been reflected in the performance and relative importance of the agricultural sector. As the economy collapsed, agriculture assumed an important buffer role, with its share of GDP rising to 60 percent in the early 1980s. Since then, agriculture's relative importance has declined, conforming to the general pattern whereby economic development is accompanied by a shift of resources to nonagricultural activities. Yet at one-third of national income, agriculture was still almost as important as it had been 40 years earlier. Agricultural growth was, equivalently, slower than growth in other sectors, partly reflecting the aforementioned shift of resources between sectors, and partly as a consequence of lower commodity prices. Since 2001, agricultural growth on average matched the overall growth rate of 5 percent, as commodity prices have recovered.

Poverty

On the basis of the Ghana Living Standards Survey data and a food poverty line set at the estimated annual expenditure per person required to meet minimum nutritional requirements, the poverty incidence in Ghana fell from 37 percent in fiscal 1991 to 27 percent in fiscal 1998. Given the rise in the population numbers, this decline means a drop from 5.8 million to 5.0 million people faced with food poverty. Christiaensen, Demery, and Paternostro (2002) report consumption poverty indexes for 1992 and 1998 of 51 and 39 percent, respectively, based on the food intake required to meet a minimum caloric intake with adjustments for essential nonfood consumption.

There were large rural and regional differences in poverty levels and their changes. Poverty fell steeply in greater Accra and other regions but increased in the central, northern, and upper eastern regions. At the national level, the reduction in poverty resulted almost entirely from economic growth. The overall redistribution effect was negligible, although it played an important role in the Accra region where reduced inequality helped to reduce poverty significantly (IMF 2000). Worsening inequality elsewhere, especially in the urban coastal region, offset this positive development.

The economic recovery program and the resulting economic growth led to significant improvements for households engaged in export farming and for those in formal employment, in both the public and private sectors. Households in the food crop farming sector continued to perform worst, with the incidence of food poverty falling from about 52 to 45 percent for this group between fiscal 1991 and fiscal 1998. By fiscal 1998, households in the food crop farming sector accounted for 65 percent of national poverty, up from 62 percent in seven years earlier,

indicating that the recovery program primarily benefited export-oriented farmers. Outside the export sector, agriculture grew sluggishly and, with weaker income growth and fewer nonfarm income-earning opportunities, the welfare of food crop farmers was negatively affected. Growing poverty was particularly prevalent in the northern parts of the country, where farmers were most dependent on food crops and experienced lower agricultural incomes and also lower off-farm earnings.

Agricultural Policies in Ghana

Agricultural policies in Ghana during the study period formed an important part of the general setting of policy, and shifts in sectoral policy generally matched reorientations in overall policy. In particular, policy toward the cocoa sector went through dramatic changes, which had a hugely important impact on Ghana's collapse and subsequent recovery.

Ghana's agricultural policies before 1983 are thoroughly described by Stryker (1990, 1991). They included price controls; input and credit subsidies; obligatory credit allocations; and heavy state involvement in production, distribution, and marketing. As with economic policy in general, 1983 saw a completely new approach to agricultural policies. The government privatized state farms, removed price controls, and gradually reduced subsidies on inputs such as fertilizer. In 1990, the government removed the guaranteed minimum price paid to farmers for selected food crops (mainly maize and rice) and in 1992 abolished input subsidies altogether.

Before reforms, procurement was facilitated through the Agricultural Development Board, which was set up in the 1960s to buy maize and rice at guaranteed prices and store them in an effort to stabilize prices. This organization was superseded by the Ghana Food Distribution Corporation, which was established in 1975 and dissolved in 1987. On average, the corporation bought less than 5 percent of the maize and rice produced in the country; its effectiveness was constrained by a lack of storage facilities and weak infrastructure (Puplampu 1999).

In 1986–88, the government drafted a new agricultural policy, called the Ghana Agricultural Policy: Action Plan and Strategies 1986–88. Key objectives outlined in this initiative were self-sufficiency in cereals, starchy staples, and animal protein food, with priority for maize, rice, and cassava in the short term; maintenance of adequate buffer stocks for price stabilization and food security during shortfalls; and improvements in institutional facilities such as research, credit, and marketing. Putting these objectives into practice proved difficult, however, in part because of the weak institutional capacity of the country.

The government, in collaboration with the World Bank, consequently embarked on the Agricultural Services Rehabilitation Project over the 1987–90

period. The main objectives of the project were to strengthen the institutional framework for formulating and implementing agricultural policies and programs, improve the delivery of public sector services, and improve the procurement and distribution of agricultural inputs by way of privatization.

The project did succeed in strengthening the capacity of agricultural research, extension, irrigation, and policy-planning institutions. To build on these short-term improvements, the government, with support from the World Bank, decided to implement a more strongly resourced medium-term program, focusing on the key areas of agricultural research, extension, livestock, fisheries development, and export promotion. The Medium Term Agricultural Development Program covered the 1991–2000 period and was broadly aimed at increasing productivity and competitiveness in the agricultural sector. A number of stand-alone projects were launched under the program, such as the National Agricultural Research Program, the National Agricultural Extension Program, and the Fisheries Capacity Building Project.

Despite the increased attention given to agriculture, growth in the sector remained relatively sluggish throughout the 1980s and the first half of the 1990s. The much-improved performance in the second half of the 1990s was largely a result of the improved macroeconomic environment. Structural weaknesses, such as inadequate roads, poor access to markets, inappropriate agricultural practices, and low technology, were and (despite some improvements) remain key constraints to growth.

In 2003, the Ministry of Agriculture developed a Food and Agriculture Sector Development Policy, intended to enhance food security, reduce poverty, supply raw materials to industry, and ensure the sector's continued contribution to economic growth, foreign exchange, and government revenue. Reflecting the market orientation of government policies more generally, the private sector was seen to be the main engine for delivering on these objectives. The main break with the past was policy's focus on a sectorwide approach to agricultural development, contrasting with the discrete project approach pursued in the past. The new policy was expected to contribute to Ghana's poverty reduction strategy through infrastructure development, the promotion of appropriate technologies, and improved extension services.

However, a 2004 Poverty and Social Impact Assessment of the strategic objectives for agricultural policy criticized the strategy as a one-size-fits-all policy that did not take account of the diverse needs of different stakeholders in the agricultural sector, notably the very poor and women. Accordingly, a broader revision of the policy was being developed in the mid-2000s, spelling out more clearly what a sectorwide approach entails, providing guidance for a six-year policy plan, and achieving consensus among stakeholders including donors.

Cocoa policy

The government's policy toward cocoa, the country's biggest export earner, has been a major component of its overall economic policy and has changed along with the general orientation of economic policy over time.

Ghana became the world's leading producer of cocoa by 1911, a position it retained until the mid-1970s. By 1921, Ghana produced 32 percent of the world's cocoa. Small farms have always been the basis of Ghana's production (there are about 1.6 million small-holder farmers growing cocoa, mostly on plots of three hectares or less) with plantations never of much importance. Until the Second World War, private firms handled domestic and external marketing, but during the war the colonial government took over the purchase of cocoa, selling it to the British Food Ministry (Leith and Söderling 2000). In 1947, the Cocoa Marketing Board was established, with a monopoly over internal and external marketing. The influence of this board (after 1979 called the Ghana Cocoa Board, or COCOBOD) in the industry was pervasive, covering extension services, input marketing, and the maintenance and rehabilitation of roads in cocoa-producing villages.

Initially set up to protect farmers from price volatility, the Cocoa Marketing Board gradually turned into an instrument of public taxation (Stryker 1990). Rents were extracted by keeping producer prices well below the world price, and by using an overvalued exchange rate to make payments to farmers. Inefficiency, corruption, the increasingly poor state of roads, and the shortage of spare parts meant that costs accounted for an increasingly large proportion of the fob export price. In 1981, the black market exchange rate was 44 times the official rate, and the marketing board's costs exclusive of the price paid to producers exceeded the fob sales at the official exchange rate. Continued inflation meant that even after the official exchange rate was devalued during 1985 and 1986 by a factor of 33, from 2.75 to 90 cedis per U.S. dollar, the board's costs still accounted for 28 percent of the total value of sales (Stryker 1990).

Between 1967 and 1977, the system for purchasing and marketing cocoa gradually broke down as the economic situation deteriorated. By 1982, the amount of unshipped cocoa was about one-half of that harvested. Smuggling had also become increasingly attractive, with an estimated 20 percent of the crop being smuggled out of the country in the late 1970s and early 1980s. Output had stagnated following independence and began to fall in the early 1970s. Falling world cocoa prices from the late 1970s, aging trees, widespread disease, and poor weather (bushfires in 1983 destroyed some 60,000 hectares under cocoa) also contributed to the decline.²

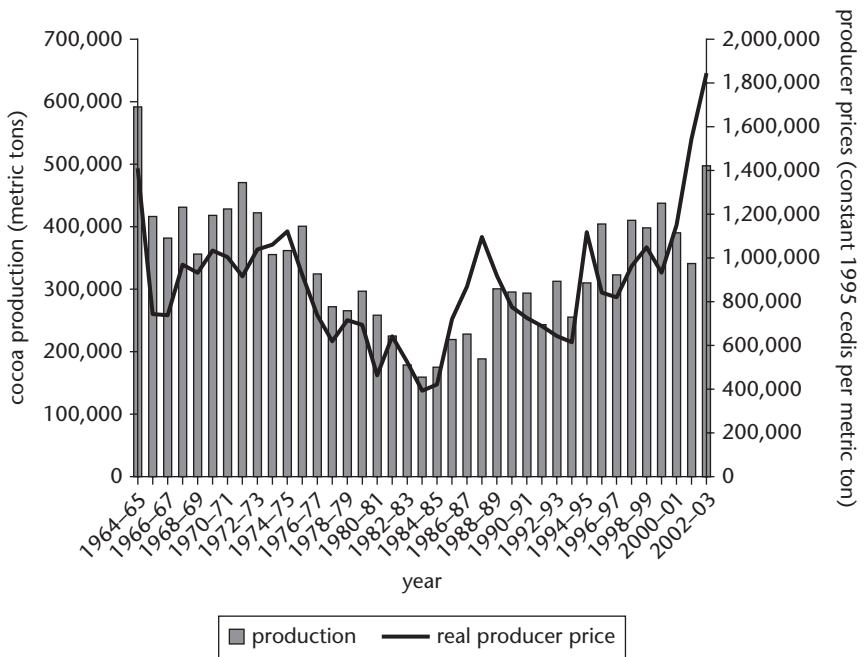
Production dropped from an average of 450,000 tons to a low of 159,000 tons in the 1983–84 growing season, when the crop was just 28 percent of the peak 1964–65 crop. Ghana's share of the world market fell accordingly, from 36 percent in 1965 to 17 percent in the early 1980s. It is worth noting that as a result of

strengthening world prices, export revenues remained steady initially, a factor that helped successive governments avoid painful reforms. The key sources of decline over the longer term were the overvalued exchange rate and high taxation, effected by means of a monopsonistic marketing board (Teal and Vigneri 2004). By 1983, cocoa farmers received only 21 percent of the fob price.

With implementation of the economic recovery program in the mid-1980s, agricultural policy focused on improving the terms of trade for cocoa. Producer prices rose in part because the government raised the farmer's share in cocoa earnings to 40 percent by 1995 and to 50 percent by 2001 (AfDB 2002). In addition, falling inflation helped boost real producer prices. By 1988, real producer prices had increased threefold from their low in 1984. Producer prices were also strengthened by squeezing COCOBOD's share in cocoa revenues from 30 percent to 15 percent of the fob price. While the share of the producer price in the world price has fluctuated in recent years, the real producer price has increased steadily, helping to raise COCOBOD purchases and exports (figure 15.1).

Efforts to improve the efficiency of COCOBOD led to wide-ranging changes in its structure and activities. Transport of cocoa shifted to the private sector after

Figure 15.1. Cocoa Production and Producer Prices, Ghana, 1964–2002



Source: Ghana Cocoa Board (www.cocobod.gh).

1984, while responsibility for cocoa feeder roads shifted to the Ministry of Roads and Highways. A cocoa rehabilitation project was initiated in 1987 with donor funding (AfDB 2002). From 1989, COCOBOD began phasing out input subsidies, which led to a substantial increase in input prices over a relatively short period of time. However, following pressure from farmer organizations, the government reduced the price of insecticides and fungicides in 1994.

It was not until after the 1992 elections that reform of COCOBOD gained momentum. Major changes were a reduction in staff levels from more than 100,000 in the early 1980s to 10,400 in 1995 and to just over 5,100 staff by 2003, an end to input marketing, and the introduction of competition into internal marketing. Licensed buying companies were set up to compete with the state-owned Produce Buying Company. By 1996, the public company's share of purchases had declined to 80 percent and by 2001 to 37 percent. Monopsonistic price setting by COCOBOD remains in place.³ Liberalization of COCOBOD's export monopoly started in 2001, and licensed buying companies can now export 30 percent of their cocoa purchases directly to external buyers. However, a minimum tonnage requirement has meant that only nine of the companies qualified, and none actually marketed externally.

The reforms had an impact. In 2004, the cocoa sector accounted for 7.8 percent of GDP and contributed 21 percent of exports. Strong growth in the cocoa sector resulted primarily from government assistance and favorable weather conditions. The former included free mass spraying of cocoa farms, which reduced the incidence of pests and diseases, especially black pod, swollen shoot disease, and capsid insect attack; a steady increase in the farmer's share of the export price; rehabilitation and replanting of old farms with new varieties; and road rehabilitation work in cocoa-growing areas, which facilitated transport and reduced costs (USDA 2005; ISSER 2005). The public dissemination of higher-productivity, faster-maturing tree varieties played an especially important role in helping farmers respond to the new policy environment (Edwin and Masters 2005).

The growth of Ghanaian cocoa exports also reflected the influx of cocoa smuggled from Côte d'Ivoire, partly as a result of that country's civil conflict. The inflow is estimated to have been between 120,000 and 150,000 metric tons in 2004. However, cocoa from Côte d'Ivoire is of inferior quality, and the smuggling may have contributed to a fall in the premium that Ghanaian cocoa receives—typically between \$50 and \$80 a ton—to about \$20 a ton. Maintaining quality is the responsibility of the COCOBOD's Quality Control Division, which carries out inspection, grading, and sealing of cocoa for the international and local markets.

Of increasing economic importance are exports of processed cocoa products, in particular cocoa butter, liquor, powder, and cake. In 2005, Ghana had a processing capacity of 145,000 metric tons, and export earnings from these products tripled between 1992–94 and 2002–04, from \$32 million (about the level achieved in the early 1970s) to \$102 million (FAO 2008).

The government's policy with regard to producer prices is to reach a level of 70 percent of the world price. Price distortions persist partly because producer prices are not allowed to adjust quickly in response to upward movements in world prices. Cocoa supply is expected to increase gradually, especially if price incentives are coupled with improved husbandry techniques, pest control, and adequate transportation infrastructure. The ability of licensed buying companies to generate competition has yet to be determined. Seini (2002) reports that these companies rarely pay more than the government producer price. Moreover, their role in the export market is limited by their inability to operate beyond a minimum scale. However, support for full liberalization of the sector is also limited by concerns over quality—an issue in which both producers and buyers have a stake.

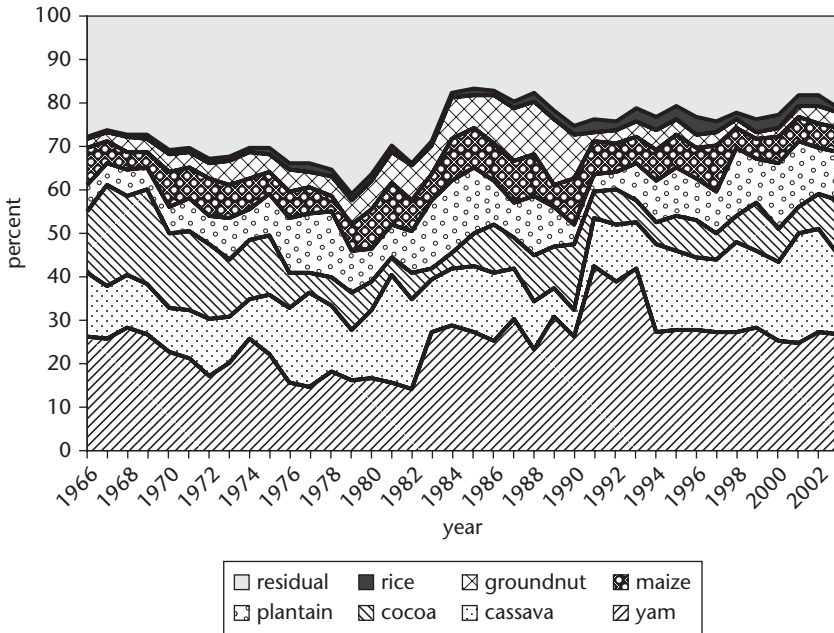
Measuring Distortions to Agricultural Incentives

It is clear from this discussion that government policies have had a strong impact on the price incentives facing producers in Ghana. This section assesses the extent of those price distortions over the past half century. Our focus is on government-imposed distortions that create a gap between actual domestic prices and the prices that would have existed under free markets (see Appendix A in this volume and Anderson et al. 2008). Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions facing nonagricultural producers for comparative evaluation. More specifically, this study computes a nominal rate of assistance (NRA) for farmers. It also generates an NRA for nonagricultural tradables, which can be compared with the rate for agricultural tradables through the calculation of a relative rate of assistance (RRA).

Price distortions are measured for four tradable crops: cocoa, rice, maize, and groundnuts. The presence or absence of support for three nontraded or lightly traded staples (cassava, plantains, and yams) is assessed as well. Collectively, these seven crops account for more than 70 percent of the value of agricultural production in Ghana (figure 15.2).⁴

The net trade positions of these commodities are diverse. Cocoa is Ghana's main agricultural export; rice is the main imported food commodity; maize has traditionally been imported, but there was an exportable surplus in some recent years; and groundnuts were for many years not traded internationally but became a significant export in the 1990s. Cocoa, rice, and maize were included in Stryker's analysis, which considered the period up to 1985 and found evidence of extensive distortions in all three sectors.

Figure 15.2. Composition of Farm Production at Distorted Domestic Price, Covered Products, Ghana, 1966–2003



Source: Compiled by the authors using FAOSTAT producer price and quantity data.

The cocoa sector was heavily mismanaged, and only a minor share of the export price was returned to the producer. COCOBOD’s share of export earnings declined somewhat in the 1990s, but as cocoa prices strengthened in the early 2000s, that share rose again. Export tax payments made by COCOBOD to the government declined from an average of 40–50 percent of fob earnings during the mid-1990s to less than 10 percent by 2004. This decline further allowed COCOBOD to increase its retained share of the export price, with the result being a much milder reduction in the implicit taxation of the Ghanaian producer (Brooks, Croppenstedt, and Aggrey-Fynn 2007, appendix figure 6).

Before the mid-1980s, rice producers received less than the imported price (at the farmgate) suggesting some implicit taxation, while maize producers’ prices were at a similar level to imported prices (again, compared at the farmgate). In both cases, domestic prices increased sharply in the mid-1980s, but the degree of price protection to producers since diminished to levels somewhat higher than the statutory import tariff of 20 percent. The evidence for rice and maize thus points to significant protection of import-competing commodities. In the case of groundnuts, the product became a significant export in recent years, and producers received slightly less than the export fob price (Brooks, Croppenstedt, and

Aggrey-Fynn 2007, appendix figures 7 and 8). There is no evidence of direct policy interventions in the markets for staples such as cassava, plantains, and yams.

These observations are reflected in table 15.2, which shows NRAs for the four tradable crops computed at an estimated “equilibrium” exchange rate. Protection for import-competing crops (rice and maize) declined in the second half of the 1990s but reemerged in the early 2000s.⁵ Disprotection (that is, taxation) of exports of cocoa beans declined steadily until the latter 1980s. Further reforms through the 1990s lowered the rate of implicit export taxation to less than 20 percent.

Figure 15.3 shows that history back to 1955 but groups products according to their net trade status.⁶ Importable crops were effectively taxed before the economic collapse of the early 1980s. From the period of adjustment until the 1992 elections, significant protection was provided, with the NRA averaging more than 60 percent. This protection was mostly dismantled in the 1990s, but those reforms were not secured. Exports of cocoa beans were heavily taxed in the years between independence and the crisis that precipitated reforms and adjustment (1958 to 1982). The tendency to tax exportables diminished over time but remained significant, with an NRA averaging close to -20 percent in the period 1995–2004. When nontradables are factored in, the overall pattern is one of very low net taxation of agriculture before independence in 1957, heavy net taxation in the period after independence, and an overall balance declining to almost zero in recent years. This net balance masks a consistent tendency to tax exports and protect imports.

For much of the postindependence period, exchange rate distortions had an important impact on producers’ incentives. Based on the assumed equilibrium exchange rate, the cedi was overvalued by 13 percent between 1958 and 1982, with the degree of overvaluation falling to 8 percent between 1984 and 1992. Overvaluation taxed producers of exportables and increased the degree of price protection provided through quantitative restrictions to import-competing products. In the case of cocoa beans, exchange rate overvaluation accounted for a significant share of implicit taxation before 1992. For import-competing products, the net taxation before the crisis would have been more severe but for overvaluation, while some of the high protection provided between 1984 and 1992 is explained by overvaluation. From 1992 onward, the foreign exchange market functioned freely, so the NRA estimates reflect direct sector-specific distortions.

Continued protection of nonagricultural sectors has reinforced the discrimination against exportables throughout the period analyzed and provided disincentives for producers of nontradables. Nonagricultural protection also added to the bias against import-competing products in the period before the crisis, when they were effectively taxed, and dampened the degree of protection provided in subsequent years. These impacts are reflected in the differences between the NRAs and RRAs (table 15.3) and are illustrated in figure 15.4.

Table 15.2. NRAs for Covered Farm Products, Ghana, 1955–2004*(percent)*

Product indicators	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84 ^a	1985–89	1990–94	1995–99	2000–04
Exportables ^{b,c}	-14.1	-23.7	-57.3	-49.6	-80.9	-83.2	-56.6	-36.2	-19.4	-19.6
Cocoa	-14.1	-23.7	-57.3	-49.6	-80.9	-83.2	-56.6	-36.2	-30.9	-21.7
Import-competing products ^{b,c}	-12.1	-10.4	-13.6	0.3	0.1	40.2	69.4	33.2	13.2	35.8
Rice	-6.3	-27.9	-36.9	-15.1	-21.3	26.6	79.6	21.7	10.9	30.9
Nontradables ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cassava	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plantains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mixed trade status ^b										
Maize	-14.2	-4.1	-1.3	6.7	21.3	56.2	66.1	38.5	3.8	39.0
Groundnuts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	-14.7
Total of covered products ^b	-7.0	-13.5	-28.2	-23.0	-41.0	-32.5	-8.3	-3.1	-4.6	-2.4
Dispersion of covered products ^d	11.4	19.4	30.2	29.0	47.9	69.6	56.3	26.2	17.2	25.5
Percent coverage (at undistorted prices)	73	73	74	69	66	71	82	77	78	80

Source: Data compiled by the author.

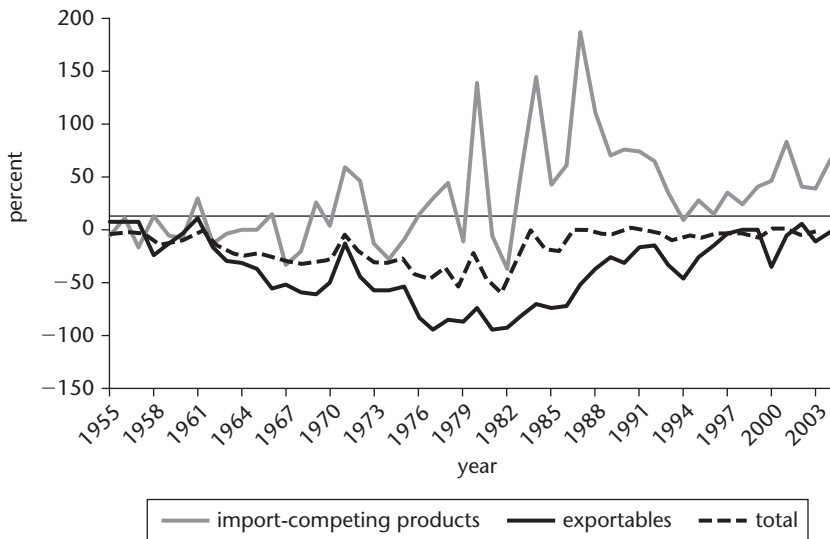
a. Data for 1983 are omitted because they are unreliable.

b. Weighted averages, with weights based on the unassisted value of production.

c. Mixed trade status products included in exportable or import-competing groups depending on their trade status in the particular year.

d. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

Figure 15.3. NRAs for Exportable, Import-Competing, and All Farm Products, Ghana, 1955–2004



Source: Data compiled by the authors.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontaxable products and non-product-specific assistance are also included.

The final rows of table 15.3 show what the key indicators would be had exchange rate distortions not been taken into account. Those numbers reinforce the point that the exchange rate distortions contributed very significantly to agriculture's overall negative NRA and to the negative RRA from the 1960s to the 1980s.

Market deficiencies affecting the agricultural sector

Ghana's agricultural sector also suffers heavily from implicit distortions in the form of market underdevelopment. In particular, transport costs are high (prohibitively so for many small-scale farmers with a potential surplus to sell), while credit is expensive, with formal interest rates of 25 percent or more, and effectively unavailable for most producers without established links to international markets. Moreover, there are few signs of improvement in Ghana's social infrastructure and in the development of human capital. In the early 2000s, less than 18 percent of the country's roads were paved and their condition had deteriorated over recent

Table 15.3. NRAs for Agriculture Relative to Nonagricultural Industries, Ghana, 1955–2004
(percent)

Indicator	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84 ^a	1985–89	1990–94	1995–99	2000–04
NRA, covered products	-7.0	-13.5	-28.2	-23.0	-41.0	-32.5	-8.3	-3.1	-4.6	-2.4
NRA, noncovered products	2.7	3.2	3.6	3.2	3.5	3.2	3.4	2.7	2.6	2.6
NRA, all agricultural products	-4.4	-9.0	-19.8	-14.9	-25.6	-21.2	-6.3	-1.7	-3.0	-1.4
Trade bias index ^b	-0.22	-0.34	-0.59	-0.53	-0.79	-0.84	-0.69	-0.46	-0.32	-0.37
NRA, all agricultural tradables	-9.3	-16.6	-38.8	-28.9	-50.2	-39.9	-17.3	-5.7	-8.8	-3.3
NRA, all nonagricultural tradables	3.7	1.5	-0.3	2.7	-5.5	-0.1	1.0	3.8	3.4	5.2
RRA ^c	-12.5	-18.0	-38.4	-30.8	-47.5	-39.3	-18.7	-9.2	-11.7	-8.0
Memo item, ignoring exchange rate distortions:										
NRA, all agricultural products	-3.4	-1.1	-8.6	-10.6	-8.2	-0.7	-0.7	-1.4	-2.9	-1.4
Trade bias index ^b	-0.19	-0.11	-0.22	-0.39	-0.42	0.05	-0.53	-0.44	-0.31	-0.37
RRA ^c	-10.9	-6.2	-21.9	-25.4	-24.5	-5.4	-7.3	-8.5	-11.6	-8.0

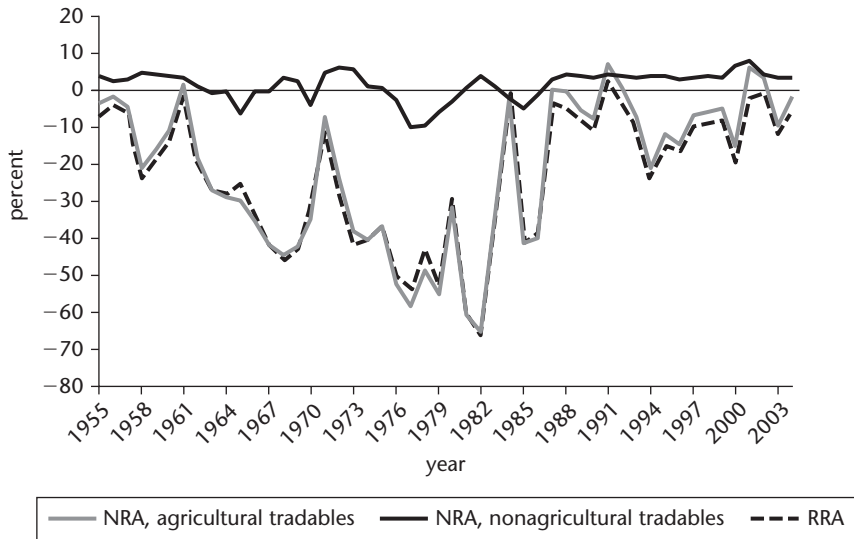
Source: Data compiled by the authors.

a. Data for 1983 are omitted because they are unreliable.

b. Trade bias index is $TBI = (1 + NRA_{ag,x}/100)/(1 + NRA_{ag,m}/100) - 1$, where $NRA_{ag,m}$ and $NRA_{ag,x}$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

c. The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 15.4. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Ghana, 1955–2004



Source: Data compiled by the authors.

Note: For a definition of the RRA, see table 15.3, note c.

years (World Bank 2006b), while the country's railway network was almost non-functional (OECD 2003).

One positive development for farmers is the advent of mobile phone use, with usage increasing from 6.6 users per 1,000 population in 2000 to 78.2 per 1,000 in 2004. Health and education show few signs of improvement. Public health expenditures declined from 1.9 percent of GDP in 2000 to 1.4 percent in 2003 (World Bank 2006a). Male and female literacy improved somewhat since the early 1980s, but the rate of improvement has stalled, and concerns have been raised about the quality of both primary and secondary education and the particularly low rate of primary school enrollment in northern rural areas.

The determinants of policy changes

Before the adoption of liberalizing reforms in 1983, any attempts by the government to influence farmers' incentives through price policy were ineffective, because the available policy instruments could not offset the huge distortions deriving from the conjunction of high inflation and a fixed exchange rate. Accordingly the government tried to influence the allocation of resources through

import licensing, exchange controls, marketing board operations, input distribution, and the direct allocation of credit. The government also spent heavily on projects and public investments. This policy environment created enormous scope for arbitrage between informal markets and formal, government-controlled channels and led to rent seeking on a massive scale.

The importance of political connections in the pre-1983 environment led to a strong bias in favor of large farmers with contacts and influence. As Stryker put it, “government regulations were subverted, graft and corruption were rampant, and patron-client relations became entrenched as the principal means by which most people could gain access to scarce goods and services” (Stryker 1991, p. 116). Rawlings came to power as a populist leader dedicated to cleaning up government, but his attempts to reduce rent seeking were counterproductive because they did not deal with the fundamental problem of distorted incentives. Once a decision was made to liberalize the economy and reduce price distortions, however, the incentives for rent seeking diminished.

From 1983 onward, the imperative was to resurrect the macroeconomy, and the government signed up to IMF and World Bank-led programs. International financial institutions thus played a key role in policy setting through the remainder of the 1980s, first through the economic recovery program and then through subsequent structural adjustment programs. National lenders, as joint underwriters of reform, also had significant input. While lenders and donors broadly supported the macroeconomic tenets of reform and adjustment, they had a specific interest in ensuring that money was spent on worthwhile projects and public investments. This meant additional focus on the microeconomics of development policies, as well as macroeconomic distortions and price incentives.

An increasing focus on microeconomic incentives coincided with a refinement of orthodox policy thinking in the 1990s, with undistorted price signals seen as a necessary but by no means sufficient prerequisite for economic development. Outside the international financial institutions, a number of lenders and non-governmental organizations started to argue for a fresh look at infant industry arguments for agricultural protection in developing countries. However, until recently donors consistently neglected agriculture. The need to devote more resources to agricultural development has been formally recognized, but that has so far not been reflected in foreign aid flows.

In contrast to the World Bank and IMF, the World Trade Organization (WTO) has had little direct impact on policy in Ghana. As a signatory to the General Agreement on Tariffs and Trade, Ghana was a founding member of the WTO and acceded with “least developed country” status. Accordingly, it established ceiling bindings of 99.5 percent on agricultural tariffs. Ghana’s highest applied rate now stands at 20 percent, and there is little reason to expect tariffs to be constrained by the ceilings at this time.

Policies in Ghana have never been fully liberalized, but after the most profound policy distortions were removed and the economy recovered, the pace of growth—and associated poverty reduction—has been disappointing compared with the experience of other developing countries outside Africa. Two alternative views of the situation reflect a controversy about the policies needed to stimulate growth in Africa more generally. One posits that liberalizing reform needs to be pushed through all the way but accompanied by more effective policies to facilitate adjustment and improve competitiveness. The other contends that the process of liberalization itself should be addressed selectively and with circumspection. While the experience of massive intervention left such policies totally discredited, there is a divergence of views, both within Ghana and among donors, on the direction that policy should now take.

In agriculture, Ghana's experience with its most recent agricultural development and poverty reduction strategies, and their associated review mechanisms, illustrates the difficulty of achieving consensus among stakeholders when few of those stakeholders hold to ideological certainties. One important issue is that agriculture is affected by policies in other sectors, where reforms have also lost momentum. In particular, further reforms to financial markets could help increase the flow of credit into the farm sector.

Prospects and Policy Options

Ghana's major current challenge is to choose appropriate investments that can raise productivity and growth from the 4–5 percent of the last 25 years to the 6–8 percent target set out in the poverty reduction strategy. In the 50 years since independence, Ghana's economic growth has been circumscribed by currency overvaluation, excessive state interventions, excess demand (and repeated painful adjustments), discrimination against sectors in which the country holds a comparative advantage (notably cocoa), and suppression of the financial sector. Of these problems, the first two—heavily emphasized in Stryker's examination of Ghana's trade, exchange rate, and agricultural policies through the mid-1980s—have essentially been resolved. Progress on the latter three has been positive but more fitful. In short, Ghana has not fully addressed the policy deficiencies that have constrained growth for half a century. On the other hand, the transition to a stable democracy has made policy making a more transparent and consistent process, itself a major accomplishment.

The current study shows that policy biases have been reduced but not eliminated: import-competing producers continue to receive significant protection, and COCOBOD continues to extract significant rents from farmers. However, there appears to be little appetite for fully eliminating distortions, because of concerns about the ability of farmers to compete and about the implications of

further tariff reductions for government revenue. Greater emphasis is attached, arguably with good reason, to boosting investments that can address structural weaknesses and thereby improve competitiveness and reduce poverty.

A difficulty with the investment-oriented approach—and one identified in the assessment of the government's 2003 agricultural development program—is that policies that improve competitiveness generally may not be pro-poor, either because they are geared toward the most viable farmers or because they intensify competitive pressures and the gap between modern commercial producers and traditional farmers. Thus, current policy debate, as in many other African countries, revolves around how to reconcile structural adjustment with poverty reduction.

Some broad principles should be able to guide policy design in Ghana. First is a need to address the structural weaknesses that impede development. These include a weak manufacturing sector, including in agriculture-related industries such as food processing, and a lack of outward orientation in potential export sectors. These weaknesses derive in part from deficient investment in public goods, such as transport systems and education and training, and from market failures that are inherently correctable (for example in the financial sector). Agriculture is also plagued by specific structural problems, including small and fragmented agricultural land holdings, weak organization at the farm level (notably a lack of grassroots institutions), unsuitable technologies, and a dearth of agricultural lending. These are key areas where government intervention, specifically to correct market failures, could be of benefit. The importance of, indeed the relevance of, eliminating Ghana's outstanding policy distortions needs to be seen in the context of these broader strategic needs.

Notes

1. The value of assistance under the Heavily Indebted Poor Country Initiative was about half that of loans and grants in 2002–03.
2. In 1983–84, farmers were provided with seedlings to replace trees lost in the drought and trees more than 30 years old (about one-quarter of all trees).
3. Cocoa producer prices (and related rates and fees in cocoa purchasing and marketing) are fixed by the Producer Price Review Committee, made up of representatives of the cocoa farmers; licensed cocoa buyers; cocoa haulers; the Ministry of Finance (the minister of finance is the chairman of the committee); the Bank of Ghana; the Institute of Statistical, Social, and Economic Research of the University of Ghana, Legon; and COCOBOD officials.
4. For rice and maize, international reference prices are converted into local currency at the black market exchange rate on the assumption that importers must obtain hard currency at that price. Note that maize was exported in some recent years, but by then the official and black market exchange rates had converged. Conversely, producers of cocoa beans and groundnuts are assumed to have been obliged to convert their foreign currency earnings into cedis at the official exchange rate but implicitly allowed to sell half their foreign currency earnings on the parallel market. To measure the extent of exchange rate distortions, and to gauge the sensitivity of the NRAs to the particular choice of exchange rate, all NRAs are computed at an estimated equilibrium exchange rate corresponding to a weighted average of the official and black market rates (see Anderson et al. 2008 for a discussion).

5. Maize was exported between 1996 and 1999. Given the absence of export subsidies, import protection was therefore redundant in these years.

6. Data for 1983 are dropped from the analysis. In this year, the economy and trade collapsed, and domestic and international price comparisons are not reliable.

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NIGERIA

*Peter Walkenhorst**

Nigeria is a major player in the developing world. The federal republic, with its 140 million people, is the largest country in Africa and ninth largest in the world. It is also one of the world's top-10 petroleum exporters, and its proven reserves would allow Nigeria to sustain current oil export levels for at least another 25 years. Within Sub-Saharan Africa, Nigeria's gross domestic product is second only to South Africa's and is bigger than that of the other 14 members of the Economic Community of West African States (ECOWAS) combined. Nigeria also used to be a formidable agricultural exporter. Up to the mid-1960s, the country's share of world agricultural exports was more than 1 percent. Nigeria had a leading position for several of its export crops, supplying more than half of all traded palm kernel, more than one-third of all groundnuts, and more than one-fifth of all palm oil. However, agricultural exports collapsed as the economy shifted toward petroleum exploitation, and by the mid-1980s, Nigeria's world market share for agricultural products had dwindled to less than 0.1 percent. None of the country's export crops, with the exception of cocoa, commands any significant world market share.

The poor performance of Nigerian export agriculture was to a considerable extent the result of changes in incentives facing farmers. Public neglect of agricultural infrastructure, erratic changes in agricultural policies, and distortions in the exchange rate regime combined to create an economic environment that hampered agricultural producers while at the same time burdening consumers with high food prices. More than half of all Nigerians lived on less than \$1 a day in the

* The author is grateful for helpful comments from Kym Anderson, John Baffes, Simeon Ehui, Marianne Kurzweil, William Masters, and Ernesto Valenzuela. Detailed data and estimates of distortions reported in this chapter can be found in Walkenhorst (2007).

early 2000s (FOS 2005), and the poverty incidence exceeded 60 percent in rural areas, where people overwhelmingly depend on agricultural activities for their livelihood. Hence, getting agricultural incentives right is of utmost importance not only for fostering economic development and growth but also to fight poverty directly.

To increase the efficiency of government interventions that can foster agricultural development and poverty reduction, policy makers need detailed information on the effectiveness of past policies. The indicators of policy distortions reported in this study aim to contribute to a better understanding of the direction and magnitude to which policy instruments have affected incentives facing agricultural producers and food consumers over the past 50 years. In particular, the distortion indicators attempt to measure the divergence between the price actually paid to the agricultural producer and the price that the farmer would have received in a distortion-free policy environment.

The findings indicate that policies toward agricultural producers have shifted significantly over time, with support to agricultural producers first declining after the country's independence, then increasing between the mid-1970s and the mid-1980s, before moving toward an incentive-neutral stance. The sectoral averages hide large support differences across commodities, however. Export commodities have consistently been explicitly or implicitly taxed, while import-competing commodities have benefited from producer support through tariff and nontariff barriers and, to a lesser extent, budgetary payments. In this context, recent policy reforms toward greater regional and global trade integration promise to remove the remaining antitrade bias and provide producers with a more market-friendly policy environment.

The remainder of the discussion begins with an overview of economic developments and structural changes in Nigeria. The agricultural policies that were pursued during the colonial period are briefly discussed before greater detail is provided on agricultural and food policies since the country's independence in October 1960. That sets the stage for presenting quantitative indicators of producer support and taxation and discussing the underlying policies. The final section reflects on prospects for more agricultural and trade policy reform.

Economic Performance over Time

Nigeria's long-term economic performance has been lackluster. Between 1950 and 2004, gross domestic product (GDP) per capita increased on average by a mere 1.1 percent per year. Similar to the general trend in Africa, economic growth fell well short of the economic expansion in other developing regions such as East Asia and Latin America and was only half as vigorous as worldwide growth.

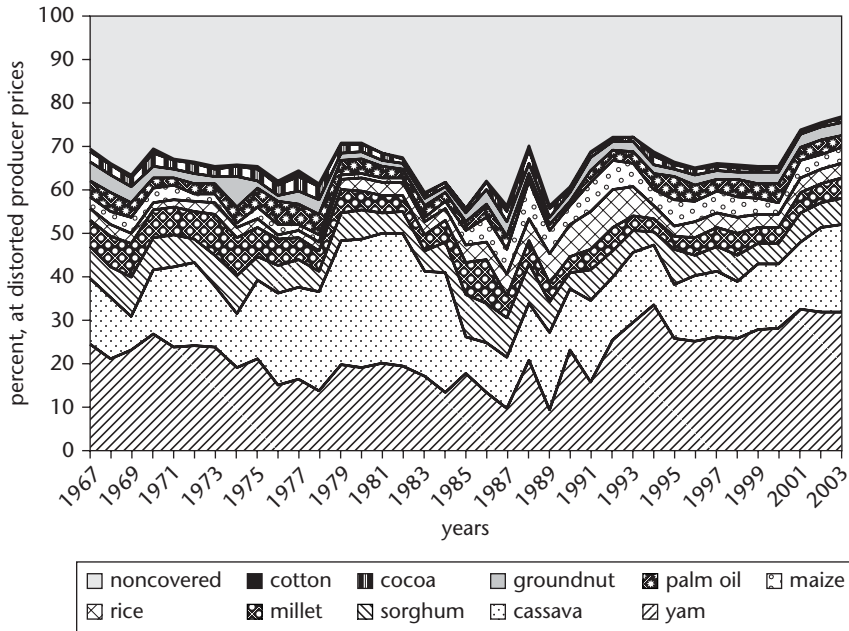
The poor long-term performance results partly from the strong economic contractions that Nigeria experienced first in the run-up to and during the Biafran war (1967–70) and then during the post-oil boom period in the early 1980s, when rigid economic policies hampered adjustment to lower oil prices and higher interest rates (Pinto 1987). Ultimately the country pursued a structural adjustment program (1986–94), which was sponsored by the International Monetary Fund and the World Bank, to stabilize the economy and put it back on a growth path. The return to a democratic government in 1999 further set the stage for greater market orientation, and a number of fundamental economic reforms have been initiated since 2003, such as the accelerated privatization of state enterprises and the reduction of trade barriers.

Before independence and up until the late 1960s, Nigeria's economy was dominated by agricultural activities in terms of the sector's contribution to national GDP, employment, and exports. But the discovery and commercial exploitation of petroleum soon led to a fundamental structural transformation of the economy. Between the mid-1960s and the mid-1970s, the share of value added generated by the agricultural sector fell by almost half, to less than 30 percent, while the corresponding share of the fuels and mining sector expanded. The contribution of manufacturing to aggregate value added doubled to almost 10 percent by the early 1980s but then fell back to 5 percent in the 1990s. The services sector gained in relative importance in the early years after independence but peaked at 45 percent in 1970. By the late 1980s, the share of services in aggregate value added had declined below the 30 percent share that had prevailed in the early 1960s.

The growth of the petroleum sector at the expense of other parts of the economy, notably agriculture, is mirrored in other economic indicators. In particular, the relative importance of agriculture as an employer started to decline markedly in the early 1970s, and by the early 2000s, the sector's share in total employment had halved. The most dramatic change, however, occurred with respect to Nigeria's export structure. Until the mid-1960s, agricultural exports accounted for more than 70 percent of total merchandise exports, but this share had dwindled to less than 5 percent a decade later and has never recovered.

Within agriculture, some shifts in the pattern of production over time have been notable. Livestock production expanded almost continuously after Nigeria's independence, while crop output dropped during the 1970s and early 1980s when the economy switched toward petroleum exploitation. Because of the predominant importance of crops for feeding the growing population, domestic production of food per capita declined markedly. Subsequently, crop output and food availability outpaced the growth of the population, and since the early 1990s, the food per capita ratio has surpassed the level that prevailed at the time of independence.

Figure 16.1. Composition of Farm Production at Distorted Producer Prices, Nigeria, 1967–2003



Source: Compiled by the author, based on FAO (2006) data.

The long-term growth of agricultural output was driven mainly by root crops. Production of cassava has more than quadrupled since the early 1960s, and the output of yams increased nearly sixfold. In contrast, most cereals and traditional export crops, such as cocoa, groundnuts, oil palm fruit, showed below-average production growth. As a result, cassava and yams now account for more than 50 percent of the total value of Nigeria’s agricultural production (figure 16.1).

Policies before Independence

During the colonial period, Nigeria’s economy was largely geared toward exports of agricultural raw materials. British administration in the country formally began in 1861, when Lagos became a crown colony, and by 1906, present-day Nigeria was under British control. The administration built a railroad network and constructed roads at an accelerating rate after the 1930s. These infrastructural investments, along with the introduction of the pound sterling as the universal medium of exchange, facilitated export trade in cocoa, cotton, groundnuts, and palm oil (Wells 1974). Most of this trade occurred directly with Britain: as late as

1955, 70 percent of Nigeria's exports were destined for the home market of its colonial power, and 47 percent of its imports originated in Britain.

Three periods during the colonial era can be distinguished (Helleiner 1966). The first of these is the period of rapid and sustained export growth from 1900 to 1929, the second is the period of depression and wartime regulation during 1930–45, and the third is the period of slow recovery between 1945 and independence in 1960. Governmental involvement in agricultural production increased markedly during World War II—marketing boards pegged the prices of agricultural commodities below the world market rate, workers faced wage ceilings, traders encountered price controls, and Nigerian consumers experienced shortages of imported goods.

After 1945, agricultural prices recovered and export growth resumed. The government's role in the economy shifted from strict control to fiscal management. The centralized single-commodity wartime marketing boards were transformed into regional multicrop organizations in 1954 (Oyejide 1986a), and the share of government expenditure in GDP increased from 3.4 percent in 1950 to 6.2 percent in 1962. Capital expenditure increased notably, but the funds were allocated mostly to social services, transport, and communication, while industry and agriculture received less than 10 percent of the investment budget. Moreover, the funds that went into agriculture were focused on improving and enhancing export agriculture; public authorities devoted little attention to subsistence crops and their producers, so the majority of Nigerian farmers did not benefit from the governmental spending programs.

Incentives and Disincentives to Agriculture

Since independence, agricultural policy in Nigeria has been characterized by instability and inconsistency. Frequently changing governments tried to make their mark by adopting entirely new policies and programs, so many initiatives were formulated and scrapped in rapid succession. There was generally a lack of focus on effective implementation, with the result that many policies were undermined by bureaucratic inertia, poor management, and corruption. Moreover, inadequate institutional arrangements for policy and program coordination often led to duplication of effort and inefficient resource use among agencies and ministries of the same government, between federal and state agencies, and between agencies located in different states.

Four distinct phases of agricultural policy making can be distinguished (Manyong et al. 2003, World Bank 2006b, Daramola et al. 2007). During the 1960s, governments continued to pursue an export-oriented, *laissez-faire* attitude toward agriculture. Public policy remained largely confined to agricultural

research, extension, and export crop marketing, with most activities and institutions being regionally based. Agriculture was the country's major foreign exchange earner and an important source of fiscal revenues through export taxation. The end of the decade saw a marked contraction in export agriculture, but this development was initially seen as temporary and related to the Biafran war.

After the end of that war, and in the face of the persistent decline in agriculture, the policy paradigm changed fundamentally: during the second phase, which spanned 1970 to 1986, heavy governmental intervention in the agricultural sector became the norm. There was a feeling that the increasingly serious problems of agricultural production and food supply required strong governmental engagement, including from federal authorities. The emerging inflows of fiscal resources from oil exports provided the government with the financial means to launch a multitude of agricultural policies, programs, projects, and institutions. Major new initiatives included the elimination of export taxes, the reduction of import tariffs on agricultural inputs, the establishment of national commodity boards to administer guaranteed minimum prices, the provision of substantial subsidies for fertilizer use and other farm inputs, and the launch of agricultural credit support schemes. These policies did not, however, yield the hoped-for benefits for agricultural development, and Nigeria evolved from a net exporter of agricultural crops to a large-scale importer of agricultural and food products during this period. Eventually, the high fiscal spending and prevalent state control proved unsustainable when revenues from oil exports plummeted, and government debt levels surged in the early 1980s.

The beginning of the third agricultural policy phase coincided with the launch of economy-wide structural adjustment reforms, as a result of which government largely withdrew from directly controlling production activities. Government expenditure was cut back, subsidies and price controls were withdrawn, and input and output marketing activities were liberalized. The currency was devalued with a view to strengthening the price competitiveness of export commodities and import-competing goods. Moreover, trade policy reforms were implemented with the aim of diversifying the production and export base (for example through non-fuel export subsidies) and increasing the country's self-sufficiency for food and agricultural raw materials, including through import bans.

The fourth phase came about with the restoration of democracy in 1999 and has been marked by efforts to create a business environment that is conducive to greater private investment in the agricultural sector. A new agricultural policy strategy was published in 2001 that spelled out definitive responsibilities for the federal, state, and local governments in an effort to remove duplicated roles and overlapping functions. Greater control over policy implementation was exercised—for example, through a fundamental scaling back and reform of the

nonfuel export subsidy regime that had been undermined by corruption and fraud. Moreover, in October 2005, Nigeria adopted the ECOWAS common external tariff, which involved a substantial reduction in import duties, and reaffirmed the country's commitment to its regional partners to phase out the remaining special tariffs on sensitive products and quantitative import restrictions.

Methodology and data to measure agricultural distortions

Those four different policy phases presented producers with noticeably differing distortions to prices. Using the methodology outlined in appendix A of this volume and detailed in Anderson et al. (2008), this study estimates the nominal rate of assistance (NRA) to farmers. The main focus is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Hence, the analysis is based on the assumption that the economy of the country under scrutiny, in this case Nigeria, is small relative to the world market and hence that domestic policies do not influence international prices.

Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in nonagricultural sectors for comparative evaluation. More specifically, nominal rates of assistance are computed for farmers, including an adjustment for direct interventions in input markets, along with an NRA for nonagricultural tradables for comparison with that for agricultural tradables through the calculation of a relative rate of assistance (RRA).

The conversion of import and export parity prices to local currency is carried out at an equilibrium exchange rate that is estimated from the official rate and the proportion of export receipts traded on the parallel or sanctioned secondary market (when there were retention schemes for exporters) or the illegal (black) secondary market for foreign currency. In Nigeria, the institutional arrangements up to 1986 were such that all import and export transactions had to take place at the official exchange rate; since then nonfuel trade occurred at the free-market rate.

Unit border prices for imports and exports were obtained from trade volume and value data published in the Food and Agriculture Organization's database FAOSTAT. Information on domestic producer prices came from several different sources. Farmgate prices for 1982–2004 were obtained from the Nigeria's Federal Office of Statistics and (for cocoa and palm oil) from the Central Bank of Nigeria. Earlier information on producer prices was based on Oyejide (1986a) for 1961–62, Oyejide (1986b) for 1963–76, and Robertson (1983) for 1977–81. It should be noted that different sources sometimes report quite divergent price information, and the selection of the price data sources was undertaken with the

aim of using the same source across the largest number of commodities and years to minimize bias from differing reporting methodologies.

The available information on transport, marketing, and processing margins showed large variability over time, to the extent that differences in margins appeared to be caused by data problems rather than by underlying changes in cost structure. To minimize the impact of these data problems on the policy analysis, data on margins reported in Robertson (1983) for the late 1970s and early 1980s were averaged, converted to ad valorem equivalents, and taken as representative for the entire study period. The quality of domestically produced and consumed products was assumed to be identical to that of traded commodities.

A commodity was classified as an exportable if exports exceeded imports and accounted for more than 2.5 percent of domestic production. Conversely, if imports exceeded exports and accounted for more than 2.5 percent of domestic production, a product was classified as import-competing. Commodities were classified as (nontradable) home goods if neither exports nor imports accounted for 2.5 percent or more of domestic production. Multiyear averages were thereby considered to avoid frequent switches in the tradability status of a commodity.

A dominant share of the products not individually covered in the quantitative analysis are fruit and vegetables, which are rarely traded and thus qualify as home goods. Yet, about one-tenth of the value of the uncovered agricultural output in 2004 consisted of exportables, such as ginger, natural rubber, and cashew nuts. At the same time, about one-third of the value of uncovered agricultural production consisted of import-competing products, notably livestock products, wheat, and tobacco. The evolution over time of the value of exportables and import-competing products in the uncovered commodities group was assumed to follow the trend of the respective groups of covered products.

The shares of different nonagricultural sectors were derived from data on value-added in the World Bank's World Development Indicators database. In addition, it was assumed that the food industry and the beverage and tobacco industry, respectively, accounted for 20 percent and 2 percent of the total manufacturing value added, which corresponds to the sectors' employment share. Information on tariff protection for the different nonagricultural sectors was obtained from the UN Conference on Trade and Development's Trade Analysis and Information System (Trains) and the World Trade Organization's integrated databases.

Total governmental expenditure on agriculture at the federal, regional, and local level was assumed to amount to twice the federal government's spending on agriculture. Half of this amount was assumed to benefit agricultural producers through production-related subsidies, such as fertilizer subsidies. That part of the budgetary support is allocated across commodities in proportion to the production value of the commodity, while the rest is treated as non-product-specific assistance to farmers.

NRA patterns

The weighted average NRA for covered agricultural products (which account for about 70 percent of all farm products valued at undistorted prices) fell gradually from above 20 percent in the early 1960s to below 10 percent in the 1970s, then rose to 15 percent in the late 1980s before falling gradually over the 1990s as the structural adjustment program came into force; it then became negative on average in the early 2000s (table 16.1).

Throughout the past five decades, however, the dispersion of NRAs across the 10 covered products was huge. Even though the standard deviation in 2004 was only half what it was before the 1990s, it was still above 50 percent. That high intrasectoral variance in covered NRAs suggests the welfare cost of agricultural programs has been higher than might be implied by the relatively low average NRA for the sector.

In particular, while producers of import-competing crops, such as maize, rice, and sorghum have benefited from substantial governmental support ever since the independence period, the producers of traditional export crops such as cocoa beans, cotton, groundnuts, and palm oil have implicitly or explicitly been taxed by governmental policies in most years. This difference has narrowed over time, however, and the strong antitrade bias in the structure of Nigeria's agricultural distortions of the past has largely disappeared (see table 16.1; figure 16.2). Meanwhile, agricultural nontradables, namely, cassava, millet, and yams, have been subject to relatively little intervention, and their NRAs were close to zero until the introduction of the value added tax in 1994, after which they turned negative (see middle rows of table 16.1). The assumed NRA values for the roughly 25–40 percent of the agricultural sector's products not covered here do not alter the sectoral average NRA very much, nor does non-product-specific assistance except in the first half of the 1980s (see upper half of table 16.2).

RRA trends

Because of the low rates of assistance to nontradable farm products, and the large weights of them and of highly protected import-competing products within the farm sector (see figure 16.1), the NRA for tradable agricultural products is substantially higher than for the sector as a whole. It is also much higher than the NRA for nonagricultural tradables (which is dominated by petroleum; manufacturing is well under 10 percent of GDP). Hence from independence to the mid-1990s, the RRA is between 25 and 67 percent, suggesting that on average the price of tradable farm products relative to that for nonfarm tradables was inflated by policies by between one-quarter and two-thirds. The premium was slightly lower at one-fifth in the latter 1990s, and that difference had

Table 16.1. NRAs for Covered Farm Products, Nigeria, 1961–2004
(percent)

Product indicators	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Exportables ^{a,b}	-34.0	-48.6	-55.8	-49.1	-37.3	-49.5	-19.6	-10.5	-18.0
Cocoa	-35.1	-56.1	-48.9	-51.8	-22.1	-32.5	-4.5	2.6	-16.2
Cotton	-75.7	-66.9	-76.1	-71.7	-72.8	-75.3	-82.8	-82.7	-82.3
Import-competing products ^{a,b}	214.9	173.2	146.1	81.0	58.7	85.4	35.6	20.9	-9.5
Rice	64.7	21.1	37.3	28.5	49.4	66.5	11.1	-3.7	9.6
Nontradables ^a	0.2	0.3	0.6	1.3	2.7	0.9	-0.7	-4.8	-4.4
Cassava	0.3	0.4	0.7	1.5	3.2	1.0	-0.7	-4.8	-4.2
Millet	0.2	0.3	0.6	1.2	2.6	0.8	-0.7	-4.8	-4.4
Yams	0.2	0.3	0.5	1.0	2.2	0.7	-0.8	-4.8	-4.5
Mixed trade status ^a									
Maize	259.2	166.7	155.7	166.3	190.3	180.1	73.7	128.9	78.6
Sorghum	216.1	209.6	193.8	183.4	151.5	163.1	104.7	89.5	80.8
Groundnuts	-20.7	-45.5	-58.6	11.4	-30.1	5.6	-2.6	-43.6	-57.5
Palm oil	-24.9	-31.0	-44.2	-17.2	-25.3	-11.8	107.5	41.2	-12.6
Total of covered products ^a	21.1	12.2	7.3	5.3	7.8	14.8	4.2	-0.1	-5.4
Dispersion of covered products ^c	111.8	94.2	92.4	89.4	90.4	92.1	62.6	66.2	53.1
Percent coverage (at undistorted prices)	73	70	67	65	65	59	69	66	72

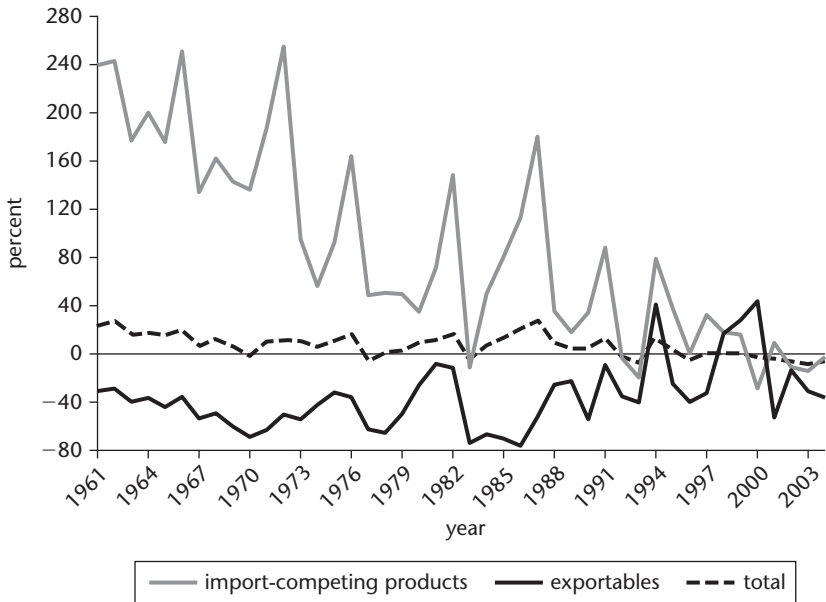
Source: Data compiled by the author.

a. Weighted averages, with weights based on the unassisted value of production.

b. Mixed-trade-status products included in exportable or import-competing groups depending upon their trade status in the particular year.

c. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

Figure 16.2. NRAs for Exportable, Import-Competing, and All Farm Products, Nigeria, 1961–2004



Source: Data compiled by the author.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

disappeared by the first half of the 2000s, suggesting that for the first time since independence, there was no longer an incentive to have more resources in agriculture than would be the case without product price distortions (table 16.2 and figure 16.3).

The final three rows of table 16.2 show what the agricultural NRA (including nontradables), the trade bias index, and the RRA would be if exchange rate distortions had been ignored. Because the three nontradable crops account for roughly half the value of farm production, it is not surprising that the exchange rate distortion does not have a large effect on the overall agricultural NRA. But it does have a significant effect on the RRA for tradables: if the exchange rate distortion had been ignored, the RRA would have still trended slightly upward before the 1980s and steeply down to zero after the 1980s, but the absolute size of the RRA would have been overestimated before the 1980s and underestimated since then.

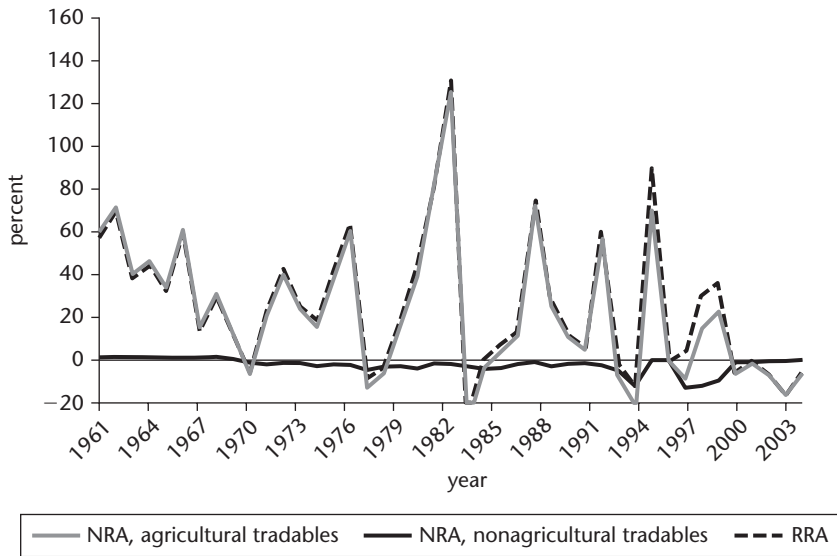
Table 16.2. NRAs for Agriculture Relative to Nonagricultural Industries, Nigeria, 1961–2004
(percent)

Indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRA, covered products ^a	21.1	12.2	7.3	5.3	7.8	14.8	4.2	−0.1	−5.4
NRA, noncovered products	17.9	9.4	2.3	2.1	1.1	−3.3	2.4	0.6	−9.3
NRA, all agricultural products ^a	20.3	11.3	5.7	4.1	4.5	6.9	3.5	0.1	−6.6
Non-product-specific (NPS) assistance	0.4	0.6	1.1	2.3	4.9	1.3	0.4	0.3	1.2
Total agricultural NRA ^b	20.7	11.9	6.7	6.3	9.4	8.2	3.9	0.4	−5.4
Trade bias index ^c	−0.79	−0.82	−0.81	−0.74	−0.66	−0.70	−0.45	−0.36	−0.04
NRA, all agricultural tradables	54.4	30.5	18.7	19.2	41.8	24.8	20.7	14.9	−7.5
NRA, all nonagricultural tradables	1.4	1.1	−1.7	−2.9	−2.9	−2.2	−6.2	−9.0	−0.5
RRA ^d	52.3	29.0	20.8	22.6	45.6	27.4	28.8	26.2	−7.0
Memo item, ignoring exchange rate distortions:									
NRA, all agricultural products	22.3	16.5	13.1	11.1	12.9	13.1	3.6	0.6	−5.5
Trade bias index ^c	−0.77	−0.76	−0.71	−0.53	0.00	−0.39	0.18	1.36	0.04
RRA ^d	57.7	41.6	39.1	35.0	53.0	41.7	21.2	15.5	−7.9

Source: Data compiled by the author.

- NRAs including product-specific input subsidies.
- NRAs including product-specific input subsidies and non-product-specific (NPS) assistance. Total of assistance to primary factors and intermediate inputs divided to total value of primary agriculture production at undistorted prices (percent).
- Trade bias index is $TBI = (1 + NRA_{agx}/100)/(1 + NRA_{agm}/100) - 1$, where NRA_{agm} and NRA_{agx} are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.
- The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 16.3. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Nigeria, 1961–2004



Source: Data compiled by the author.

Note: For a definition of the RRA, see table 16.2, note d.

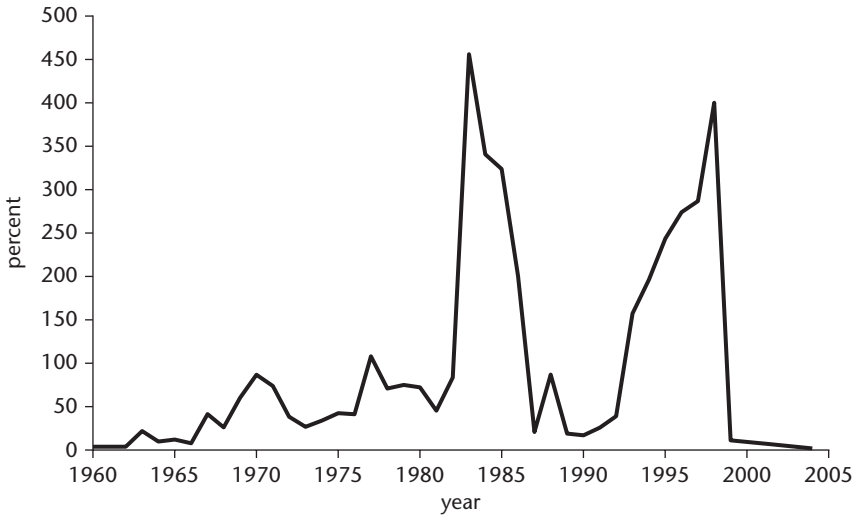
Factors Driving Policy Developments

The persistent divergence between domestic and world parity prices that is revealed in the agricultural NRAs for Nigeria can be attributed to several forms of governmental intervention including exchange rate policies, tariffs and quantitative restrictions on imports or exports and associated licensing requirements, and domestic market price supports and budgetary payments.

Exchange rate policies

Exchange rate policies have had a marked impact on agriculture. Nigeria has pursued a policy of maintaining a relatively constant nominal exchange rate in the face of strong real exchange appreciation stemming from petroleum-related capital inflows. The resulting real appreciation of the currency squeezed non-oil tradables, notably agricultural commodities. The opposite occurred when petroleum prices slumped in the mid-1970s and again in the mid-1980s.

Up to 1986, exporters were required by law to render all foreign currency to the central bank at the official exchange rate. Imports were subject to licensing requirements, and the government set annual quotas for “essential” and

Figure 16.4. Black Market Premium over Official Exchange Rate, Nigeria, 1960–2004

Source: Cowitt (various years).

“nonessential” imports. The difference between the official exchange rate and the black market rate was considerable during periods of overvaluation, with spikes of several hundred percent in the mid-1980s and mid-1990s (figure 16.4). The overvaluation served as an implicit impediment to producers of agricultural and other export crops. But insofar as importers had to pay more than the equilibrium price for foreign exchange, the regime also served as an implicit tax on imports and hence a form of protection to import-competing producers. Those implicit trade taxes have therefore been incorporated in the calculation of the NRAs for farm and nonagricultural sectors, using the project’s methodology (see Anderson et al. 2008).

Border taxation

After independence, Nigeria wholeheartedly embraced an import substitution strategy to foster industrialization. Manufacturing industries received high levels of protection through tariffs and quantitative restrictions, which had the effect of pushing up manufacturing wages and the costs of manufactured inputs to the detriment of other sectors, notably agriculture. Moreover, up to the mid-1970s, agriculture was seen as a reservoir for resources to support the process of industrialization.

For a long time, agricultural trade policy was primarily determined by balance of payment considerations. Import tariffs, export duties, and quantitative restrictions, such as import bans and licensing requirements, were used to adjust the level of imports to the available foreign reserves. Since the 1970s, tariff escalation, with high rates on finished products and lower ones on inputs, gradually took root, and tariff reforms in 1978 and 1982 introduced high import duties of 50 to 100 percent for food commodities such as maize, rice, wheat, and sorghum, while tariffs on production inputs and capital equipment were set in the range of zero to 15 percent (Oyejide 1986b). Tariffs on agriculture and food were very high in the 1990s (averaging 30 and 35 percent) and have been even higher since 2002, exceeding the import duties on primary nonagricultural and nonfood manufacturing, which averaged about 20 and 25 percent, respectively, in the 1995–2004 period.

Up until the mid-1970s, exports of agricultural produce were subject to taxation. In fact, they were taxed through three different means: export duties, sales taxes, and the marketing board surpluses (World Bank 1973). From independence to 1977, export duties levied by the federal government amounted to 15–20 percent. In addition, state governments levied, collected, and retained sales taxes based on the volume of produce delivered to the marketing boards.

The third form of export taxation consisted of the trading profits of the marketing boards, which have fluctuated considerably over time. The boards were the major instrument of agricultural commodity marketing and pricing policy since their establishment as regional, multicommodity organizations in 1954. Producers were required by law to sell their crops at officially determined prices to the boards, which were the sole exporters for the products covered. In 1977, the existing regional boards were replaced by six new national commodity boards responsible for the marketing of cocoa, groundnut, palm produce, cotton, rubber, and food grains (Manyong et al. 2003).

Domestic market price support

The creation of the grains marketing board in 1977 was particularly remarkable because it represented a first effort to extend the marketing board system to cover food crops. The National Grains Board handled maize, millet, sorghum, wheat, rice, and cowpeas. It administered a guaranteed minimum price policy whereby floor prices were nationally set for each of the six grain crops as guaranteed minimum prices at which the board would intervene as a buyer of last resort (Manyong et al. 2003). However, the official floor prices were set substantially below farmgate and retail prices and thus had little effect; because farmers were free to sell on the open market, the National Grains Board made very few intervention purchases (Oyejide 1986b).

Nontariff measures

Nigeria has made extensive use of nontariff barriers, notably import bans, to shelter domestic producers from foreign competition. The practice of prohibiting imports of selected products was widespread in the 1980s and early 1990s, and after the national government replaced a number of prohibitions with high tariffs from the late 1990s, major expansions in the list of prohibited imports occurred again in 2001, 2003, and 2004. In November 2005, 944 tariff lines (down from 1,130 lines in January 2004) were subject to import bans. In other words, nearly one-fifth of all products in the tariff schedule could not be legally imported into Nigeria. In addition, there were partial bans in 76 tariff lines, which mostly relate to imports of consumer durables in used form or prescribe minimum import quantities or specific import locations. Ruffer (2004) estimates that banned products might, in the absence of the prohibitions, account for 5–10 percent of total imports.

Frequent changes in trade regulations have also been harmful. For example, the 1988 ban on vegetable oil imports induced large-scale investments in domestic production capacity. When the ban was lifted four years later, the market was flooded with imports, and the uncompetitive domestic industry suffered losses.

In addition to the often unpredictable yet official barriers to imports in the form of tariffs and import prohibitions, substantial informal trade barriers in Nigeria's logistics sector add further distortions to the import regime. Importers face long clearance procedures, high berthing and unloading costs, erratic application of customs regulations, and corruption. A recent World Bank project collected information on the number of necessary documents and signatures as well as the time required to undertake import or export transactions. Nigeria scored worse than regional comparators in all dimensions (World Bank 2006a).

Budgetary payments

In addition to influencing producer prices, the government has also tried to foster agricultural development through direct spending policies. Public funds were made available to improve rural infrastructure and institutions and to subsidize production inputs, notably fertilizer, and agricultural credit. Public outlays for agriculture and rural development by federal, state, and local governments are reported by the authorities as recurrent and capital expenditure. Unfortunately, consistent and reliable data are available only for the approved budgets, not the executed ones. Also, a substantial part of actual spending has occurred through extrabudgetary means, such as "authorized to incur expenditure" arrangements and stabilization accounts (World Bank 1996). Hence, the available budgetary information can only be indicative of the support actually received by farmers.

The budgeted funds available for agriculture have fluctuated considerably over time, both in absolute outlays and in budget shares (Garba 2000). During the late 1970s and early 1980s, the federal government significantly increased its spending on agriculture; its share in the total budget exceeded 10 percent by 1983. During the subsequent structural adjustment period, the budget share fell back to an average of about 3.5 percent. This dropback was somewhat cushioned through continued agricultural loan assistance from international development partners, whose funding increased in relative importance, from one-tenth to one-quarter of federal outlays during the structural adjustment period (World Bank 2001).

In addition to spending at the federal level, state and local governments had their own spending programs, which frequently overlapped with federal initiatives. The relative importance of agriculture has varied widely across state budgets, ranging during the 1980s and 1990s from less than 1 percent to more than 10 percent, with most states, similar to the federal government, devoting the bulk of funds to capital improvements rather than recurrent expenditure (World Bank 2001). In contrast, local authorities, who support agriculture through funding programs for road maintenance, rural health facilities, and community development, spent most of their funds on a recurrent basis. While no reliable figures on overall agricultural spending are available, estimates of the share of federal spending in total spending range from 40 percent to 60 percent.

One of the most prominent governmental programs in the agricultural sector concerned fertilizer subsidies, which accounted at times for half of total agricultural spending. Since the 1950s, regional governments increasingly arranged purchases of fertilizer and other key inputs for resale at an official, subsidized price, with a focus on supporting the production of export crops. In 1976, the federal government assumed responsibility, with state and local governments taking on parts of the costs of the subsidy as well as the expenses related to distribution. At the same time, the program was extended to cover food crops.

Available information indicates that subsidy rates were very high, at 75–85 percent of total fertilizer costs during the late 1970s to the mid-1980s, and then fell to less than 60 percent in the mid-1990s (Etuk 1986; World Bank 1996). Other production inputs, such as improved seeds (50 percent subsidy rate), agrochemicals (50 percent), and tractor services (25 to 50 percent) also received governmental support (Manyong et al. 2003). However, inefficiencies and lack of timeliness in the distribution system frequently undermined the programs and further raised their costs.

Another means of financial support to agriculture has consisted of concessional credit and credit guarantees. The National Agricultural Cooperative and Rural Development Bank was established in 1972 at the federal level to channel financial funds at concessional rates to individual farmers and farmers' cooperatives. In 1977, the Agricultural Credit Guarantee Scheme Fund was set up to

counter the shortage of credit available, particularly to small-scale agricultural producers. The fund was jointly established by the federal government (60 percent of the paid-up capital) and the central bank (40 percent) and provides guarantee cover for loans to agricultural producers through participating commercial banks. The cover pledges to pay the banks 75 percent of any outstanding default balance under the condition that existing collateral has been realized (Olaitan 2006).

The fund's loan portfolio built up quickly, reaching 0.2 percent of GDP in 1985 and 1986. After the structural readjustments were implemented, the fund rapidly became less important. Support for livestock operations, which were important during the boom phase of the fund, shifted toward food crops, which since the late 1980s have accounted for the majority of the guaranteed loans. From 1978 to 2004, the fund guaranteed a total of almost 400,000 loans, of which about 250,000 (64 percent) were subsequently fully repaid (Olaitan 2006). The costs of covering the guarantees for nonperforming loans were financed out of the retained earnings on treasury bonds that the fund had been accumulating over time.

Recent Developments and Prospects for Domestic Policy Reform

The democratically elected government that came to power in 1999 has realized the shortcomings of past policies and has embarked on reforms of the country's policies that are imposing distortions to agricultural and other sectors' incentives. In 2002, the government approved an ambitious and comprehensive agenda for policy and institutional reform on trade policy. Moreover, the National Economic Empowerment and Development Strategy of 2004 confirms the government's intention to lower or remove barriers to trade. Since then, the national government has launched major initiatives to modernize customs and port management, and it adopted the ECOWAS common external tariff (CET) in October 2005.

The adoption of the CET implies a major change in Nigerian trade policy. The ECOWAS CET consists of four bands (zero, 5, 10, and 20 percent), similar to those already being applied by members of the West African Economic and Monetary Union, a subset of ECOWAS member countries. During the transition period, which closed at the end of 2007, Nigeria applied 50 percent duty rates to imports in 102 tariff lines, or 1.9 percent of all lines. The resulting tariff profile was significantly less dispersed and carried lower average duty rates than Nigeria's pre-CET schedule. Indeed, the adoption of the CET is bringing simple average import duties, which had reached almost 30 percent, down to 12.1 percent (11.6 percent once the CET is fully implemented in 2008). The liberalization is particularly marked for agricultural products, which formerly received high protection.

What are the likely impacts of the ongoing trade reforms, and how are poor people, in particular, being affected? Predicting the effects of trade regime changes on income distribution is a complex and challenging undertaking. The extent to which changes in trade policy alter the prices of goods and services that are produced and consumed by poor households will naturally have a major impact on poverty levels. Moreover, price transmission, labor market flexibility, and the incidence of replacement taxes will have to be taken into account, although tax replacement is likely to be of less significance than it is in many other developing countries, given Nigeria's relatively minor dependence on trade taxes.

Nigeria's Federal Office of Statistics carried out a household survey in 2004 and found that the prevalence of poverty in the country had fallen over time, but that more than half of all Nigerians continued to live on less than \$1 a day (FOS 2005). As in many other countries, the share of households living in poverty is higher in rural (61 percent) than in urban areas (40 percent).

Some insights into how poor households will likely be affected by ongoing trade reforms can be obtained by assessing the impact of liberalization on the production and consumption patterns of the poor. The very poorest households tend to consume a relatively large amount of food, but they produce it themselves rather than rely on the market. Poor people in general spend a larger share of their monetized income on food than richer households. In Nigeria, the richest quintile of households devotes less than 43 percent to food purchases, while poorer households spend up to 60 percent on food (table 16.3). Hence, any change in food prices has a more pronounced impact on poorer than on richer households. The tariff changes stemming from the adoption of the ECOWAS CET imply that

Table 16.3. Structure of Annual Household Expenditure by Income Quintile, Nigeria, 2004

(in Nigerian nairas unless indicated otherwise)

Income quintile	Total per capita expenditure	Per capita nonfood expenditure	Per capita food expenditure	Share of food in total expenditure (percent)
1	7,226	3,520	3,706	51
2	13,263	5,467	7,796	59
3	19,234	7,572	11,663	61
4	28,261	11,880	16,381	58
5	68,952	39,543	29,408	43
Average	35,600	18,506	17,094	48

Source: FOS (Federal Office of Statistics) 2005.

Note: 133 nairas = US\$1.

average import duties on agricultural products would fall from 41 percent to 13 percent, while duties on manufacturing goods would drop from 28 percent to 12 percent. Even if price transmission for agricultural products is somewhat lower than for nonagricultural goods, agricultural and food prices should decrease by more than nonfood prices, thereby increasing the purchasing power of the poor by relatively more than that of richer households.

On the production side, the household survey reported substantial differences in the types of crops that different households grow. For example, more than half of all eggplant and tobacco is grown by households in the poorest quintile. Conversely, more than half of all coconut, papaya, and pineapple is planted by the richest quintile of households. Neither eggplant nor tobacco are subject to import prohibitions, while coconut, papaya, and pineapple all are. Moreover, the tariff protection for tobacco under the old national tariff schedule (import duty of 15 percent) and the CET (5 percent) is substantially below the average for agricultural products, while coconut, papaya, and pineapple each benefit from very high protection under the old regime (import duty of 100 percent) and the new import regime (20 percent). These observations suggest that rich households have in the past been able to influence the political process so that the structure of domestic market protection favors their interests rather than those of the poor. In this context, the full adoption of the CET and the phasing out of import prohibitions will reduce the antipoor bias in the trade regime and put poor household producers on a more equal footing with their richer counterparts in terms of the policy-generated transfers they receive.

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SENEGAL

*William A. Masters**

This chapter provides an overview and measurement of distortions to agricultural incentives in Senegal from 1961 through 2004. Senegalese agriculture is unusually specialized in just three products: groundnuts, rice, and millet. Groundnuts have remained Senegal's premier export, rice remains the principal import-competing food, and millet is the principal food crop. The data also include cotton, primarily because of its role elsewhere in the region. Several other products are of significance to particular communities within Senegal but are much less important at the national level. These include exportables such as fish, import-competing products such as meat or maize, and a range of items with little international trade such as sorghum and cowpeas. Fertilizers also play an important role, with Senegal exporting phosphates and importing nitrogenous compounds.

Most descriptions of Senegal begin by noting that it was the favored capital of French West Africa, with Dakar as the French center for colonial administration and industry. This status led to an unusual economic structure, with a very large government and service sector relative to the country's size. Adjustment after independence in 1960 was slow and painful. Real gross domestic product (GDP) measured in purchasing power parity fell by more than 20 percent during the 1960s and 1970s. This long decline ended in 1980, when Senegal became the world's first country to enter a World Bank-sponsored structural adjustment program. Incomes rose in the 1980s, fell again from 1988 to 1994, and have risen steadily since then. Policy changes were spread out over more than a decade, but

* The author is grateful for the assistance of Harounan Kazianga, Marianne Kurzweil, and the project team in Washington, as well as for helpful comments from the World Bank country office in Dakar. Detailed data and estimates of distortions reported in this chapter can be found in Masters (2007).

since 1993 the country has enjoyed sustained growth, fueled by an exchange rate devaluation in 1994 and subsequent aid flows.

A remarkable feature of Senegal's long decline and eventual turnaround is its relative steadiness. There was no growth collapse, and internal conflict was limited to a long but relatively small insurgency in the Casamance region, which did not break out until after the economic decline had ended. For most Senegalese, relative peace and stability prevailed throughout the period of economic decline, despite wrenching changes in every aspect of Senegalese life that could easily have involved widespread violence and macroeconomic instability. Instead, the restructuring of Senegal's inefficient and inequitable colonial economic institutions was spread out over more than 40 years. Many challenges remain and growth reversals may again occur, but the country now has a much more open and competitive economic structure and a more favorable outlook for the future.

This chapter focuses on Senegal's policy choices. Other countries' policies are taken as given, considered to be part of Senegal's market environment. France has been particularly important, of course, through both fiscal transfers and market prices. French decisions set the starting point for Senegalese policy in 1960 and heavily influenced the opportunity costs for any subsequent reforms. Those opportunity costs are measured using Senegal's actual border prices, even though these include European trade preferences and other countries' export subsidies, to capture the net effect of all influences on Senegal's market opportunities.

The net effects within Senegal are also examined, with each commodity category treated as a single market. In fact, Senegalese policy involved significant discrimination within markets, using quota allocations, fiscal transfers, and cross-subsidies to favor particular groups, especially marabout religious leaders whose political support was of great value to the government. These cross-subsidies do not appear when measuring the aggregate average distortion from world prices. They may have been necessary for political stability, but they were probably costly for economic growth, making the reforms of the 1980s and 1990s even more valuable for future growth than the estimates in the data would imply.

Economic and Structural Change since 1955

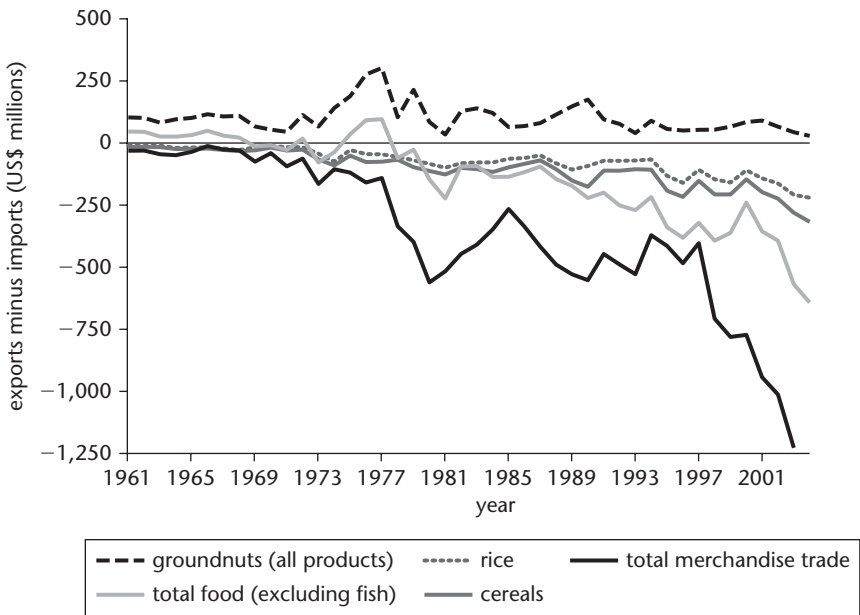
Senegal's economic structure was built by French colonials in the 19th and early 20th centuries. The country served as the administrative and logistical hub for French West Africa, exporting groundnuts and groundnut oil from the region to metropolitan France while importing low-quality rice from French colonies in Southeast Asia. Revenues from this system were generally repatriated to France rather than reinvested within Senegal, so even before independence, the country was in serious economic difficulty. Data are limited, but as Diawa-Mory Traore

(1969, pp. 37–38) noted, “the post-1955–56 period . . . was characterized by a general decline of output in (most) major industrial groups.”

At independence, agriculture continued to employ the vast majority of workers, so living standards for the poor were determined mainly by the country’s farm productivity. From 1960 through the mid-1980s, Senegal’s total food output fluctuated but did not grow at all, whereas population more than doubled. As a result, food output per capita declined by more than 50 percent. Since the reforms of the 1980s, total agricultural output has doubled, but population has doubled again, so per capita production has been about constant. In Sub-Saharan Africa as a whole, total output has grown much faster, producing much less decline in output per capita than has occurred in Senegal.

The consequences of stagnant farm productivity for Senegal’s trade are noteworthy. Exports of groundnut products grew briefly in the 1970s and again in the late 1980s, but in each case they then fell back to their 1961 level. An expansion of the local groundnut-oil industry virtually eliminated the export of raw groundnuts in the late 1960s, but the sector as a whole did not grow (figure 17.1). Stagnation of this sector is often attributed to limited demand on world markets, but the

Figure 17.1. Net Merchandise Trade, Senegal, 1961–2004



Source: Compiled by the author, using FAO 2006 data.

Note: Value for total net merchandise trade in 2004 was $-\$1.6$ billion (not shown).

lack of aggregate growth despite local value added suggests that supply constraints were also important. At prevailing prices and productivity levels, farmers have been unable to devote more land or labor to any export, and the country as a whole has survived (albeit with high malnutrition rates) thanks only to steadily increasing food imports.

Net imports of all kinds can be a desirable counterpart to aid and capital inflows. In aggregate, imports grew very rapidly in the 1970s and again from 1997, but food trade followed a trend of its own, with imports of food steadily increasing since the late 1970s. Only a small fraction of this trend is attributable to increasing imports of rice. Increasing imports of other cereal grains add to the trend, and since 1989 imports of other foods have seen even larger increases. In sum, stagnation of local agricultural production has led Senegal to devote a large fraction of available foreign exchange to food imports (see figure 17.1), with continued poverty allowing very limited improvement in dietary quality.

Table 17.1 presents the food balance sheet, compiled by the Food and Agriculture Organization (FAO), for Senegal, for 1961 and 2003. The first pair of columns shows self-sufficiency ratios, and the second pair shows dietary composition. Cereals continue to dominate the diet, providing over 60 percent of calories, of which the share supplied by local production declined from 0.73 to 0.43 between 1961 and 2003. Starchy roots account for a small and falling fraction of the food supply. The most unusual aspect of the Senegalese diet is its extraordinarily high consumption of vegetable oils, with lower-cost soybean oil replacing much of the groundnut oil that had been the focus of colonial development policy.

Most African countries have significantly increased their cropped area since the early 1960s, under pressure of rural population growth, but in Senegal there has been almost no increase. One reason Senegalese farmers have not undertaken similar expansion into previously unattractive areas is that they lack profitable technologies with which to do so. That lack of profitable expansion opportunities results in part from the country's unusual focus on groundnuts and millet. Some combination of a legume such as groundnuts with a cereal crop such as millet is typical of rainfed systems around the world, but Senegal's focus on these particular crops reflects the country's political history as much as its agronomic conditions. Groundnuts were deliberately imposed on farmers by the French in the late 1800s and early 1900s, while millet became the dominant food grain by default because of a lack of investment in farmers' alternatives.

Raising incomes without a change of crop species is difficult. Some farmers are turning from groundnuts to cowpeas and have recently also been planting maize instead of millet. These other crops are widely grown in countries whose agronomic conditions are similar to Senegal's, but Senegalese farmers have had only limited access to appropriate new varieties that would stimulate substitution. The

Table 17.1. Food Balance Sheet Data, Senegal, 1961 and 2003

	Self-sufficiency ratio ^a (Production/ utilization)		Dietary composition (Percent of total calories)	
	1961	2003	1961 ^b	2003 ^c
Cereals, excluding beer	0.73	0.43	60.6	60.4
Wheat	—	—	5.2	9.2
Rice (milled equivalent)	0.34	0.15	20.4	32.0
Maize	0.59	0.66	4.6	4.5
Millet	1.00	1.00	23.1	9.6
Sorghum	0.95	1.00	6.8	5.1
Starchy roots	0.94	0.83	5.7	2.3
Cassava	1.00	0.99	5.0	1.9
Sugar and sweeteners	0.00	0.61	8.5	6.0
Pulses	0.98	0.96	1.4	1.2
Groundnuts (shelled equivalent)	1.62	1.00	3.4	2.1
Vegetable oils	4.15	0.50	8.3	15.1
Groundnut oil	5.03	1.56	6.9	5.0
Soybean oil	—	—	—	7.7
Palm oil	0.55	0.17	1.2	1.3
Vegetables	0.55	0.88	0.7	1.6
Tomatoes	0.12	0.55	0.3	0.1
Onions	0.43	0.62	0.2	0.6
Vegetables, other	0.97	0.98	0.2	1.0
Fruits	0.70	0.83	0.6	0.7
Bananas	0.91	0.36	0.0	0.1
Meat	0.99	0.92	2.8	3.2
Bovine	0.98	0.97	1.8	1.0
Poultry	0.97	0.84	0.1	1.1
Milk (excluding butter)	0.78	0.48	2.4	2.2
Eggs	0.88	0.99	0.1	0.4
Fish, seafood	—	—	1.5	2.3

Source: Compiled by the author from FAO (2006) food balance sheet data.

Note: — = no data are available.

a. The self-sufficiency ratio is computed as production plus stock change, divided by total utilization (labeled as "domestic supply" by the FAO).

b. Total calories for 1961 = 2,290.

c. Total calories for 2003 = 2,374.

only crop with significant yield growth has been rice, which is grown under irrigation. Rice output has benefited from a relatively high level of public research (Fisher, Masters, and Sidibe 2000), but total irrigable area is small and limited. The major rainfed crops have a larger area under cultivation and probably more opportunity for expansion if only farmers had access to more productive technologies.

Fertilizer use is a key contributor to sustainable crop productivity growth. Senegal is a significant exporter of phosphates, but it imports nitrogenous fertilizers. The value of phosphate exports rose suddenly in the mid-1970s but declined steadily thereafter. Consumption of fertilizers grew throughout the 1970s but was not associated with significant crop yield increases and quickly fell back to earlier levels. Since 1990, however, fertilizer consumption has steadily increased, helping to lay a foundation for sustainable crop yield growth in the more competitive farming systems.

Government Policy in the Colonial Era

French colonial policies gave Senegal a distinctive social history. One key legacy is Africa's oldest tradition of electoral democracy. In 1848, France gave all Senegalese the right to vote in its national elections. This was the first universal suffrage vote in Sub-Saharan Africa, and it resulted in the first African representative to a European parliament. Those elections may have had little practical influence on the colonial policies of the day, but they could have helped establish the culture of representative government that Senegal has enjoyed since independence. Despite the political stress imposed by low and falling per capita incomes, independent Senegal is one of the very few African countries to have experienced repeated contested elections and only peaceful transfers of power, from Léopold Sédar Senghor to his chosen successor Abdou Diouf in 1981, and then to longtime opposition party leader Abdoulaye Wade in 2000; Wade was reelected in 2007.

A second key legacy of French colonialism is Senegal's unusually high level of urbanization. From 1902, Dakar was developed as the capital for all of French West Africa, with a far larger urban population than the Senegalese economy could efficiently support. At independence, 32 percent of the population was urbanized, more than twice the average for Sub-Saharan Africa. By comparison, Ghana's urbanization rate at the time was also above average but still only 23 percent (World Bank 2006). The city's administrative role left independent Senegal with an extraordinarily large civil service. The national government absorbed almost all of the functionaries who had previously governed French West Africa and then the Mali Federation, doubling the state operating budget during the transition period from 1957 to 1961 (Schumacher 1975).

If the city of Dakar had been developed for commercial or industrial reasons, one might expect Dakar's size to be a source of economic dynamism, but France's *pacte colonial* severely constrained local growth opportunities. Boone (1992) describes in detail how French trading houses were established and protected by colonial authorities. Their *traite* was a closed circuit of trade between France and its colonies, exporting groundnuts in exchange for high-priced French manufactures and consumer goods, including the lowest-quality broken rice from Southeast Asian colonies. After World War II, some import-substituting industries were established in Dakar, competing with French products but heavily protected against imports from elsewhere, with market shares dictated by negotiation among the trading houses and with the colonial government. The development of these subsidized industries imposed a double burden on the Senegalese economy, first by reducing the savings available for any more efficient investment at that time and later by requiring massive adjustment costs when subsidies were removed.

Within agriculture, the country has a long history with groundnuts and millet. There was a long rise in groundnut production from the late 19th century until independence, when it began to fall and was replaced by millet for domestic consumption. Now millet itself is being replaced by other foods.

Important questions in Senegalese economic history are why the colonial government chose to focus on groundnuts and why that focus proved to be so durable. Bonnefond and Couty (1991) suggest a number of contributing factors. One was the availability then of emancipated slaves, who had been freed in 1848 and could be put to the task under the leadership of local marabout religious leaders in what became the groundnut basin. A second was the completion of a railroad from that region to the sea. With abundant labor, an outlet to trade, and few other alternatives at hand, African farmers' groundnut production grew steadily throughout the colonial era, from an annual average of 31 thousand metric tons in 1886–90 to its eventual peak after independence. Growth was fastest in the early years, with production expanding by an annual average of 7.5 percent from 1885 until 1930. Growth slowed after 1930, partly because of a slowdown in area expansion but also because there was no further productivity growth: average yields were 870 metric tons a hectare in the 1930s, and they have fluctuated around that level ever since.

France's 19th-century investment in transportation and marketing infrastructure, which facilitated agricultural exports, unlocked the potential of inland areas to supply the coasts. Groundnut was an attractive product to export, but without colonial restrictions farmers would probably have been much more diversified, particularly if the alternative included government policies to support other crops. French colonial policy focused on groundnut, however, and so it remained the only possible source of cash income for farmers who relied on rainfed crops.

Agricultural Policy since Independence

After independence in 1960, Senegal's political leadership used the colonial-era bureaucracy for a sequence of "socialist" and "nationalist" initiatives, to replace French entities with Senegalese ones. Schumacher (1975) and Boone (1992) describe this process in detail, focusing on agriculture and industry, respectively.

For agriculture, the single most important institutional change was the introduction, in January 1960, of the *Office de Commercialisation Agricole* (OCA), a state-owned enterprise created to replace the small group of French trading firms that had dominated the circuit of groundnut exports and imports of rice and farm inputs. In particular, the OCA was given a legal monopoly over groundnut marketing, to be exercised by licensing either private buyers or, preferably, one of the state-promoted rural cooperatives. It was also charged with arranging for increased imports of farm inputs, using its legal monopoly over the groundnut trade to recoup operating loans to farmers for the purchase of those inputs. The OCA was also given a monopoly over rice imports, which it allocated to local traders with some limited controls over resale prices. Loans were administered by another new entity, the *Banque Sénégalaise de Développement* (BSD), in collaboration with the rural development services, which were reorganized into a set of *Centres Régionaux de l'Assistance pour le Développement* (CRADs) and local cooperatives.

The OCA-BSD-CRAD-cooperative system was able to maintain the groundnut circuit in the first few years of independence, avoiding the most likely alternative, which would have been a sudden collapse of trade volumes and a period of extreme hardship. Replacing French traders with state-owned enterprises kept trade flowing, but the whole enterprise was almost certainly unsustainable. Margins were shrinking, and within the marketing chain, agents at each stage found opportunities for diversion: individual farmers against their cooperatives, cooperative managers against their lenders, loan officers against the OCA. As detailed by Schumacher (1975), similar problems had plagued colonial administrators. Instead of liberalizing, however, the new government responded by attempting to eliminate private markets entirely and to use administrative means to control corruption within the bureaucracy.

In 1966–67, the OCA was replaced by the *Office Nationale de Cooperation et d'Assistance au Développement*. This agency, which was charged with input distribution and transport as well as groundnut marketing, lasted for about a decade before being dissolved in 1980. The pace of change was dictated in part by France's willingness to support the Senegalese structures it had helped create. But decolonization coincided with European integration, so France's trade preferences had to be extended to Europe as a whole. These trade preferences, and some fiscal transfers, were governed by a series of agreements among European countries with their former colonies: first the Yaoundé Convention of 1963, soon followed

by the Lomé Convention and more recently the Cotonou Agreement, which took effect in 2002. It is not clear whether these agreements improved or worsened conditions for Senegal, or what the counterfactual might have been. In this study, this external environment is taken as given.

By the end of the 1970s, the Senegalese economy was among the most distorted in West Africa. In 1980, Senegal became the first of the region's countries to start a World Bank–sponsored structural adjustment program, but the reform process was slow. In the rice market, for example, a comparison of government interventions across 12 West African countries in 1979 gave Senegal a score of 0.5 on a 0-to-9 scale, where 9 is “generally competitive, with market determined prices” (Randolph 1994, table 2). The only other country to score below 2 was Mauritania, with a score of 0.7. By 1993, after more than a decade of reform, Senegal had raised its score to 3.9, but it still had the most highly controlled market of the region (Randolph 1994, table 5). Jammeh (1987) provides a detailed description of the reforms undertaken in the 1980s.

In retrospect, what is most notable is how many of the changes introduced between 1986 and 1988 under the New Industrial Policy were subsequently reversed. By 1993, just before the regionwide devaluation of the CFA franc, Senegalese tariff rates were very high (75 percent on consumer goods produced locally; 45 percent on other consumer goods). Government limited competition among domestic firms as well, with *conventions spéciales* protecting privately owned monopolies in sugar, cement, and petroleum, and continued its control of rice imports, groundnut processing, and the ports (IMF 1995).

Price Comparisons and the Measurement of Distortions

To measure distortions over time in a consistent way, this study uses the methodology described in appendix A of this volume and in Anderson et al. (2008). The focus is on government-imposed distortions that create a gap between domestic prices and what they would be under free market conditions. The method relies on historical observations of prices paid or received in foreign trade, combined with a set of assumptions about the marketing margins that would have applied. Because the characteristics of agricultural development cannot be understood from a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures (including distortions in the foreign exchange market) but also generates estimates of distortions in nonagricultural sectors for comparison. A nominal rate of assistance (NRA) is computed for various farm industries, along with an estimate of NRAs for nonagricultural tradables, which is compared with that of agricultural tradables through the calculation of a relative rate of assistance (RRA).

The analysis does not consider interventions in input prices. For Senegal, those are likely to have been very small relative to distortions to prices of outputs, and in any case there are insufficient observations to provide useful estimates. Thus, the results hinge on simple price comparisons in each product market, net of the assumptions about marketing margins and the estimate (again following the project's methodology outlined in Anderson et al. 2008) of exchange rate distortions in each year.

Groundnut prices and marketing margins

The approach to the groundnut market taken here focuses on the opportunity cost of the raw nuts (in their shells), before they are processed into groundnut oil. This method measures the NRA for the production of the groundnuts themselves. An attempt was made to obtain satisfactory data on processing costs and market prices for groundnut oil, to measure the nominal protection afforded to the operations of SONACOS, the parastatal groundnut processor. But the effort proved futile because of the lack of transparency in SONACOS, which since 2003 has been slowly privatized under intense political scrutiny. In January 2007, SONACOS was renamed Suneor and was majority-owned by Advens, a private consortium. Looking back over the history of SONACOS, it is clear from the pricing of raw nuts that its operations have been highly subsidized at the expense of farmers, taxpayers, and oil consumers. One estimate for marketing year 2001–02 suggests that, given all of SONACOS's procurement costs, its tradable inputs were subsidized at a rate of about 23 percent, which more than offset the 8.5 percent premiums it paid on nontradable factors such as labor and which was much larger than the 7.7 percent implicit subsidy that SONACOS received from protection on its sales. The net effect was a substantial transfer to SONACOS, amounting to 20 percent of the firm's market revenue (République du Sénégal 2003). In the absence of a time series for such operational data, however, the full extent of distortions in the processing sector cannot be determined.

The price comparison method used here starts with the unit values of Senegal's raw nut exports, obtained from FAO file data, and compares them with estimated farmgate selling prices reported by a sequence of published sources for various periods of time. The farmgate prices are from Boone (1992) for 1959 and 1966–79, Kelly and Delgado (1991) for 1980–89, and the IMF (2005) for 1997–2004, with linear interpolations for the periods between those observations. These published sources report prices from a variety of official publications and official file data. There appears to be no contemporary publication or file data with a complete time series for the entire 1960–2004 period.

Because the FAO unit values are measured at Dakar whereas the farmgate prices are paid in the groundnut basin, the observed price difference between them includes transport and marketing costs. The price distortion attributable to trade restrictions is the observed price difference minus the estimate of what those costs would be in the absence of government trade restrictions. The best estimate of this margin is borrowed from Kite (1993), who quotes a margin from the groundnut basin to Dakar for competitive traders of cereal grains equal to 17 percent of the farmgate price. That is likely to be an upper bound for the cost of groundnut marketing, because at least some of the margin would be a per ton charge for transport, and groundnuts have a higher value than grains. If the margin was lower, implied rates of taxation would be greater. To proceed conservatively, this study applies this same percentage margin to this crop for all years.

In addition, the FAO unit values refer to much-higher-grade nuts than the national average. An adjustment must be made for quality differences as well as for transport costs. No independent estimate for the historical market value of this quality differential could be found, and so a conservative calibration approach was used. This approach sought the percentage quality differential that, when applied over all years, resulted in the smallest level of taxation, given the observation that there was no period of sustained subsidies for groundnut production. This method is conservative in the sense that it might understate the absolute value of taxation, if the market value of the quality premium for exported nuts is actually smaller than the calibrated value. The calibration procedure yields a plausible price premium estimate of 35 percent for export-quality nuts, as opposed to the national average quality. One important aspect of this result is that it includes the policy rent paid by European importers deriving from trade preferences for Senegalese country of origin, in addition to European consumers' valuation of the product's intrinsic quality. From Senegal's point of view, however, this policy rent can be taken as given, serving as a marginal incentive just like any other type of willingness to pay.

Rice prices and marketing margins

The approach to rice is similar to that for groundnuts, in that FAO file data on the unit values of Senegal's rice imports are compared with published estimates of farmgate prices, net of the study's estimates for the marketing margins and quality premiums that would be paid for these transactions in the absence of trade restrictions. The import unit values from the FAO, which refer principally to broken rice from Southeast Asia, are compared with farmgate prices reported by Randolph (1997) for 1961–95 and IMF (2005) for 1997–2004. In this case there is

only one missing value, for 1996, which is interpolated linearly from the 1995 and 1997 observations. As with groundnuts, there appears to be no publication or data source with a continuous time series.

For transport costs between Dakar and rice farmers, the 17 percent estimate of Kite (1993) is used and applied uniformly to all years. Adjustments in product quality were required because imported rice is usually of a much lower quality than that produced domestically in Senegal. In the absence of an independent estimate for the historical market value of this quality differential, a calibration approach was taken similar to that used for groundnuts. The goal in this case was to find the uniform percentage quality differential that, when applied over the entire period, is consistent with the policy observation of approximately zero net taxation or subsidies over the decade of the 1960s. This calibration procedure yields an estimated discount for imported rice of 30 percent, which was consistent with anecdotal evidence.

An important caveat is that this quality discount is calibrated to fit historical prices, and it is possible that quality values have not only fluctuated but also trended over the years. (No such trend error would have occurred in the groundnuts case, because that calibration was based on observations about policy over the entire period.) But it turns out that the 30 percent quality differential calibrated for the 1960s is also consistent with the absence of nontariff barriers to rice traders after liberalization in 1995, which gives some confidence in the stability of this parameter over time.

Millet prices and marketing margins

Millet is included in this study to represent the large fraction of Senegalese agriculture that is produced and consumed primarily within rural areas. This basic food is actively traded across short distances, but its low value-to-weight ratio limits the extent of long-distance transport and international trade. This grain is a necessity for the rural poor, but effective market demand is limited because higher-income consumers prefer foods that require less preparation time or have other attractive characteristics. There is no price distortion from government intervention. At the same time, there is also little public investment in new technology or other drivers of productivity growth. This product is treated as non-tradable internationally.

Millet is normally much less valuable than rice, but it appears to have become more costly than rice since the mid-1990s. This switch in national average farmgate prices probably stems mainly from differences in the location of production—rice is increasingly abundant in irrigated and urban areas, whereas millet remains in the dryland regions, where it is grown for local consumption.

Quantities produced

Quantities produced are used for the computation of aggregate NRAs. Weights are based on FAO estimates of total production valued at undistorted prices. Rice production grew rapidly from 1973 to 1990, when real farmgate prices fluctuated with no trend, and then production stayed constant after 1990 even as real farmgate prices fell sharply. This pattern suggests significant shifts in the rice supply curve, attributable perhaps to public investment in genetic improvement and infrastructure, especially for irrigation. In contrast, estimated production of both groundnuts and millet has trended down in recent years, despite roughly constant real prices.

Exchange rates and macroeconomic distortions

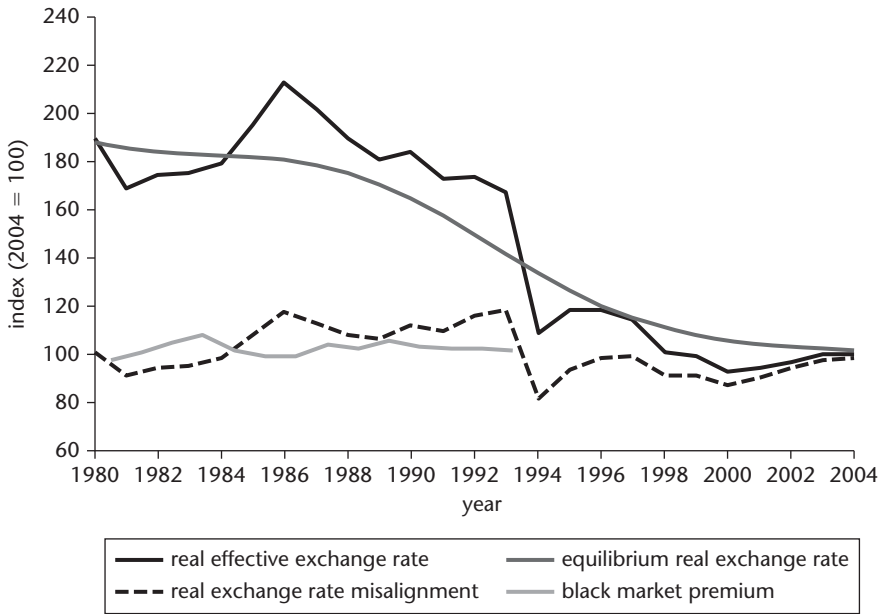
Distortions to the market for foreign exchange have been small in Senegal relative to other African countries. Like most other former French colonies in Africa, Senegal has never had its own monetary policy. After independence, the colonial currency, the *franc des Colonies Françaises d'Afrique* (CFA franc) was simply renamed the *franc de la Communauté Financière de l'Afrique* using the same acronym and the same fixed rate of CFAF 50 per French franc. Convertibility was guaranteed by capital inflows from France, underwriting the balance of payments deficit of the CFA region with the rest of the world. Senegal accounted for a very small fraction of these inflows, but the total payment needed to support the currency became increasingly unsustainable and on January 12, 1994, the region's currency was devalued to CFAF 100 per French franc. It has remained convertible at that valuation ever since, switching its peg to the Euro in January 1999.

The real exchange rate consequences for Senegal of the CFA franc's fixed nominal rate are illustrated in figure 17.2a. The real effective exchange rate (REER) shown there is the International Monetary Fund's measure of differential inflation between Senegal and its trading partners, after conversion between currencies at official exchange rates. What is most noticeable is the relative stability of Senegal's real exchange rate. The country did have faster inflation than its trading partners during the 1981–86 period, resulting in an appreciation of its REER totaling about 24 percent over five years, but then it had slower inflation and a depreciation until 1994 that returned the REER back to its 1981 level. There was only one year of appreciation after the devaluation of 1994, followed by another five years of low inflation and REER depreciation, before a slight upturn in the REER in 2001–03.

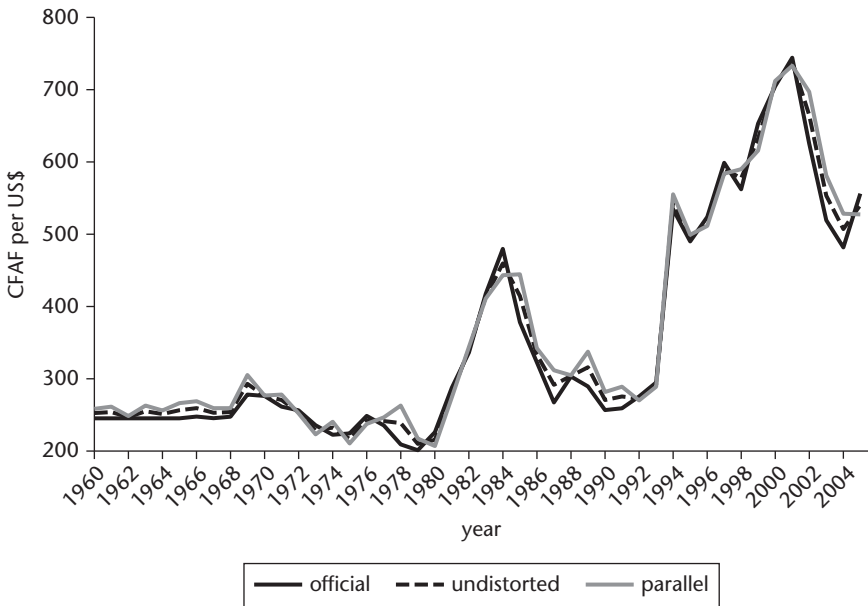
Clearly, Senegal has not experienced the same inflation-induced overvaluation as many other countries, including many of its neighbors in the CFA zone. Indeed, relative to other countries, Senegal's macroeconomic policies caused the country's

Figure 17.2. Foreign Exchange Rates, Senegal, 1960–2005

a. Real exchange rates, 1980–2004



b. Nominal exchange rates, 1960–2005



Source: Official exchange rates, IMF 2006; black market or parallel rates, Easterly 2006; real exchange rate indexes, Elbadawi 2006. Author's estimate of the undistorted rate is based on the methodology of Anderson et al. 2008.

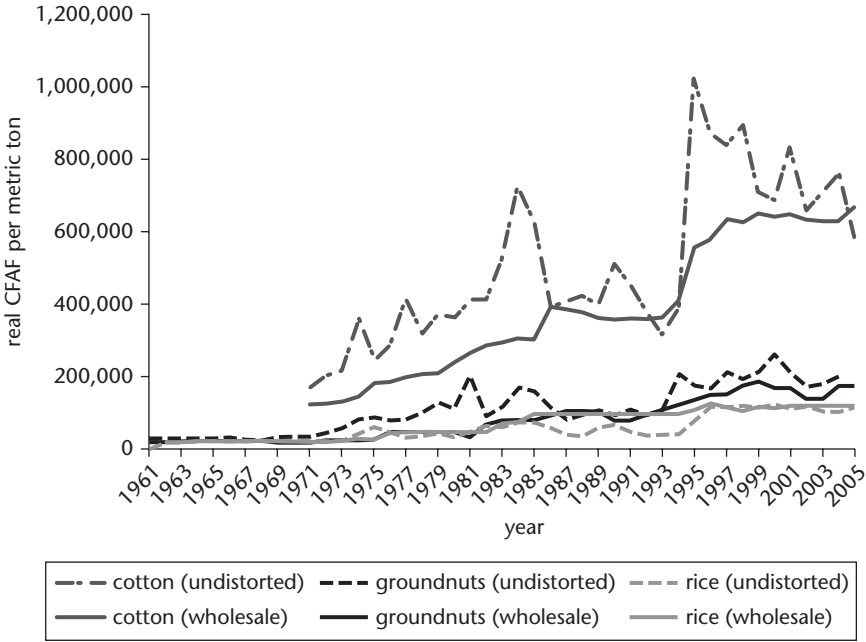
price level at official exchange rates to gain only about 30 percent in value in the decade before the 50 percent devaluation imposed by France. This limited degree of overvaluation is shown in figure 17.2a by the difference between the IMF's REER and the estimated equilibrium real exchange rate (EqRER), which is the econometric result of an exercise conducted by Elbadawi (2006), using a worldwide panel of REERs and their determinants to estimate what each country's REER would be without the influence of short-term fluctuations in unsustainable fiscal and monetary policies. The difference between the REER and the EqRER is an estimate of RER misalignment (RERmis), with an increase in RERmis reflecting an increasingly overvalued currency. The 1994 devaluation much more than compensated for any of Senegal's own macroeconomic imbalances, although the overshooting was quickly eroded, and by 2004, the RERmis index was back to where it started in 1980.

For a consistent measure of policy-induced distortions in agriculture, instead of RER misalignment, this study uses the information implied by the Easterly (2006) data on black market premiums paid for the CFA franc in parallel markets. These data, reported in figure 17.2b, show that despite the French effort to support the CFA franc, a small degree of excess demand for foreign currency prevailed from 1960 through 1970, and again in most years from 1978 through 1993, and also in 2002–04. The project's approach (Anderson et al. 2008) is to compute an undistorted marginal value of foreign exchange earned or saved as a blended average between the black market premium and the official exchange rate. This is shown in figure 17.2b as the dashed line, roughly halfway between the other two. Because the black market premium is small in Senegal, this kind of distortion is of little consequence for the estimates.

NRA estimates

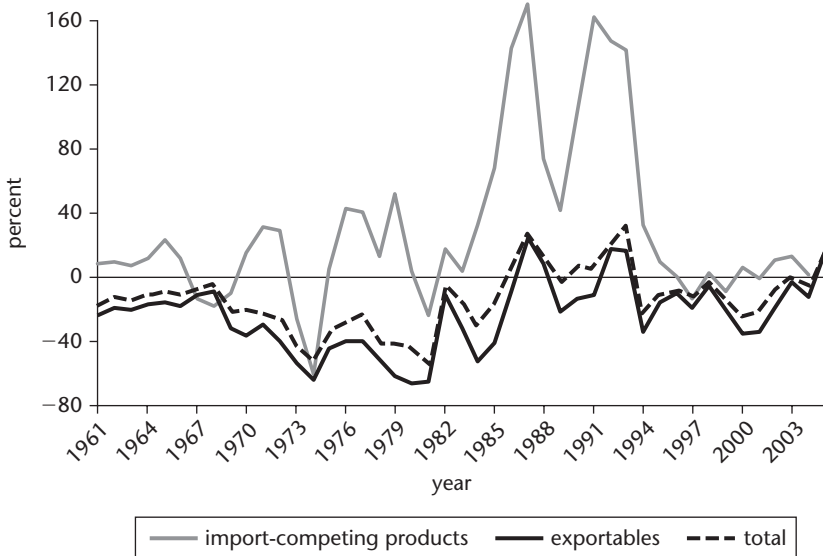
The net effect of government policies on agricultural incentives is summarized by the prices shown in figure 17.3 and the NRAs shown in figure 17.4 and table 17.2. During the early 1960s, groundnut production was moderately taxed (and groundnut processors thereby helped), whereas rice production was slightly subsidized (and rice consumers thereby harmed). This pattern of protection, restricting both exports and imports, imposed a moderate level of antitrade bias, which widened considerably over the 1970s. For groundnuts and cotton, export prices rose much faster than the farmgate price in the 1970s, then fell in the 1980s before rising again after 1995. Domestic prices followed the trend but with much greater stability. A similar story applies to rice. In both cases, domestic prices were institutionally fixed, and year-to-year changes in distortions were driven by changes in foreign prices. During the brief period of high import prices in

Figure 17.3. Wholesale and Undistorted Prices, Selected Crops, Senegal, 1961–2004



Source: Data compiled by the author. Data shown are in real CFA francs at 2004 prices, deflated by the consumer price index in the International Monetary Fund's *International Financial Statistics*, 2005.

Figure 17.4. NRAs for Exportable, Import-Competing, and All Farm Products, Senegal, 1961–2005



Source: Data compiled by the author.

Note: The total NRA can be above or below the exportable and import-competing averages because assistance to nontradables and non-product-specific assistance are also included.

Table 17.2. NRAs for Covered Farm Products, Senegal, 1961–2004
(percent)

Product indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
Exportables ^{a,b}	-19.9	-17.3	-44.6	-47.8	-45.4	-7.7	-5.2	-14.2	-20.8
Groundnuts	-19.9	-17.3	-44.4	-47.7	-44.7	-7.4	-5.0	-13.7	-21.1
Cotton	—	—	-47.9	-50.6	-55.7	-15.0	-11.1	-26.5	-10.0
Import-competing products ^{a,b}	9.5	-1.4	-2.3	30.5	6.6	99.4	117.1	-2.1	5.9
Rice	9.5	-1.4	-2.3	30.5	6.6	99.4	117.1	-2.1	5.9
Nontradable ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millet	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total of covered products ^a	-14.6	-11.7	-33.2	-33.7	-30.3	5.2	6.7	-9.9	-12.1
Dispersion of covered products ^c	20.3	16.1	33.5	44.5	38.2	58.8	67.1	14.3	18.6
Percent coverage (at undistorted prices)	70	70	70	70	70	70	70	70	70

Source: Data compiled by the author.

Note: — = no data are available.

- a. Weighted averages, with weights based on the unassisted value of production.
- b. Mixed-trade-status products included in exportable or import-competing groups depending upon their trade status in the particular year.
- c. Dispersion is a simple five-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

1974–75, rice producers were slightly taxed to the benefit of consumers in contrast to the 20 years thereafter when lower international prices resulted in a very high level of protection for rice producers. Both of these were largely eliminated after 1995, although it is likely that moderate taxation of groundnut and cotton producers remained. There was very little short-term correlation between domestic and foreign prices until the experience with groundnuts after 2000 (see figure 17.3).

When combined with the zero distortion to the price of nontradable millet (whose share of the value of farm production has been in the range of 15–30 percent), the overall NRA for the four covered products fluctuated from less than 15 percent taxation in the 1960s to more than 30 percent taxation in the 1970s and early 1980s, before turning to slightly positive support in the latter 1980s, when international national prices were extremely low, and then settling at about 10 percent taxation since the mid-1990s.

For other farm products (roughly one-third of overall farm production), in the absence of commodity-specific data, the study guesstimates that 30 percent is import-competing, with an average NRA of 20 percent from import restrictions; another 30 percent is exportable, with an average NRA of -10 percent from export restrictions; and 40 percent is nontradable, with no distortions. That yields an average NRA for noncovered farm products of about 3 percent when the distortions to exchange rates also are taken into account and hence a slightly less negative NRA average for the entire sector than for just covered products (upper half of table 17.3).

The lower half of table 17.3 compares the NRAs for the tradable part of the agricultural sector with the guesstimate of the NRA facing producers of tradable nonagricultural goods. For the latter, it is assumed that two-thirds of the value of production of those goods is import-competing, with an average NRA of 20 percent from import restrictions, and that one-third is exportable, with an average NRA of -10 percent from export restrictions. That yields an average NRA for nonagricultural tradables of about 7 percent when the distortions to exchange rates also are taken into account, and hence a more negative RRA than NRA for agricultural tradables (lower half of table 17.3). That is, this guesstimate for assistance to nonfarm producers worsens the estimate of the antiagricultural bias in Senegal. As can be seen from the annual data in figure 17.5, that bias was present for all but three years in the period from independence to 2004.

Finally, the bottom three rows of table 17.3 show what some key indicators would have been if exchange rate distortions had not been included. The NRAs and RRA change little, suggesting that exchange rate policy was not a significant part of the distortions to agricultural incentives in Senegal.

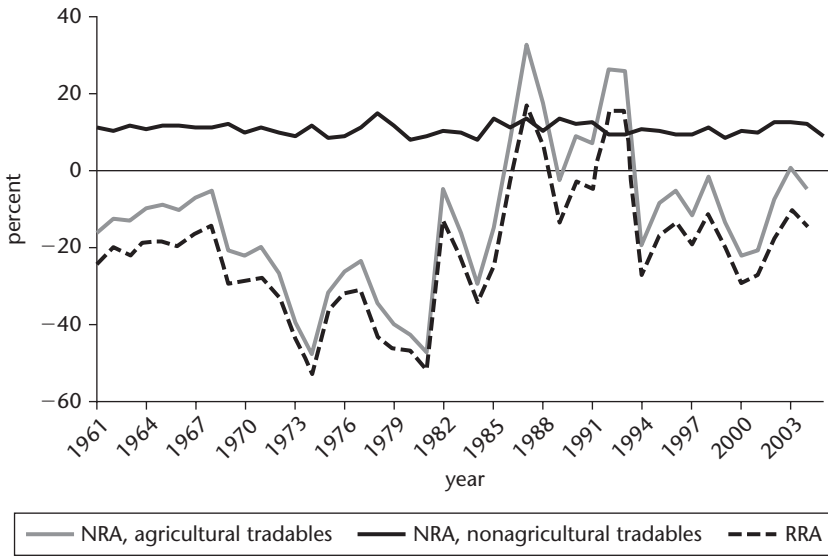
Table 17.3. NRAs for Agriculture Relative to Nonagricultural Industries, Senegal, 1961–2004
(percent)

Indicator	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04
NRA, covered products	-14.6	-11.7	-33.2	-33.7	-30.3	5.2	6.7	-9.9	-12.1
NRA, noncovered products	3.2	3.3	3.1	3.2	2.8	3.4	3.2	3.0	3.2
NRA, all agricultural products	-9.3	-7.2	-22.4	-22.7	-20.5	4.7	5.6	-6.1	-7.5
Trade bias index ^a	-0.32	-0.27	-0.47	-0.53	-0.47	-0.42	-0.42	-0.20	-0.30
NRA, all agricultural tradables	-12.7	-10.5	-30.9	-31.1	-28.0	8.2	9.7	-8.1	-10.9
NRA, all nonagricultural tradables	11.1	11.6	10.3	11.1	9.1	12.4	10.9	9.8	11.4
RRA ^b	-21.4	-19.8	-37.4	-37.9	-34.1	-3.6	-1.0	-16.3	-20.1
Memo item, ignoring exchange rate distortions:									
NRA, all agricultural products	-8.2	-5.8	-22.2	-22.0	-21.0	6.6	6.2	-6.2	-6.6
Trade bias index ^a	-0.29	-0.22	-0.47	-0.51	-0.49	-0.36	-0.40	-0.21	-0.25
RRA ^b	-19.3	-16.8	-36.9	-36.5	-35.0	1.2	0.7	-16.6	-17.7

Source: Data compiled by the author.

- a. Trade bias index is $TBI = (1 + NRA_{ag,x}/100)/(1 + NRA_{ag,m}/100) - 1$, where $NRA_{ag,m}$ and $NRA_{ag,x}$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.
- b. The RRA is defined as $100 * [(100 + NRA_{ag}^t)/(100 + NRA_{nonag}^t) - 1]$, where NRA_{ag}^t and NRA_{nonag}^t are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

Figure 17.5. NRAs for Agricultural and Nonagricultural Tradables and the RRA, Senegal, 1961–2005



Source: Data compiled by the author.

Note: For a definition of the RRA, see table 17.3, note b.

Conclusions

Senegal’s groundnut and rice trade policies have maintained relatively stable domestic prices for these two products. This has had the effect of providing an antitrade bias within the agricultural sector. It also meant an increase during the 1970s and a decrease in the latter 1980s in the country’s antiagricultural bias. More recently, the completion of agricultural market reforms, toward liberalized rice trade in the late 1990s and the privatization of groundnut processing in the 2000s, has led to a somewhat smaller level of distortion now than existed before the mid-1980s.

The unwinding of Senegal’s colonial institutions has been among the slowest in Africa, extending over more than 40 years. Senegalese incomes fell significantly over the first half of that period, but there was no sudden growth collapse and no countrywide civil strife. A continuous practice of electoral democracy has been maintained, with peaceful transfers of political power. This remarkable political achievement, together with the establishment of new institutions for competitive markets in agriculture and throughout the economy, provides a potentially strong foundation for sustained economic growth in the future. It will take decades for the

country to overcome the legacy of widespread malnutrition and low agricultural productivity, but with open trade policies and macroeconomic stability, there is now the opportunity for new investments in both the private and public sectors that could have a dramatic payoff in reduced poverty and economic growth.

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BENIN, BURKINA FASO, CHAD, MALI, AND TOGO

*John Baffes**

Following decades of development efforts, cotton became the dominant cash crop in most countries of West and Central Africa (WCA). Apart from suitable agroclimatic conditions, the increase in cotton production is believed to have reflected the vertically integrated structure of the cotton industry—similar in all WCA cotton-producing countries—which circumvented the free-riding risks that would have otherwise constrained its performance.

The WCA cotton sectors share a number of similarities. The industries were pioneered by the French state-owned company CFDT (*Compagnie Française de Développement des Fibres Textiles*)—renamed DAGRIS (*Développement des Agro-Industries du Sud*) in 2001—in conjunction with national state-owned cotton companies.¹ Initially, cotton was used to supply the French textile industry. The cotton companies had a legal monopsony in cotton buying, and most had a monopoly on primary processing, marketing, and input supply. Typically, the companies would announce a panterritorial base buying price before planting, sometimes supplementing that price with a second payment (payable in the following season as a bonus) based on the company's financial health. Throughout the 1980s and 1990s, several attempts were made to change the ownership, management structure, and the pricing mechanisms of the cotton companies, but the panterritorial and panseasonal pricing along with the heavy government involvement in the sector remained the key characteristics of the sectors all along.

* The author would like to thank Kym Anderson for providing numerous comments and suggestions on earlier drafts, Gerald Estür for providing detailed country data, and Marianne Kurzweil for performing statistical analysis.

Most cotton used to be marketed through COPACO (*Compagnie Cotonnière*), a CFDT subsidiary, but that changed during the mid-1980s when most cotton companies began marketing their cotton through independent marketing channels. The cotton industries also benefited from research carried out by the French agricultural research institute CIRAD (*Centre de Cooperation Internationale en Recherche Agronomique pour le Développement*).²

All WCA countries are also similar in that they share a common currency, the CFA franc, which is fixed against the euro. Consequently, their cotton industries (along with their other export-oriented sectors) enjoy the benefits or suffer the consequences of the euro-dollar exchange rate fluctuations. Moreover, the fact that the CFA franc is fixed against the euro often leads to episodes of misalignment. For example, the overvaluation of the CFA franc during the early 1990s adversely affected the competitiveness of the export sectors in all WCA countries, including cotton. In 1994, the CFA franc was devalued against the French franc, thus temporarily restoring the currency equilibrium and competitiveness of the cotton industries.

The objective of this chapter is to review cotton policies and reform efforts of Benin, Burkina Faso, Chad, Mali, and Togo and to examine the nature and degree of distortions to price incentives.³ The period under consideration spans 1970 to 2005. During this period, the prices received by growers in all the focus countries were remarkably stable, fluctuating between CFAF 150 and CFAF 200 per kilogram of seed cotton (in real 2000 terms). Given the high variability of world prices, the fluctuating gap between world and domestic prices reflected, for the most part, world price movements.

There have been four periods with distinct but also similar characteristics regarding incentives to cotton growers in these countries. First, from 1970 to 1984 (when the price collapse took place), the cotton sectors were heavily taxed with growers receiving about one-third of the world price (ranging as low as 30 percent in Mali). The second period, which spans 1985 through 1993 (the year before the CFA franc devaluation), was characterized by low world prices and an overvalued currency, with growers in the region receiving about half the world price. The WCA cotton companies faced severe financial difficulties toward the end of that period, and they had to be rescued repeatedly through budgetary support measures. The third period begins in 1994 and ends in 1997, when the East Asian financial crisis caused a collapse of commodity prices, including cotton. This period mirrors the first period, with a high world price and a low share received by growers (about 40 percent of the world price). Similarly, the last period, 1998 to 2005, is a mirror image of the 1985–93 period, with world prices being low, growers receiving about 60 percent of the world price, the CFA franc being (most likely) overvalued, and the cotton companies facing financial difficulties. The similarities

between the second and fourth periods extend to the consideration of policy reforms; the key difference is that during the second period, policy reforms called for restructuring the cotton companies so they would become more efficient without altering their ownership structure. In contrast, current policy reforms call for privatizing them.

The chapter concludes that when all costs are considered, including inefficiencies in the ginning operations, the sector has been taxed quite heavily, with all five countries being taxed during all periods. Consistent with the share of prices received by producers, the rates of taxation were high during 1970–84 and 1994–97 (averaging more than 40 percent) and low during 1985–93 and 1998–2005 (averaging less than 10 percent). With a few exceptions, these tax rates are remarkably similar across all countries. Note, however, that when ginning inefficiencies are not factored into the analysis, the second and fourth periods are characterized by subsidization.

The rest of the chapter begins with a discussion of the stylized facts of the cotton sector in these countries and then outlines the reasons why the reform efforts currently under consideration should be deepened. Next, summary descriptions of the history and structure of each cotton sector are presented, along with the (limited) reform efforts. Finally, the chapter makes a quantitative assessment of the price distortions involved and then draws some conclusions.

Stylized Facts

In the five WCA countries studied here, cotton provides income to nearly 1.2 million households, equivalent to some 10 million people. During 2001–03, cotton accounted for between 16 and 76 percent of the merchandise exports of these countries, and between 2.1 and 6.2 percent of their gross domestic product (GDP) (table 18.1). In three of the countries—Benin, Burkina Faso, and Mali—cotton is perhaps the single most important commercial economic activity.⁴

The performance of the cotton industries in this region has been viewed as a success story (Lele, van de Walle, and Gbetobouo 1989). Indeed, between 1970 and 1988, cotton yields grew at an annual rate of 6 percent compared with 2 percent annual growth in world yields. Yet this seemingly successful performance masked a number of weaknesses that called into question the industry's long-term sustainability. The post-1980 production increase was attributable solely to expansion of the area planted to cotton (in contrast to pre-1980 production, which reflected yield increases, mainly in response to increased fertilizer use).⁵ The WCA experience also contrasts with the 1.7 percent annual growth rate of global—and southern and eastern African—cotton output, which is attributable solely to yield increases.

Table 18.1. Summary Statistics for Cotton-Producing Countries of West and Central Africa, 2001–03

Indicator	Focus countries					Comparator countries		
	Benin	Burkina Faso	Chad	Mali	Togo	Cameroon	Côte d'Ivoire	Senegal
Country-level statistics								
Per capita GDP (constant 2000 dollars)	322	241	192	231	242	709	593	435
Per capita GNI (current PPP dollars)	1,023	1,087	987	893	1,433	1,913	1,435	1,503
Population (million)	7.7	12.0	8.8	6.2	5.7	15.5	17.3	10.9
Rural population (percent of total)	56	83	75	68	65	49	56	51
Merchandise exports (millions of dollars)	454	263	325	842	461	1,932	5,000	1,109
Cotton-related statistics								
Value of cotton exports (millions of dollars)	168	201	64	253	76	111	146	20
Cotton's export share (percent)	36.9	76.6	19.7	30.0	16.4	5.7	2.9	1.8
Cotton's contribution to GDP (percent)	4.9	5.0	2.6	6.2	4.2	0.8	1.0	0.3
Cotton's share of agricultural production valued at undistorted prices (percent, 2001–05)	4.1	4.8	2.2	3.7	4.3	4.0	2.0	1.0
Cotton production (thousand tons, lint)	152	177	59	225	68	99	139	18
Cotton area (000 hectares)	331	408	277	510	185	200	253	38
Cotton yields (kilogram/hectare, lint)	459	435	213	439	368	498	532	468
Grower price (CFAF/kilogram, seed cotton)	202	190	162	193	183	186	190	185
Average cotton plot (hectares)	1.0	1.9	1.4	2.6	1.3	0.7	1.3	0.6
Households in cotton production (thousands)	325	210	200	300	150	300	200	70

Source: Compiled by the author, using data from FAO 2006, IMF 2006, and World Bank 2006b.

The panterritorial cotton pricing mechanism is common to all WCA countries. While it delivered remarkable price predictability and stability, it also turned out to be a convenient and socially popular income redistribution mechanism, in effect transferring resources from efficient cotton growers (or growers with transportation or locational advantages) to higher-cost growers. This common price within each country has thus constrained overall growth and innovation in the industry by penalizing the most productive entities (or areas) of the sector.

Furthermore, growers received low prices even when world prices were extremely high (Baffes 2007, figures 3–10). For example, during the early 1980s, WCA cotton producers were receiving CFAF 60–70 per kilogram for their seed cotton, while the world price ranged between the equivalent of CFAF 200 and CFAF 250.⁶ Similarly, following the 1994 devaluation of the CFA franc, producer prices were adjusted upward but far less than the increase in world price, thus denying WCA cotton growers the high prices enjoyed by cotton producers elsewhere. In fact, the econometric evidence in Baffes (2007) shows practically no comovement between world prices and prices received by cotton growers in these countries. This finding is ironic considering that the various price formulas devised to determine the price to be paid to growers by the cotton companies used the world price of cotton as their starting point.

On the other hand, prices were announced early in each season. The price often reflected political considerations rather than market realities, and there was no proper hedging mechanism in place, so the cotton companies (and hence taxpayers of the respective countries or even aid agencies) assumed all the risks associated with world price and currency movements. It meant that in periods of low prices or overvalued currency (or both), most cotton companies experienced financial difficulties that in turn led to demands for fiscal transfers from government budgets, thus putting into jeopardy the fiscal position of these countries. For example, during the late 1990s, the cotton company of Mali was in no position to manage the downturn in cotton prices because the stabilization fund, created to set aside a portion of profits from earlier periods of high prices, turned out to be empty and the company ended up incurring financial losses of CFAF 56 billion (\$100 million).⁷ Eventually, the cotton company was bailed out. Similar bailouts took place in several WCA countries following the two cotton price collapses, in the mid-1980s and in the late 1990s.⁸ More recently, Burkina Faso, which was supposed to be the star cotton performer in the WCA, revealed a three-year cumulative deficit of more than €100 million.

Because of their inefficient and inflexible structure, the cotton companies were not sufficiently prepared (with improved sales strategies, price and exchange rate risk management tools, and adoption of new technologies) to respond to the changing nature of the external environment, especially the downward trend and

volatile nature of world prices—a reflection of technological changes and to some extent subsidies by some countries.⁹ For example, consider that more than one-third of global cotton output is now of genetically modified origin. Yet with the exception of Burkina Faso, none of the WCA countries has allowed even field trials to assess the likely benefits and risks of such technology.¹⁰ Furthermore, research has shown that the benefits of fully using biotechnology may be even higher than the benefits from the elimination of all cotton trade distortions (Anderson, Valenzuela, and Jackson 2008).

The fact that the CFA franc is fixed against the euro (or the French franc prior to 1999) and has been subjected to only one adjustment since 1948—from CFAF 50 to CFAF 100 per French franc in 1994—means that WCA governments have one less policy tool at their disposal. WCA cotton growers may lose (or gain) from an over (under)-valued CFA franc, and they have been adversely affected by the recent weakness of the dollar against the euro. Consider, for example, that during marketing year 2005/06 the Cotlook A Index of average cotton prices in U.S. dollars was roughly the same as it was in 2000/01. However, during the same period, the WCA currency appreciated from CFAF 731 to the U.S. dollar to CFAF 535 to the dollar, effectively reducing the world price of cotton in terms of CFA francs by 37 percent. Because it is beyond the control of an individual WCA government to choose the exchange rate regime that is consistent with the structure of its economy, the case for cotton policy reform is even stronger.

The Case for Revisiting Reform Strategies

Faced with these constraints, a number of WCA countries accepted financial and technical assistance from the donor community, especially the International Monetary Fund and the World Bank, to consider policy reforms that could return the cotton sector to a sustainable development path and ultimately increase the welfare of cotton growers. However, because the local and international press often portrayed the reforms as ideologically driven, these changes were widely viewed with suspicion and, not surprisingly, were subjected to considerable opposition from the countries themselves as well as from bilateral donors. For example, a lively debate between French and World Bank analysts on WCA cotton reforms is chronicled in ICAC (1998a, 1998b). The World Bank's views can also be found in Baffes (2001).

In a survey of the cotton sectors of Benin, Burkina Faso, and Mali, Bourdet (2004, p. 41) describes the reasons for opposition to reform:

There are two reasons behind this limited ownership [of reforms] of the home government. The first is the strong opposition on the part of the urban elite and some farmer associations in cotton-producing countries to

the privatization of the state-owned ginning enterprises, which are at the center of the network of institutions and actors composing the cotton sector. The second is the opposition of some bilateral donors, in particular France as the main bilateral donor, to the deregulation of the sector. No doubt this “lack of enthusiasm” on the part of the home government of cotton-producing countries and some bilateral donors has contributed to the slow pace and mixed outcome of reforms.

Note that the unwillingness to engage in a serious reform effort during the mid-1990s—especially after the CFA franc devaluation—reflected that cotton prices were high and hence the cotton companies did not face any financial stress while the respective governments were benefiting from the taxation.

Following the price decline that began in 1997, however, it became increasingly evident that reforming the cotton industry and allowing the private sector to undertake some of the industry’s activities was, perhaps, the only feasible way forward.¹¹ This view was slowly accepted, to various degrees, by bilateral donors as well as by the countries themselves. For example, Edwards (2000, p. 2) concluded that “it is encouraging to note that the sometimes acrimonious nature of the recent debate with regard to the future of cotton in the Francophone producing countries appears to be giving way to a more constructive dialogue, even if consensus on all issues remains elusive.” Despite the understanding and “constructive dialogue,” policy reforms have been limited, while the paths to reforms are quite diverse, as the following summary of the five countries indicates.

Reforms in Benin, which were undertaken “by function,” consist of three key elements: separation of the various links in the cotton supply chain according to the different functions (input provision and distribution, seed cotton production, transport, ginning, and trading); division of the responsibility for handling these functions among a large number of actors (except for research and extension, which was considered a semipublic good that needed to be jointly funded by the private and public sectors); and organization of the key decision-making process (including issues such as the price-setting mechanism and cotton delivery time) into horizontally organized entities, which must all agree before any sectorwide decision is made.

The reform process in Burkina Faso was undertaken “by region,” in a sense reflecting the view that free-riding risks of the cotton sector are high, especially regarding the provision of inputs (and hence credit recovery) as well as research and extension services. The market is currently structured into three regional monopsonies—a dominant state-owned company accounting for about 90 percent of cotton purchases, plus two private companies accounting for the rest.

In Chad, reforms can be characterized, perhaps, as nonexistent. Although the government of Chad announced that it would disengage from the cotton sector in

1999, with the single exception of the privatization of the cotton oil company, so far it has failed to act accordingly. Factors behind the unwillingness to reform include the fiscal difficulties of the cotton company (and hence limited interest by the private sector), the lack of ownership of reform by the government, and more recently the windfall revenue from crude oil, which has absorbed practically all capacity and energy by officials who, otherwise, would have been in charge of the reform process.

Mali, which has contemplated reforms for quite some time, reconsidered its reform commitment in July 2004 and decided to proceed cautiously by carefully assessing the pros and cons of the reform process in other WCA countries. In November 2005, the government increased its share in the capital of the cotton company (from 60 to 70 percent) and publicly announced that reforms would be delayed for several years.

In Togo, which has not undertaken any comprehensive reforms, the structure of its cotton sector is less rigid than those of the other countries. Half of Togo's cotton is privately ginned on behalf of the publicly held cotton company (the remaining is ginned by the cotton company). The government does not interfere much with the sector, neither taxing it directly nor supporting it in periods of low prices. Discussions for reforms have been held recently, but no specific action plan has been proposed.

Details of Each Country's Policies

One can safely argue that cotton reforms in WCA countries are far less advanced compared with reforms undertaken by cotton-producing countries in eastern and southern Africa. This section summarizes the structure of the cotton sectors along with the key elements and reform processes of the five focus countries.

Benin: 30 years of reform experimentation and still lots of problems

During 2001–03, cotton contributed 37 percent to total merchandise exports and almost 5 percent to GDP for Benin. An estimated 325,000 households depend on cotton cultivation, implying that the livelihoods of nearly 2 million people are directly linked to the industry's performance. The average cotton plot in Benin is about 1 hectare and the typical household produces 450 kilograms of cotton lint, generating roughly \$330 in gross annual income. Cotton in Benin is a rainfed crop. Two-thirds of cotton growers prepare their land manually, and only some use fertilizer and chemicals.

Although Benin has a long tradition in cotton cultivation, which started well before the colonial period, cotton became a commercial crop only in 1952 when

the French state-owned company CFDT introduced a high-yielding cotton variety. Following independence in 1960, the CFDT expanded its operations in northern Benin while another French state-owned company SATEC (*Société d'Aide Technique et de Coopération*) introduced cotton in central Benin. Toward the end of the 1960s numerous village associations (*Groupements Villageois*) were formed, specializing in input distribution, credit provision, and marketing.

Under the leftist regime of the 1970s, a new parastatal was created and took over all activities of the sector. In 1975, six rural development agencies were created—corresponding to the six provinces—with the responsibility of handling input supply and extension services. Responsibility for ginning operations was given to another company. Despite the changes, the sector performed dismally. During 1976–81, cotton output averaged 7,000 tons, 8,000 tons less than the corresponding average during 1970–75 (Baffes 2007, table B1). Following renewed interest by the government, all cotton-related activities were transferred in 1984 to the new parastatal SONAPRA (*Société Nationale pour la Promotion Agricole*), while numerous cotton development projects were introduced. In the meantime, the government's relationship improved with the CFDT, from whom Benin accepted limited technical assistance.

Reforms were first contemplated in the early 1990s, mainly in response to an earlier crisis. Following an exceptionally good crop, cotton output increased from 34,000 tons in 1985 to 48,000 tons in 1986. However, the existing ginning operations were unable to process all the cotton. Moreover, the decline in the world price of cotton (from \$1.52 a kilogram in 1985 to \$1.08 in 1986) coupled with the appreciation of the CFA franc (from CFAF 378 to the U.S. dollar to CFAF 316 to the dollar) combined with unchanged producer prices of CFAF 110 for a kilogram of seed cotton, caused SONAPRA to incur considerable financial losses. Under Benin's World Bank-supported structural adjustment program of 1991, the government issued a Letter of Rural Development Policy that envisaged the transfer of the management of the sector to a new entity whose operations would be based on the principles of a common guaranteed panterritorial price to producers, panterritorial prices for inputs, obligation for producers to sell their cotton to specific ginners, and obligation for ginners to buy all cotton from producers.

As a result of this policy shift, the equivalent of 20 percent of input supply activities was privatized in 1993 on a pilot basis; by 1995, 80 percent of such activities were privatized. SONAPRA eventually withdrew from the input supply market in 2000. A second step included issuing licenses to three new private ginning operations in 1995, followed by several more in 1998. That added 225,000 tons of seed-cotton ginning capacity to an existing 335,000 tons by SONAPRA. Yet, the new structure caused numerous conflicts resulting in frequent political interference.

In response, the government created a number of entities that assumed responsibilities for various aspects of the cotton industry. They included a cooperative belonging to the regional producers unions (*Coopérative d'Approvisionnement et de Gestion des Intrants Agricoles*), formed in 1998. A second entity (*l'Association Professionnelle des Egreineurs du Bénin*) was created in 1999 with key responsibility for coordinating activities among ginneries. Another organization (*l'Association Interprofessionnelle du Coton*) was established in 1999 to manage supply chain-related functions. Finally, a fourth organization (CSPR, or *Centrale de Sécurisation des Paiements et de Recouvrement*) was formed in 2000 with the mandate to recover debts from growers, collect and deliver cotton to ginneries, and make payments to producers.

Despite the creation of all these organizations and associations, it appears that the performance of the sector has not improved. During the 2003–04 season, private traders bought one-quarter of the seed cotton, which meant that those farmers who sold to the independent traders escaped the credit recovery scheme set up by CSPR. Consequently, tensions among different actors escalated. The difficulties faced by the sector can be gauged by the sharp decline in cotton production from 171,000 tons of lint in 2004–05 to 82,000 tons in 2005–06.

Burkina Faso: The implosion of a star performer

Cotton is the most important cash crop in Burkina Faso, accounting for almost two-thirds of total merchandise exports and contributing 5 percent to the country's GDP in 2001–03. The sector provides income to an estimated 210,000 households, implying that as many as 1.5 million people are affected by the industry. The average cotton plot in Burkina Faso is a little less than 2 hectares.

Cotton was introduced in Burkina Faso toward the end of the colonial period. The development of the sector was the responsibility of the CFDT, which remained in charge until 1975, when it was replaced first by a joint venture between the government and the CFDT and in 1979 by a new cotton parastatal company, SOFITEX (*La Société Burkinabè des Fibres et Textiles*).

Reforms were first considered in 1991, when, under a World Bank–supported structural adjustment program, it was decided that management responsibilities for the cotton sector would be transferred to growers and the cotton company. In 1998, the government reduced its stake in the cotton company by transferring 30 percent of its shares to a producer organization, UNPCB (*Union Nationale des Producteurs de Coton du Burkina Faso*), and 34 percent to DAGRIS (formerly CFDT). As a second step, a 12-member committee was formed in 1999 to coordinate the functions of SOFITEX and UNPCB for activities such as determination of the farmgate and input prices and management of the research program. The

committee's representation consists of seven producers, three SOFITEX representatives, and two government representatives. The third step involved the introduction of two private companies in 2004 with exclusivity zones for eight years, representing about 15 percent of cotton production—the two companies are SOCOMA (*Société Cotonnaire du Gourma*) and FASE COTON. In 2006, an umbrella organization was created to coordinate the actions of all three cotton companies.

Until very recently, the reform process in Burkina Faso was considered a success compared with other WCA cotton-producing countries. In fact, Agence Française Développement (2004, p. 1) produced a report noting that “Burkina Faso developed its cotton sector in an original homegrown way. Now one of the world's most competitive cotton industries, it has modern tools and institutions to sustain its development.” Indeed, between 1995 and 2005, cotton output in Burkina Faso increased fivefold, from 64,000 tons to almost 300,000 tons (Baffes 2007, table B2). Moreover, Burkina Faso is the only country in Sub-Saharan Africa (apart from South Africa) that is in the process of introducing genetically modified cotton.

Yet, the expansion of the sector along with the drying up of the cotton stabilization fund, as well as the recently revealed €110 million, three-year cumulative deficit, may call into question the sector's long-term sustainability. Furthermore, it appears that despite the entrance of private ginneries as well as the restructuring of the ownership of SOFITEX, the government is still the key decision maker in the sector. To address the crisis, the cotton companies and the producers agreed to a new pricing formula as of March 2006. The pricing formula is part of a newly established smoothing fund (*fonds de lissage*)—to be distinguished from the earlier stabilization fund (*fonds de soutien*). The smoothing fund is expected to be professionally managed on agreed and easily monitored parameters (such as world price and exchange rate). However, as is the case with all stabilization funds, there is always the risk of running large deficits if adverse prices or exchange rate conditions persist for long.

Chad: Windfall oil revenue shelves cotton reform

Chad's cotton sector is a major part of the economy, contributing 20 percent to total merchandize exports and 2.4 percent to GDP in 2001–03. The sector is the key source of income to some 200,000 households (or as many as 350,000 according to some sources); with an average household size of 5–6 people, this amounts to 1.2–1.4 million people. The average cotton plot is about 1.5 hectares. Chad's cotton yields are very low, even by WCA standards (about half the yields in Benin or Burkina Faso).

Cotton cultivation was introduced in 1928 under forced-labor conditions—Chad was the first WCA country to cultivate cotton. Production grew steadily to 40,000 tons during the early 1960s, making Chad the leading cotton producer in the WCA. During 1970–75, Chad’s cotton output averaged 46,000 tons of cotton lint, almost twice as much as Mali’s average of 25,000 tons and three times as much as Benin’s and Burkina Faso’s averages of 15,000 tons each.

The cotton company of Chad—Cotonchad—was created in 1971, replacing the earlier parastatal, Cotonfran. The government is the majority shareholder (75 percent), followed by DAGRIS (19 percent) and the local private banking sector (6 percent). The key missions of Cotonchad were (and still are) to distribute inputs, purchase and gin seed cotton, and trade cotton through its commercial offices in Paris. Cotonchad faced serious difficulties during the price decline of 1985, which were further exacerbated by a drought during that year. Production declined from 60,000 tons in 1983–84 to 36,000 tons in 1984–85. It took the sector five years to return to earlier levels of output.

However, Cotonchad’s financial stress, the heavy taxation by the government, along with civil war and a war with Libya, imposed a heavy burden on the sector (Azam and Djimtoingar 2004). For example, prices paid to cotton growers fluctuated at the low level of CFAF 80–100 between 1983 and 1993 (Baffes 2007, table B4). The 1994 devaluation provided temporary relief to the sector, as prices paid to growers increased gradually from CFAF 90 in 1993 to CFAF 195 in 1997 (cotton output exceeded 100,000 tons that year). However, the boom was short-lived—world price declines along with mismanagement of the sector and heavy taxation soon forced Cotonchad to reduce the grower price to CFAF 160.

In response to these developments, the government set up a Cotton Sector Reform Committee in 1999 to evaluate likely reform strategies. The committee’s primary focus was on improving the incomes of cotton farmers through liberalizing the sector along with improving the performance of producer organizations. In 2002, the Cotonchad-owned factory that made oil and soap was privatized, but that was the only policy reform. The government, together with Cotonchad, organized a workshop in April 2004 in Ndjamena to find ways to improve the financial situation of Cotonchad and boost cotton production. However, undertaking deeper reforms was not placed high on the agenda.

Since then, the momentum for reforms has weakened even further following the country’s windfall revenue from crude oil; not surprisingly, the cotton reform agenda has been affected in two interrelated ways. First, crude oil has displaced cotton as the key source of income for the government. Consider, for example, that during 2007, the export earnings from cotton were expected to be less than \$70 million, just a fraction of oil revenue, which was expected to reach \$1.2 billion—\$930 million from taxes and \$250 million from royalty fees. Second,

increased activity in the crude oil sector has left officials with little time or energy to address reforms in the cotton sector.

Mali: Not wanting to engage in reforms

Cotton is Mali's most important cash crop. During 2001–03, it contributed 30 percent to total merchandise exports and more than 6 percent to the country's GDP. An estimated 300,000 households depend on the crop, which implies that as much as one-third of Mali's population is affected by the sector's performance. The average cotton plot in Mali is 2.6 hectares. As is the case with other WCA countries, cotton is a rainfed crop, and most of the land is prepared manually. Cotton is typically rotated with food crops such as millet, sorghum, maize, and groundnuts.

Cotton was introduced in Mali during the late 1940s by the CFDT, which continued its involvement even after independence in 1960. A national cotton company, the CMDT (*Compagnie Malienne pour le Développement du Textile*), was formed in 1974 as a joint venture between the government (60 percent) and the CFDT (40 percent). The CMDT has played a key role in the ownership, management, and control of the various components in the supply chain, including the cotton-oil-processing sector. It has also assumed responsibility for rural development, particularly road maintenance and some extension services in the major cotton-growing areas. In addition to the CMDT, another regional organization, *Office de la Haute Vallée du Niger*, has been involved in the cotton sector since 1970. This organization was allocated a specific part of the country in which to operate and has responsibility for the promotion of all crops. It is involved in all cotton production activities but not in ginning; instead it pays the CMDT, which currently owns and operates two ginneries in the organization's zone, for the ginning.

The first comprehensive review of the cotton sector in Mali was undertaken in 1989, and to a large degree the sector's current institutional setting reflects that review.¹² The key steps taken in 1989, which were supported by the donor community, included financial autonomy for the CMDT, the introduction of a minimum producer price, and establishment of a stabilization fund. The CMDT's weak management, along with the 1999 decline of cotton prices, resulted in a financial crisis. In response, the CMDT set a low price for the 2000–01 season, causing many growers to abandon cotton cultivation. Cotton output declined from 197,000 tons in 1999–2000 to 102,000 tons in 2000–01 (Baffes 2007, table B6). Faced with these difficulties, the government prepared a comprehensive restructuring plan (*Lettre de Politique de Développement du Secteur Coton*), which envisaged reforming the CMDT's institutional arrangements in order to restore the competitiveness of the sector and ultimately foster broad-based growth. The

poor financial shape of the CMDT, however, has persisted. Between 1997 and 2004, it generated profits only twice, while the losses in 2005 alone amounted to some CFAF 48 billion (\$91 million).

Togo: Lots of problems

Cotton is Togo's second largest primary commodity export after phosphate fertilizer. It contributed 16 percent to export earnings and 4.2 percent to GDP in 2001–03. Togo's cotton production is in the same range as that of Chad: during 2001–03, it averaged 68,000 tons. Its yields, however, are much higher than in Chad but lower than in Benin, Burkina Faso, and Mali.

Cotton was introduced in Togo relatively recently. For example, during the early 1970s, cotton production averaged only 2,000–3,000 tons. In 1974, the state-owned company SOTOCO (*Société Togolaise de Coton*) began its operations by handling most of the input supply and marketing activities as well as research, extension, and maintenance of the road network (World Bank 1988). Production increased significantly after the 1980s and exceeded 50,000 tons following the 1994 devaluation (Baffes 2007, table B8).

Togo's cotton sector differs from the other WCA countries in that, following the purchase of cotton, half of the crop is sold to three private ginneries at a price equal to the price paid to the producers plus marketing and transportation costs. The share of cotton delivered to each ginnery is fixed, set in proportion to its ginning capacity. While Togo's cotton sector was affected by the late-1990s decline in prices, SOTOCO responded quickly by cutting down operating costs and reducing the prices paid to growers. That was the only feasible alternative because no stabilization fund was in place to cover losses, and the government's tight financial situation did not allow any budgetary support (IMF 2003). However, the recent price declines appear to have derailed the sector's performance. During 2005–06, cotton production dropped to 28,000 tons, less than half of the decade's average.

Estimating Distortions to Cotton Sector Incentives

The task of quantifying the distortions to cotton sector incentives in the WCA contains elements of both simplicity and complexity. The simple part reflects the presence of a well-defined world price indicator, the Cotlook A Index, one component of which is WCA cotton (Baffes 2007, appendix A). Because the price of WCA cotton tracks the A Index very closely, one can use it as the world price benchmark.¹³ Second, all WCA cotton companies pay panterritorial and panseasonal prices, making it easy to calculate the gap between the world price and prices

received by growers. Third, almost all cotton is exported and hence there is no need to deal with domestic marketing distortion issues. Fourth, most of the value of cotton comes from cotton lint, so calculating the distortion to cotton lint, to a large extent, captures the distortions in the entire cotton market. Last, the rate of conversion (that is, the ginning ratio) between the farm product (seed cotton) and the internationally traded commodity (cotton lint) is a well-known parameter and very similar across countries and years.

Nonetheless, quantification of the distortions is a complex task for several reasons. First, in addition to explicit taxation, the governments “used” the profits from the cotton companies for a number of other activities without explicitly documenting the financial transactions. Second, in periods of low prices when the national cotton companies incurred losses, the governments would rescue them through budgetary transfers. Third, and most important, numerous inefficiencies are inherent in the value chain—especially ginning—making it difficult to distinguish between inefficiencies and taxation. Fourth, the cotton companies often transferred resources to producers through the provision of public services, such as construction and maintenance of rural roads, which again are very difficult to quantify.

The rest of this section examines distortions to cotton prices, calculated using the methodology of Anderson et al. (2008) to show nominal rates of assistance (NRA) to cotton farmers for the five focus countries, taking into account international and domestic transportation costs as well as ginning costs. The NRAs are expected to vary widely over time, because new econometric evidence shows that the domestic cotton price bears little resemblance to prices in the international marketplace (Baffes 2007).¹⁴

Quantifying the distortions requires three calculations and subsequent adjustments to the world price of cotton. First, the free on board (fob) price for exports and the cost, insurance, and freight (cif) cost of imports are calculated; these are common to all WCA countries. The A Index adjustment by the cif-to-fob costs consists of two components: international freight rates—costs from the export port to the final destination port— and marketing charges. International freight rates are very similar regardless of the port of origin (Baffes 2007, table B9). Marketing charges are standard charges across the industry, representing 3 percent of the A Index until 2002–03 and 2.6 percent after that. These two costs account for an average of 8 percent of the A Index.

The second calculation involves domestic transport costs, which differ substantially between landlocked countries and countries with access to seaports (Baffes 2007, table B10). For example, in 2005–06, the costs of transporting 1 kilogram of cotton lint from Chad to the port of Douala in Cameroon was CFAF 100, whereas transportations costs were less than half of that for Benin, Senegal, and Togo, which have easier access to seaports.

The third calculation concerns ginning costs, which ranged between CFAF 50 for a kilogram of cotton lint in the early 1970s to more than CFAF 200 after the mid-1990s (Baffes 2007, table B9). These figures represent the costs as they are reported in the financial statements of the cotton companies, which are characterized by numerous inefficiencies, and consequently do not reflect the costs of ginning under free market conditions. To obtain the true costs of ginning, these reported costs must be adjusted downward. Analysis performed during 2005 found that the actual ginning costs during that year were 18 percent lower than the amounts the cotton companies reported.¹⁵ However, it is believed that in earlier years, the true ginning costs were much lower, because the companies could finance public good activities (such as road maintenance). Hence, the adjustment factor used to estimate the actual ginning costs was 25 percent, that is, ginning costs are assumed to be 25 percent lower than what is reported.

Specifically, the NRA for period t is calculated as follows:

$$NRA_t = \{P_t^D / [(P_t^W - C_t^F)R_t - C_t^I - C_t^G]\} - 1,$$

where P_t^D denotes the price received by cotton growers, P_t^W denotes the A Index price; C_t^F denotes freight rates and marketing charges; R_t denotes the CFAF/\$ March-to-July average bilateral exchange rate, consistent with the WCA cotton-marketing season; C_t^I denotes inland transport costs; and C_t^G denotes actual ginning costs (including farm-to-ginnery transport costs). This calculation of the NRA is consistent with the distortion taking place at farmgate level (that is, a production tax), a specification chosen on the basis that the cotton companies become the owners of seed cotton at the farmgate level. The price data (in constant 2000 terms) are summarized in table 18.2, along with their ratio (the grower price as a percentage of the A Index price). These confirm the earlier assertion that the producers' share has been low during the first (1970–84) and third (1994–97) periods and much higher during the second period when international prices were low (1985–93) and the fourth period (1998–2005).

The estimates in table 18.3 report the NRAs when all costs are taken into consideration (that is, freight rates and inland transport costs as well as ginning costs and the “inefficiency” factor). They reveal that cotton growers in the focus countries were taxed, on average, by 50 percent during 1970–84. That tax was reduced to 25 percent on average in the 1990s (although during 1985–89 it was only 8 percent), before the taxation was largely removed; it averaged less than 4 percent after 1998. The heaviest taxation took place in Mali, where during 1970–84 and the 1990s, farmers were taxed at average rates of 57 and 29 percent, respectively, but the rates were not much less in the other focus countries.

Finally, the variability of prices farmers received versus international prices has also been examined. This is done using the Z -statistic (because prices are

Table 18.2. Cotton Price Statistics, West and Central African Countries, 1970–2005

Indicator	Benin	Burkina Faso	Cameroon	Chad	Côte d'Ivoire	Mali	Senegal	Togo
Cotlook A Index (constant 2000, CFAF/kilogram of seed cotton)								
1970–84	532	438	508	405	639	585	506	532
1985–93	380	290	284	326	392	329	289	345
1994–97	503	466	445	468	497	465	467	478
1998–2005	309	304	322	291	312	298	316	303
Prices received by cotton growers (constant 2000, CFAF/kilogram of seed cotton)								
1970–84	195	146	208	134	282	172	171	188
1985–93	209	148	178	170	204	156	156	179
1994–97	218	176	198	183	204	168	199	204
1998–2005	190	177	176	161	178	170	183	177
Producer's share of Cotlook A Index (percent)								
1970–84	38	35	42	34	45	30	35	37
1985–93	56	52	64	53	53	49	55	53
1994–97	45	39	44	40	42	37	43	43
1998–2005	62	59	59	56	57	59	59	59
Price variability (Z statistic)								
Cotlook A Index	124	116	111	96	150	130	115	135
Domestic	18	19	24	18	26	22	13	19
Ratio ^a	7	6	5	5	6	6	9	7

Source: Baffes 2007, table 7.

a. This ratio is the ratio of the Z statistic of the Cotlook A Index price to that of the domestic price, where the Z statistic is the square root of the average squared deviation of the price from its value lagged one period (or the first difference in the price; see Schiff and Valdes 1992, appendix 3-2). For example, for Benin the year-to-year variability of the world price has been seven times higher than the year-to-year variability of the price received by cotton growers (both prices having been expressed in domestic currency and in real terms using the GDP deflator).

Table 18.3. NRAs for Cotton Growers, Benin, Burkina Faso, Chad, Mali, and Togo, 1970–2005*(percent)*

Country	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–05
Benin	–44	–49	–49	–5	–24	–22	–6
Burkina Faso	–44	–48	–58	–8	–26	–28	1
Chad	–47	–48	–52	6	–21	–21	–3
Mali	–56	–55	–59	–17	–25	–33	3
Togo	–41	–46	–60	–14	–25	–24	–13
Unweighted average	–46	–49	–56	–8	–24	–26	–5

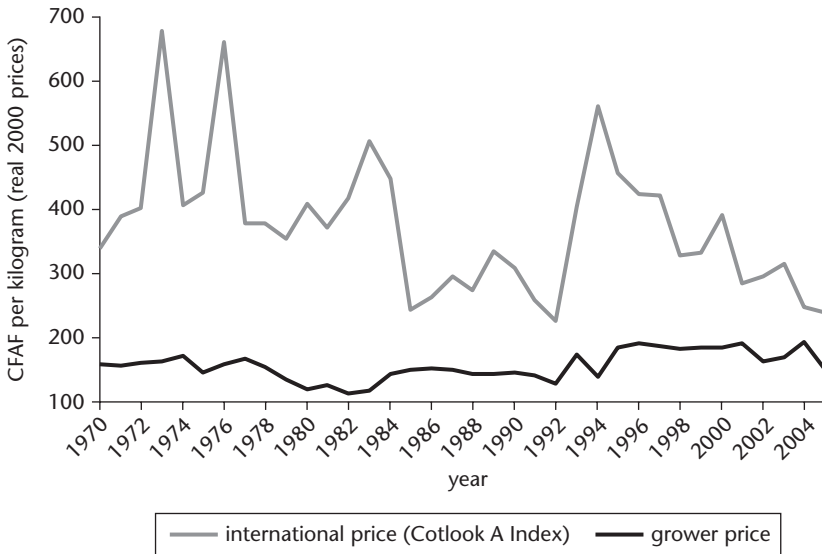
Source: Baffes 2007.

nonstationary and hence measures such as standard deviation may give misleading results), which is the square root of the average squared deviation of the price from its value lagged one period (or the first difference in the price). The results are summarized in the fourth panel of table 18.2. They indicate that the world prices have been, on average, five to seven times more volatile than domestic prices in year-to-year variation. This finding simply confirms that the price-setting mechanism in the focus countries has indeed stabilized the domestic price of cotton—albeit at a very low level until recently—compared with prices in the international market, as is illustrated in figure 18.1 for Burkina Faso, the most populous of the focus countries.

Conclusion

This study of incentives to WCA African cotton growers is divided into four sub-periods. During 1970–84, cotton growers in the five focus countries effectively received only half what they would have received under free-market conditions. During the second period, 1985–93, even though the average tax rate fell to only 13 percent, the cotton companies faced severe financial difficulties because of the crash in international prices, and they had to be rescued repeatedly through budgetary support measures. In the third period, which begins with the devaluation of the CFA franc in 1994 and ends with the beginning of the next price decline in 1997, the sectors were taxed, on average, by 35 percent. During the last period, 1998 to 2005 (which in many ways is a mirror image of the 1985–93 period), cotton growers were taxed, on average, at 4 percent. Note that the last period was characterized by low world prices (see figure 18.1), the CFA franc being (most likely) overvalued, and most cotton companies facing financial difficulties. It is thus not out of the question that taxation rates could rise again in a future period of high international prices.

Figure 18.1. International Price and Grower Price for Cotton, Burkina Faso, 1970–2005



Source: Baffes 2007, based on data from SOFITEX and the World Bank's commodity price series.

Notes

1. In addition to their core activity, which is ginning, the cotton companies often engaged in numerous other activities such as input distribution, provision of research and extension services, and maintenance of rural roads. Detailed data and estimates of distortions reported in this chapter can be found in Baffes (2007).

2. See Baffes (2007, table 1) for key institutions involved in the cotton sectors of WCA countries.

3. Together with Cameroon, Côte d'Ivoire, and Senegal, these countries account for 99 percent of WCA cotton output and about 3.5 percent of global cotton production. Cotton produced by WCA countries Cameroon, Côte d'Ivoire, and Senegal is analyzed elsewhere in this volume in separate chapters (chapters 13, 14 and 17), and those countries are also included in a fuller comparative analysis in Baffes (2007). Three minor WCA cotton producers not included here are Central Africa Republic, Guinea, and Niger.

4. In all five countries, cotton is not a large share of the overall value of agricultural production when subsistence crops are taken into account. Nontradable grains and tubers are crucial sources of carbohydrates for the poor, food-insecure farm families in these countries, with cassava, millet, sorghum, and yams accounting for between 30 and 55 percent of the value of their farm production.

5. A growth decomposition analysis for the 1980–2005 period reveals that cotton yields in WCA countries remained (statistically) stagnant (Baffes 2007).

6. Cotton refers to cotton lint, sometimes called cotton fiber (the internationally traded commodity). When reference to seed cotton (the farm product) is made, it is explicitly mentioned. The rate of conversion from seed cotton to cotton lint—the ginning outturn ratio—is currently about 42 percent

in all WCA countries, that is, 1 kilogram of seed cotton produces 0.42 kilograms of cotton lint and 0.58 kilograms of seeds, which, in turn, are transformed into cotton oil and cotton cake.

7. Despite the poor performance of price stabilization funds and supply controls (Gilbert 1996), there have been renewed calls for such mechanisms. See, for example, discussions in Ravry et al. (2006) and OXFAM (2007). The failure of stabilization mechanisms should not be surprising if one considers that during the seven 12-month intervals between March 1995 and March 2002, cotton prices declined six times and remained at the same level once, without experiencing any increase. Under such circumstances, any stabilization fund is likely to go bankrupt no matter how well it is run. Conversely, if prices experience continued increases—a less likely scenario considering their long-term downward trend—the stabilization fund is likely to be subject to misuse, as was the case in several WCA countries.

8. The 1985 cotton price collapse was a result of a policy shift in U.S. commodity programs (including cotton). It also reflects a policy shift in China that favored cotton production there. The decline in the late 1990s reflects the East Asian financial crisis, again common to most commodities. Nevertheless, cotton has not been part of the recent price boom, with the likely reasons reflecting a combination of the following: cotton subsidies continue to depress prices considerably; productivity gains from genetically modified cotton and other technological advances have kept production costs low compared with other commodities; and the price increase in the overall commodity price index stems from the increasing demand for certain commodities for biofuels production (such as maize and sugarcane for ethanol and rapeseed for biodiesel).

9. For a review of the distortions in the global cotton market, see Baffes (2005). The U.S. cotton subsidies were subject to a WTO (World Trade Organization) case brought by Brazil (Schnepf 2004). Benin, Burkina Faso, Chad, and Mali also brought a case to the WTO demanding compensation from the countries that subsidize their cotton sectors (see Sumner 2006 and Anderson and Valenzuela 2007).

10. Under the West Africa Regional Biosafety Program, a \$23.4-million World Bank technical assistance operation, the members of the West African Economic and Monetary Union are expected to establish national and regional biosafety policies and procedures to ensure proper assessment of the risks and benefits of biotechnology products (World Bank 2006a).

11. Reform strategies in the WCA have been discussed in various contexts. See, for example, Pursell (1998), Badiane et al. (2002), Goreux (2004), and Baghdadli (2006).

12. Developments in the Malian cotton sector were also influenced by an uprising by cotton farmers in the early 1990s (Bingen 1998).

13. In a study that examined the comovement of the various components of the A Index as well as the comovement between the A Index and its components, Baffes and Ajwad (2001) found that the WCA cotton prices tracked the A Index very closely.

14. An econometric model was used in Baffes (2007) to estimate the degree to which world price movements influence the domestic price determination mechanism in the five focus countries as well as in Cameroon, Côte d'Ivoire, and Senegal. Only in those latter three countries (where cotton is less important to the economy than in the five focus countries) was the domestic-world price link significant.

15. Personal communication with Gerald Estùr, March 16, 2007.

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METHODOLOGY FOR MEASURING DISTORTIONS TO AGRICULTURAL INCENTIVES

*Kym Anderson, Marianne Kurzweil, Will Martin,
Damiano Sandri, and Ernesto Valenzuela**

This appendix outlines the methodological issues associated with the task of measuring the impact of government policies on incentives faced by farmers and food consumers. The focus is on those border and domestic measures that arise exclusively from government actions, that, as such, may be altered by a political decision, and that have an immediate effect on consumer choices, producer resource allocations, and net farm incomes. Most commonly, these measures include import or export taxes, subsidies, and quantitative restrictions, supplemented by domestic taxes or subsidies for farm outputs or inputs, and consumer subsidies for food staples. The incentives faced by farmers are affected not only by the direct protection or taxation of primary agricultural industries, but also indirectly via policies assisting nonagricultural industries, given that the latter may have an offsetting effect by drawing resources away from farming. This appendix begins by outlining what theory suggests should be measured directly and indirectly. It then outlines the way the theory is put into practice through this study.

* Thanks for invaluable comments are due to many project participants, including Bruce Gardner, Tim Josling, Will Masters, Alan Matthews, Johan Swinnen, Alberto Valdés, and Alex Winter-Nelson, plus Ibrahim Elbadawi. The information in this appendix is also available in Anderson et al. 2008a and 2008b.

What, According to Theory, Should Be Measured

The key objective of this study—obtaining a long time series on a wide range of countries that are at different stages of development—requires that the indicators be simple. If the indicators are simple, this also means that it would be easier to update the indicators subsequently for policy monitoring. Throughout, we have followed the concept of Bhagwati (1971) and Corden (1997) whereby a market policy distortion is, by definition, imposed by a government to create a gap between the marginal social return to a seller and the marginal social cost to a buyer in a transaction. The distortion creates an economic cost to society that may be estimated using welfare measurement techniques such as those pioneered by Harberger (1971). As Harberger notes, this focus allows for great simplification in the evaluation of the marginal costs of a set of distortions: changes in economic costs may be evaluated by taking into account the changes in volumes directly affected by the distortions and ignoring all other changes in prices. In the absence of divergences such as externalities, the measure of a distortion is the gap between the price paid and the price received, irrespective of whether the level of these prices is affected by the distortion.

Other developments that change the incentives facing producers and consumers may include flow-on consequences of the distortion, but these should not be confused with the direct price distortion that we aim to estimate. If, for instance, a country is large in world trade for a given commodity, the imposition of an export tax may raise the price in international markets, thereby reducing the adverse impact of the distortion on producers in the taxing country. Another flow-on consequence is the effect of trade distortions on the real exchange rate, which is the price of traded goods relative to nontraded goods. Neither of these flow-on effects is of immediate concern, however, because, if the direct distortions are accurately estimated, they may be incorporated as price wedges into an appropriate country or global economy-wide computable general equilibrium model, which, in turn, will be able to capture the full general equilibrium impacts (inclusive of the real exchange rate effects) of the various direct distortions to producer and consumer prices.

Importantly, the total effect of distortions on the agricultural sector will depend not only on the size of the direct *agricultural* policy measures, but also on the magnitude of distortions generated by direct policy measures that alter the incentives in *nonagricultural* sectors. It is the *relative* prices and, hence, the relative rates of government assistance that affect producer incentives. In a two-sector model, an import tax has the same effect on the export sector as an export tax: this is the Lerner (1936) symmetry theorem. This carries over to a model that has many sectors and is unaffected if there is imperfect competition domestically or internationally or if some of the sectors produce only nontradables (Vousden 1990). The symmetry theorem is

therefore also relevant in the consideration of distortions *within* the agricultural sector. In particular, if import-competing farm industries are protected, such as through import tariffs, then this has similar effects on the incentives to produce exportables as does an explicit tax on agricultural exports; and, if both measures are in place, this represents a double imposition on farm exporters.

In what follows, we begin by focusing on direct distortions to agricultural incentives before turning to those distortions affecting the sector indirectly through nonagricultural policies.

Direct agricultural distortions

Consider a small, open, perfectly competitive national economy that encompasses many firms producing a homogeneous farm product with only primary factors. In the absence of externalities, processing, and producer-to-consumer wholesale marketing, plus retail marketing margins, exchange rate distortions, and domestic and international trading costs, such a country would maximize national economic welfare by allowing both the domestic price of the farm product and the consumer price of the farm product to equal E , times P , where E is the domestic currency price of foreign exchange, and P is the foreign currency price of the identical product in the international market. Thus, any government-imposed diversion from this equality, in the absence of any market failures or externalities, would be welfare-reducing in the small economy.

Price-distorting trade measures at the national border

The most common distortion is an ad valorem tax on competing imports (usually called a tariff), t_m . Such a tariff on imports is the equivalent of a production subsidy and a consumption tax, both at rate t_m . If this tariff on the imported primary agricultural product is the only distortion, its effect on producer incentives may be measured as the *nominal rate of assistance* (NRA) to farm output conferred by the border price support, (NRA_{BS}), which is the unit value of production at the distorted price, less its value at the undistorted free-market price expressed as a fraction of the undistorted price, as follows:¹

$$NRA_{BS} = \frac{E \times P(1 + t_m) - E \times P}{E \times P} = t_m \quad (\text{A.1})$$

The effect of this import tariff on consumer incentives in this simple economy is to generate a *consumer tax equivalent* (CTE) on the agricultural product for final consumers:

$$CTE = t_m \quad (\text{A.2})$$

The effects of an import subsidy are identical to those in equations (A.1) and (A.2) for an import tax, but t_m would have a negative value in that case.

Governments sometimes also intervene through an export subsidy, s_x (or an export tax, in which case s_x would be negative). If this is the only intervention, then:

$$NRA_{BS} = CTE = s_x. \quad (A.3)$$

If any of these trade taxes or subsidies are specific rather than ad valorem (for example, US\$ per kilogram rather than z percent), the ad valorem equivalent may be calculated using slight modifications of equations (A.1), (A.2), and (A.3).

Domestic producer and consumer price-distorting measures

Governments sometimes intervene through a direct production subsidy for farmers, s_f (or a production tax, in which case s_f is negative, including through informal taxes in kind by local and provincial governments). In that case, if only this distortion is present, the effect on producer incentives may be measured as the NRA to farm output conferred by the domestic price support (NRA_{DS}), which is as above except that s_f replaces t_m or s_x , but the CTE is zero in this case. Similarly, if the government imposes only a consumption tax, c_c , on this product (or a consumption subsidy, in which case c_c is negative), the CTE is as above except that c_c replaces t_m or s_x , but the NRA_{DS} is zero in this case.

The combination of domestic and border price support provides the total rate of assistance to output and domestic consumer tax equivalent:

$$NRA_o = NRA_{BS} + NRA_{DS}, \quad CTE = NRA_{BS} + c_c. \quad (A.4)$$

What if the exchange rate system is also distorting prices?

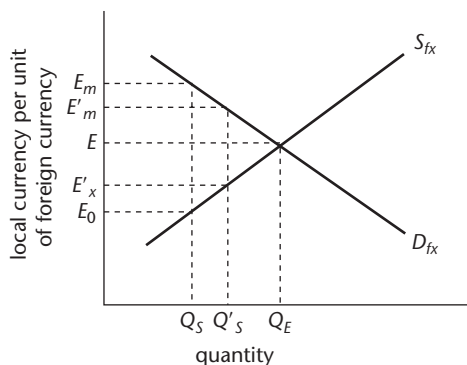
Should a multitier foreign exchange rate regime be in place, then another policy-induced price wedge exists. A simple two-tier exchange rate system creates a gap between the price received by all exporters and the price paid by all importers for foreign currency, thereby changing both the exchange rate received by exporters and the exchange rate paid by importers relative to the equilibrium rate, E , that would prevail without this distortion in the domestic market for foreign currency (Bhagwati 1978).

Exchange rate overvaluation of the type we consider here requires controls by the government on current account transfers. A common requirement is that exporters surrender their foreign currency earnings to the central bank for exchange to local currency at a low official rate. This is equivalent to a tax on exports to the extent that the official rate is below the level of the exchange rate in a market without government intervention. This implicit tax reduces the incentive of exporters to

export and, hence, the supply of foreign currency flowing into the country. With less foreign currency, demanders are willing to bid up the purchase price. This provides a potential rent for the government that may be realized by auctioning off the limited supply of foreign currency extracted from exporters or creating a legal secondary market. Either mechanism will create a gap between the official and parallel rates.

Such a dual exchange rate system is depicted in figure A.1, in which it is assumed that the overall domestic price level is fixed, perhaps by holding the money supply constant (Derviř, de Melo, and Robinson 1981). The supply of foreign exchange is given by the upward sloping schedule, S_{fx} , and demand by D_{fx} , where the official exchange rate facing exporters is E_0 and the secondary market rate facing importers is E_m . At the low rate, E_0 , only Q_S units of foreign currency are available domestically, instead of the equilibrium volume Q_E that would result if exporters were able to exchange, at the equilibrium rate, E units of local currency per unit of foreign currency.² The gap between the official and the secondary market exchange rates is an indication of the magnitude of the tax imposed on trade by the two-tier exchange rate: relative to the equilibrium rate, E , the price of importables is raised by $e_m \times E$, which is equal to $(E_m - E)$, while the price of exportables is reduced by $E_x \times E$, which is equal to $(E - E_0)$, where e_m and e_x are the fractions by which the two-tier exchange rate system raises the domestic price of an importable and lowers the domestic price of an exportable, respectively. The estimated division of the total foreign exchange distortion between an implicit export tax, e_x , and an implicit import tax, e_m , will depend on the estimated elasticities of supply of exports and of demand for imports.³ If the demand and supply curves in figure A.1 had the same slope, then $e_m = e_x$ and $(e_m = e_x)$ is the secondary market premium or proportional rent extracted by the government or its agents.⁴

Figure A.1. A Distorted Domestic Market for Foreign Currency



Sources: Martin 1993. See also Derviř, de Melo, and Robinson 1981; Kiguel and O'Connell 1995; Kiguel, Lizondo, and O'Connell 1997; Shatz and Tarr 2000.

If the government chooses to allocate the limited foreign currency to different groups of importers at different rates, this is called a multiple exchange rate system. Some lucky importers may even be able to purchase foreign currency at the low official rate. The more that is allocated and sold to demanders whose marginal valuation is below E_m , the greater the unsatisfied excess demand at E_m , and, hence, the stronger the incentive for an illegal or black market to form and for less-unscrupulous exporters to lobby the government to legalize the secondary market for foreign exchange and to allow exporters to retain some fraction of their exchange rate earnings for sale in the secondary market. Providing a right to exporters to retain and sell a portion of foreign exchange receipts increases their incentives to export and thereby reduces the shortage of foreign exchange and, thus, the secondary market exchange rate (Tarr 1990). In terms of figure A.1, the available supply increases from Q_S to Q'_S , bringing down the secondary rate from E_m to E'_m , such that the weighted average of the official rate and E'_m received by exporters is E'_x ; the weights are the retention rate, r , and $(1 - r)$. Again, if the demand and supply curves in figure A.1 had the same slope, then the implicit export tax and import tax resulting from this regime would each be equal to half the secondary market premium.

In the absence of a secondary market and in the presence of multiple rates for importers below E_m and for exporters below E_0 , a black market often emerges. The rate for buyers in this market will rise above E , the more the government sells its foreign currency to demanders whose marginal valuation is below E_m , and the more active the government is in catching and punishing exporters selling in the illegal market. If the black market were allowed to operate frictionlessly, there would be no foreign currency sales to the government at the official rate, and the black market rate would fall to the equilibrium rate, E . So, even though, in the latter case, the observed premium would be positive (equal to the proportion by which E is above the nominal official rate E_0), there would be no distortion. For our present purposes, since the black market is not likely to be completely frictionless, it may be considered similar to the system involving a retention scheme. In terms of figure A.1, E'_m would be the black market rate for a proportion of sales, and the weighted average of this and E_0 would be the return going to exporters. Calculating E'_x in this situation (and thereby being able to estimate the implicit export and import taxes associated with this regime) by using the same approach as in the case with no illegal market thus requires not only knowledge about E_0 and the black market premium, but also a guess about the proportion, r , of sales in the black market.

In short, if a country exhibits distortions in its domestic market for foreign currency, the exchange rate relevant for calculating the NRA_o or the CTE for a particular tradable product depends, in the case of a dual exchange rate system,

on whether the product is an importable or an exportable, while, in the case of multiple exchange rates, it depends on the specific rate that applies to the product each year.

What about real exchange rate changes?

A change in the real exchange rate alters equally the prices of exportables and importables relative to the prices of nontradable goods and services. Such a change may arise for many different reasons, including changes in the availability of capital inflows, macroeconomic policy adjustments, or changes in the international terms of trade. If the economy receives a windfall, such as a greater inflow of foreign exchange from remittances, foreign aid, or a commodity boom, the community moves to a higher indifference curve (Collier and Gunning 1998). While net imports of tradables may change in response to this inflow of foreign exchange, the domestic supply of and demand for nontradables must balance. The equilibrating mechanism is the price of nontradables. The price of nontradables rises to bring forth the needed increase in the supply of nontradables and to reduce the demand for these products so as to bring the demand into line with supply (Salter 1959).

While this type of alteration in the real exchange rate affects the incentive to produce tradables, it is quite different in two respects from the distortions in the market for foreign currency analyzed above. First, this real exchange rate appreciation reduces the incentives to produce importables and exportables to the same degree. In contrast with the case of the multiple-tier exchange rate, the appreciation does not generate any change in the prices of exportables relative to importables. Second, most such changes do not involve direct economic distortions of the type measurable using tools such as producer surplus or consumer surplus. If the government or the private sector chooses to borrow more from abroad to increase domestic spending, this may raise the real exchange rate, but such an outcome is not obviously a distortion. Moreover, the symmetric treatment of any such overvaluation during periods of high foreign borrowing would require that one take into account exchange rate undervaluation during periods of low foreign borrowing or the repayment of foreign debt. For these reasons, we do not follow Krueger, Schiff, and Valdés (1988) or Orden et al. (2007) in including deviations of real exchange rates from benchmark values unless these deviations arise from direct exchange rate distortions such as multiple-tier exchange rates.⁵

What if trade costs are too high for a product to be traded internationally?

Suppose the transport costs of trading are sufficient to make it unprofitable for a product to be traded internationally, such that the domestic price fluctuates over time within the band created by the cost, insurance, and freight import

price and the free on board export price. Then, any trade policy measure (t_m or s_x) or the product-specific exchange rate distortion (for example, e_m or e_x) is redundant. In this case, in the absence of other distortions, $NRA_o = 0$, and the $CTE = 0$. However, in the presence of any domestic producer or consumer tax or subsidy (s_f or t_c), the domestic prices faced by both producers *and* consumers will be affected. The extent of the impact depends on the price elasticities of domestic demand and supply for the nontradable (the standard closed-economy tax incidence issue).

Thus, for example, suppose only a production tax is imposed on farmers producing a particular nontradable, so that $s_f < 0$ and $t_c = 0$. In this case:

$$NRA_{DS} = \frac{s_f}{1 + \frac{\varepsilon}{\eta}} \quad (\text{A.5})$$

and

$$CTE = \frac{-s_f}{1 + \frac{\eta}{\varepsilon}}, \quad (\text{A.6})$$

where ε is the price elasticity of supply, and η is the (negative of the) price elasticity of demand.⁶

What if farm production involves primary factors, but also intermediate inputs?

Where intermediate inputs are used in farm production, any taxes or subsidies on the production, consumption, or trade of these inputs would alter farm value added and thereby also affect farmer incentives. Sometimes, a government will have directly offsetting measures in place, such as a domestic subsidy for fertilizer use by farmers, but also a tariff on fertilizer imports. In other situations, there will be farm input subsidies, but an export tax on the final product.⁷ In principle, all these items might be brought together to calculate an effective rate of direct assistance to farm value added (the effective rate of assistance). The nominal rate of direct assistance to farm output, NRA_o , is a component of this, as is the sum of the nominal rates of direct assistance to all farm inputs, call it NRA_i . In principle, all three rates may be positive or negative.

The participants in this project have not been required to estimate effective rates of assistance because to do so requires a knowledge of each product's value added share of output. Such data are not available for most developing countries for every year in the time series nor even for every few years. And, in most developing countries, distortions to farm inputs are small compared with distortions to farm output prices, and these purchased inputs are a small fraction of the value of output. However, where there are significant distortions to input costs, the ad

valorem equivalent is accounted for by summing each input's NRA, multiplying this by the input-output coefficient to obtain the combined NRA_i , and adding this to the farm industry's nominal rate of direct assistance to farm output, NRA_o , to obtain the total NRA in farm production, call it simply NRA .⁸

$$NRA = NRA_o + NRA_i \quad (A.7)$$

What about postfarmgate costs?

If a state trading corporation is charging excessively for its marketing services, thereby lowering the farmgate price of a product (for example, as a way of raising government revenue in place of an explicit tax), the extent of the excess should be treated as if it were a tax.

Some farm products, including some that are not internationally traded, are inputs into a processing industry that may also be subject to government interventions. In this case, the effect of these interventions on the price received by farmers for the primary product also needs to be taken into account. Before we explain how, it may be helpful first to review the possible role the marketing and distribution margins of the value chain may play in the calculation of distortions in primary agricultural activities so as to ensure that nondistortionary price wedges are not inadvertently included in any distortion calculations.

Nondistortionary price wedges

So far, it has been assumed that there are no divergences among farmer, processor-wholesaler, consumer, and border prices other than those arising because of subsidies or taxes on production, consumption, trade, or foreign currency. In practice, this is not so, and these costly value chain activities need to be explicitly recognized and netted out in using comparisons of domestic and border prices to derive estimates of government policy-induced distortions.⁹ Such recognition also offers the opportunity to compare the size of the NRA with wedges associated with, for instance, trade and processing costs (used in trade facilitation and value chain analyses, respectively). It may also expose short-term situations where the profits of importers or exporters are amplified by less-than-complete adjustment by agents in the domestic value chain.

Domestic trading costs

Trading costs may be nontrivial both intra- and internationally, especially in developing countries with poorly developed infrastructure.¹⁰ For example, domestic trading costs are involved in delivering farm products to port or to domestic wholesalers (assuming the latter are at the international border; otherwise, another set of domestic transport costs needs to be added to obtain a relevant price

comparison). Suppose, for instance, that domestic transport costs are equal to the fraction T_f of the price received by the farmer.

Processor-wholesaler costs

Domestic processing costs and wholesale and retail distribution margins may represent a large share of the final retail price. Indeed, Reardon and Timmer (2007) argue that these costs and margins are an increasingly important part of the value chain in developing countries because consumers desire more postfarm processing and services added to their farm products, aided by the contribution of the supermarket revolution to globalization.¹¹ We denote the increases in the consumer price caused by these processing and wholesaling activities, over and above the farmgate price plus domestic trade costs, as m_p and m_w , respectively (or simply m_u above the price of the imported processed product if the processing must be done before the product is internationally tradable), in the absence of market imperfections or government distortions along the value chain.

International trading costs

International trading costs are not an issue in the distortions calculations if the international price used is the cost, insurance, and freight import unit value for an importable or the free on board export unit value for an exportable. But these costs are relevant if there is no trade (because of, say, a prohibitive trade tax on the product) or if the border prices are unrepresentative (because of low trade volumes, for example). In these instances, it is recommended that one select an international indicator price series (such as those of the World Bank or the International Monetary Fund) and account for international trading costs (ocean or air freight, insurance, and so on).¹² We denote T_m as the proportion by which the domestic price of the import-competing product is raised above what it would otherwise be at the country's border, or, equivalently, we denote T_x as the fraction of the free on board price by which the price abroad of the exported product is greater.

Product quality and variety differences

The quality of a product traded internationally is usually considered to differ from the quality of the domestically sold substitute, and consumers typically have a home-country bias.¹³ Whenever appropriate, the domestic price should be deflated (inflated) by the extent to which the good imported is deemed by domestic consumers to be inferior (superior) in quality to the domestic product.¹⁴ We denote q_m as the deflating fraction for the adjustment for product quality and variety differences in the case of importables.

The situation is similar for exported goods. Especially if an international indicator price has to be used in lieu of the free on board export unit value (for example, if

exports are close to zero and unrepresentative), the international price needs to be deflated (inflated) by the extent to which the good is deemed by foreign consumers to be inferior (superior) in quality relative to the indicator good. We denote q_x as the deflating fraction to adjust for product quality and variety differences in the case of exportables.

Net effect of nondistortionary influences

If one takes into consideration all these influences and so long as the product is still traded internationally, the relationships between the price received by domestic farmers and the international price, in the absence of government-imposed price and trade policies, are described by the following for an importable:

$$E \times P = \frac{P_f(1 + T_f)(1 + m_p)(1 - q_m)}{1 + T_m}, \quad (\text{A.8})$$

and for an exportable it is the following:

$$E \times P = \frac{P_f(1 + T_f)(1 + m_p)(1 + T_x)}{1 - q_x}, \quad (\text{A.9})$$

while the urban consumer price is above the producer price to the following extent:

$$P_c = P_f(1 + T_f)(1 + m_p)(1 + m_u), \quad (\text{A.10})$$

where P_f is the farmgate price.

The impact of distortions in food processing on agricultural NRAs

Some farm products that are not internationally traded in their primary form (for example, raw milk and cane sugar) are tradable once they have been lightly processed, and the downstream processing industry may also be subject to government interventions. In this case, the effect of the latter interventions on the price received by farmers for the primary product also needs to be taken into account, and the primary product should be classified as tradable.

Some analysts have assumed that any protection to processors, if it is passed back fully to primary agriculture (as may be the case with a farmer-owned cooperative processing plant, for example), effectively raises the farmer price by the amount of the rise in the processor price, divided by the proportional contribution of the primary product to the value of the processed product. Another equally extreme, but opposite assumption is that there is zero pass-through by the processor back down the value chain to the farmer. This is likely to be the case if

the raw material may be sourced internationally, but seems unlikely if the primary product is nontradable and there is a positive price elasticity of farm supply (since an assisted processor would want to expand). A more neutral assumption is that there is a proportional pass-through by the processor down the value chain to farmers and their transporters or up the value chain to consumers. This would be equivalent to an equal sharing of the benefits along the value chain, which is more likely to be the case, the more equally market power is spread among the players in the chain.

This trio of examples illustrates the importance both of separating primary and processed activities for the purpose of calculating agricultural assistance rates and of being explicit about the extent of pass-through that is occurring in practice and, hence, the consequences for the NRAs in primary agricultural and processing activities.¹⁵

The above examples involving processors may also be generalized to any participants in the value chain. In particular, state trading enterprises and parastatal marketing boards may intervene significantly, especially if they have been granted monopoly status by the government. Such interventions by domestic institutions may explain the low econometrically estimated degree of transmission of price changes at a border to farmgate domestic prices even following a significant reform of more-explicit price and trade policies (see Baffes and Gardner 2003 and the references cited therein). Where reform has also involved the freeing up of previously controlled parts of the marketing chain, the lowered marketing margin may provide a benchmark against which to compare the prereform margin (as in Uganda beginning in the mid-1990s; see chapter 12 in this volume).

The mean and standard deviation of agricultural NRAs

We need to generate a weighted average NRA for covered products in each country because only then will we be able to add the NRA for noncovered products to obtain the NRA for all agriculture. If one wishes to average across countries, each polity is an observation of interest; so, a simple average is meaningful for the purpose of political economy analysis. But, if one wants a sense of the distortions in agriculture in a whole region, a weighted average is needed. The weighted average NRA for covered primary agriculture may be generated by multiplying the value share of each primary industry in production (valued at farmgate equivalent undistorted prices) by the corresponding NRA and then adding across industries.¹⁶ The overall sectoral rate, which we denote as *NRA_{ag}*, may be obtained by also adding the actual or assumed information for the commodities not covered and, where it exists, the aggregate value of non-product-specific assistance to agriculture.

A weighted average may be similarly generated for the tradables part of agriculture—including those industries producing products such as milk and sugar that require only light processing before they are traded—by assuming that the share of the non-product-specific assistance goes to producers of tradables. Call this $NRAag^t$.

In addition to the mean, it is important also to provide a measure of the dispersion or variability of the NRA estimates across the covered products. The cost of government policy distortions in incentives in terms of resource misallocation tends to be greater, the greater the degree of substitution in production (Lloyd 1974). In the case of agriculture involving the use of farmland that is sector specific, but transferable among farm activities, the greater the variation of NRAs across industries within the sector, the higher the welfare cost of these market interventions. A simple indicator of dispersion is the standard deviation of industry NRAs within agriculture.¹⁷

Trade bias in agricultural assistance

A trade bias index also is needed to indicate the extent to which a country's policy regime has an antitrade bias within the agricultural sector. This is important because, as the Lerner (1936) symmetry theorem demonstrates, a tariff that assists import-competing farm industries has an effect on farmer incentives that is the same as the effect of a tax on agricultural exports (see elsewhere above), and, if both measures are in place, this is a double imposition on farm exports. The higher the NRA for import-competing agricultural production ($NRAag_m$) relative to the NRA for exportable farm activities ($NRAag_x$), the more incentive producers in the subsector will have to bid for mobile resources that would otherwise have been employed in export agriculture, all else being equal.

Once each farm industry has been classified as import-competing, as a producer of exportables, or as a producer of a nontradable (the status may sometimes change over the years; see below), it is possible to generate, for each year, the weighted average NRAs for the two different groups of tradable farm industries. These may then be used to generate an agricultural trade bias index, TBI , which is defined as follows:

$$TBI = \left[\frac{1 + NRAag_x}{1 + NRAag_m} - 1 \right], \quad (A.11)$$

where $NRAag_m$ and $NRAag_x$ are the average NRAs, respectively, for the import-competing and exportable parts of the agricultural sector (their weighted average is $NRAag^t$). This index has a value of zero whenever the import-competing and export subsectors are equally assisted, and its lower bound approaches -1 in the most extreme case of an antitrade policy bias.

Indirect agricultural assistance and taxation through nonagricultural distortions

In addition to direct assistance to or taxation of farmers, the Lerner (1936) symmetry theorem also demonstrates that farmer incentives are affected indirectly by government assistance to nonagricultural production in the national economy. The higher the NRA for nonagricultural production (NRA_{nonag}), the more incentive producers in other sectors will have to bid up the value of mobile resources that would otherwise have been employed in agriculture, all else being equal. If NRA_{ag} is below NRA_{nonag} , one might expect there to be fewer resources in agriculture than there would be under free-market conditions in the country, notwithstanding any positive direct assistance to farmers, and, conversely, if NRA_{ag} is greater than NRA_{nonag} . A weighted average may be generated for the tradables part of nonagriculture, too; call it NRA_{nonag}^t .

One of the most important negative effects on farmers arises from protections for industrialists from import competition. Tariffs are part of this, but so too (especially in past decades) are nontariff barriers to imports. Other primary sectors (fishing, forestry, and minerals, including the extraction of energy raw materials) tend, on average, to be subject to fewer direct distortions than either agriculture or manufacturing, but there are important exceptions. One example is a ban on logging; however, if such a ban is instituted for genuine reasons of natural resource conservation, it should be ignored. Another example is a resource rent tax on minerals. Unlike an export tax or quantitative restriction on the exports of such raw materials (which are clearly distortive and would need to be included in the NRA for mining), a resource rent tax, like a land tax, may be fairly benign in terms of resource reallocation and, so, may be ignored (see Garnaut and Clunies Ross 1983).

The largest part of most economies is the services sector. This sector produces mostly nontradables, many of which are provided through the public sector. Distortions in service markets have been extraordinarily difficult to measure, and no systematic estimates across countries are available over time or even for a recent period. The only feasible way to generate time series estimates of NRA_{nonag} in this project has therefore involved the assumption that all services are nontradable, and that they, along with other nonagricultural nontradables, face no distortions. All the other nonagricultural products may be separated into exportables and import-competing products for purposes of estimating correctly their weighted average NRAs, ideally using production valued at border prices as weights (although, in practice, most of our authors have had to use shares of gross domestic product).

Foreign exchange rate misalignment relative to the value of a country's currency—as suggested by the fundamentals—will be ignored (see elsewhere above). This is because a real appreciation of the general foreign exchange rate uniformly lowers

the price of all tradables relative to the price of nontradables; the converse is true for a real devaluation. If a change in the exchange rate has been caused by aid or foreign investment inflows, then the excess of tradables consumption over tradables production leads to a new equilibrium. Certainly, such a new inflow of funds would reduce the incentives among farmers producing tradable products, but this is not a welfare-reducing policy distortion. Thus, it is only the exchange rate distortions caused by a dual or multiple exchange rate system that need to be included in the calculation of the NRAs for the exportable and import-competing parts of the nonagricultural sector and, hence, of NRA_{nonag}^t , and this should be accomplished in the same way discussed above for the inclusion of these distortions in the calculation of NRA_{ag}^t .

Assistance to agricultural production relative to nonagricultural production

Given the calculation of NRA_{ag}^t and NRA_{nonag}^t as above, it is possible to reckon a relative rate of assistance (RRA), defined as follows:

$$RRA = \left[\frac{1 + NRA_{ag}^t}{1 + NRA_{nonag}^t} - 1 \right]. \quad (A.12)$$

Since an NRA cannot be less than -1 if producers are to earn anything, then neither can the RRA. The RRA is a useful indicator in undertaking international comparisons over time of the extent to which a country's policy regime has an anti- or proagricultural bias.

The Ways the Theory Is Put into Practice in This Study

Making the theory described above operational in the real world, where data are often scarce, especially over a long time period, is as much an art as a science.¹⁸ Thankfully, for many countries, we have not had to start from scratch. NRAs are available from as early as 1955 in some cases and at least from the mid-1960s to the early or mid-1980s for the 18 countries included in Krueger, Schiff, and Valdés (1988, 1991a) and Anderson and Hayami (1986). Much has been done to provide detailed estimates since 1986 of direct distortions in farmer incentives (though not in food processing) in the high-income countries that are now members of the Organisation for Economic Co-operation and Development (OECD) and, since the early to mid-1990s, in selected European transition economies and Brazil, China, and South Africa (OECD 2007a, 2007b). At least for direct distortions, the Krueger, Schiff, and Valdés measures (1988, 1991a) have been updated to the mid-1990s for some Latin American countries (Valdés 1996) and have also

been provided for some countries in Eastern Europe (Valdés 2000), and a new set of estimates of simplified producer support estimates for a few key farm products in China, India, Indonesia, and Vietnam since 1985 is now available from the International Food Policy Research Institute (Orden et al. 2007). The methodology described above is, in some sense, a variation on each of these studies, and the basic price data, at least, as well as the narratives attached to the estimates in these studies, are invaluable springboards for our study.¹⁹

Time period coverage of the study

For Europe's transition economies, it is difficult to find meaningful data on the situation prior to 1992. For the same reason, estimates are not particularly useful before the 1980s for China and Vietnam. For all other countries, the target start date has been 1955, especially if this date includes years before and after a year of independence so that one might examine the effects of independence, although, for numerous developing countries, the data simply are not available. The target end date has been 2004, but, where available, 2005 data have also been included. In most cases, the most recent few years offer the highest quality data.

Farm product coverage of the study

The agricultural commodity coverage includes all the major food items (rice, wheat, maize or other grains, soybeans or other temperate oilseeds, palm oil or other tropical oils, sugar, beef, sheep and goat meat, pork, chickens and eggs, and milk), plus other key country-specific farm products (for example, other staples, tea, coffee or other tree crop products, tobacco, cotton, wine, and wool). Globally, as of 2001, one-third of the value added in all agriculture and food industries has been highly processed food, beverages, and tobacco (GTAP Database; Dimaranan 2006). We have also addressed these products briefly, in the same cursory way we have addressed nonagricultural products. Fruits and vegetables are another one-sixth; so, the rest constitute the other half. Of that other half, meats are one-third; grains and oilseeds are almost another one-third; dairy products are one-sixth; and sugar, cotton, and other crops account for slightly more than one-fifth. If the high-income countries are excluded, these shares change quite sharply. Then, highly processed food, beverages, and tobacco are only half as important; fruits and vegetables are somewhat more important, and, if these two groups (which together account for 41 percent of the total) are excluded, the residual is equally divided between three groups: meats, grains and oilseeds, and other crops and dairy products. By focusing on all major grain, oilseed, and livestock products, plus any key horticultural and other crop products, the coverage of our project

reaches the target of 70 percent of the value added of most countries in agriculture and lightly processed food. Priority has been assigned to the most distorted industries because the residual will then have not only a low weight, but also a low degree of distortion.

If highly processed food, beverages, and tobacco are excluded, then fruits and vegetables account for almost one-quarter of household food expenditure in developing countries. If fruits and vegetables are also excluded, three groups each then account for almost 30 percent of expenditure: pig and poultry products, red meat and dairy products, and grains and oilseed products. All other crops account for the remaining one-eighth. So, from the consumer tax viewpoint, the desired product coverage is the same as the coverage outlined above from a production viewpoint.

Each product is explicitly identified as import-competing, exporting, or nontradable. For many products, this categorization changes over time. In some cases, products move monotonically through these three categories, and, in others, they fluctuate in and out of nontradability. Hence, an indication of a product's net trade status is given for each year rather than for only one categorization for the whole time series. In large-area countries with high internal and coastal shipping costs, some regions may be exporting abroad, even while other regions are net importers from other countries. In such cases, it is necessary to estimate separate NRAs for each region and then generate a national weighted average.

Farm input coverage

The range of input subsidies considered in any particular country study in our project has depended on the degree of distortions in that country's input markets. In addition to fertilizer, the large inputs and distortions are likely to involve electrical or diesel power, pesticides, and credit (including, occasionally, large-scale debt forgiveness, as in Brazil and Russia, although how this is spread out beyond the year of forgiveness is an issue).²⁰ There are also distortions revolving around water, but the task of measuring water subsidies is especially controversial and complex; so, these distortions have not been included in the NRA calculations. (The OECD has also ignored them in its producer support estimates.) Similarly, distortions in land and labor markets have been excluded, apart from qualitative discussions in the analytical narratives in some of the country case studies.

Trade costs

For the calculation of distortions in international trading costs, T_m and T_x , the free on board–cost, insurance, and freight gap in key bilateral trade in products during

years when the products have been traded in significant quantities is used. Both international and domestic trading costs are a function of the quality of hard infrastructure (roads, railways, ports) and soft infrastructure (business regulations and customs clearance procedures at state and national borders), each of which may be affected by government actions. However, because it is difficult to allocate these costs between items that are avoidable and those that are unavoidable, measuring the aggregate size of the distortions involved in a comparable way for a range of countries is beyond the scope of this study.²¹

Classifying farm products as import-competing, exportable, or nontradable

The criteria used in classifying farm industries as import-competing (*M*), exporting (*X*), or nontrading (*H*) are not straightforward. Apart from the complications raised above about whether a product is not traded simply because of trade taxes or nontariff barriers, there will be cases where trade is minimal, or the trade status has been reversed because of policy distortions, or the industry is characterized by significant imports *and* exports. A judgment has to be made for each sector each year as to whether it should be classified as *M*, *X*, or *H*. In the case of the two tradable classifications (that is, leaving out nontradables), this judgment will determine which exchange rate distortion to use. If trade is minimal for reasons of trade cost rather than reasons of trade policy, then a product is classified as nontradable if the share of production exported *and* the share of consumption imported are each less than 2.5 percent, except in situations (for example, rice in China) in which the product is clearly an exportable year after year even though the self-sufficiency rate is rarely above 101 percent. Otherwise, if the share of production exported is substantially above (below) the share of consumption imported, the product is classified as exportable (importable).

In cases in which the trade status has been reversed because of a policy distortion (for instance, an export subsidy, in combination with a prohibitive import tariff, is large enough to encourage sufficient production to generate an export surplus), the product should be given the classification of the trade status that would prevail without the intervention (that is, import-competing). The same applies if tariff preferences reverse a country's trade status with respect to a product. The exports of many countries enjoy preferential access into the protected markets of other countries. In some cases, these arrangements are based on bilateral or plurilateral free trade agreements or customs unions. In other cases, the preferences are unilaterally offered by higher-income countries to developing countries through schemes such as the generalized system of preferences, the Cotonou Agreement (between the Africa, Caribbean, and Pacific group and the

European Union), and the European Union's Everything But Arms Initiative. In the few extreme cases where these preferences are such that they (in combination with a prohibitive import tariff) cause the developing country to become an exporter of a product that would otherwise be import-competing (such as sugar in the Philippines), the product should nonetheless be classified as import-competing because the developing country's import-restrictive policy is allowing the domestic price of the product to equal the price reached in exporting to the preference-providing country.

If there are significant exports *and* imports in a given year, closer scrutiny is required. If, for example, there are high credit or storage costs domestically, a product may be exported immediately following harvest, but imported later in the year to satisfy consumers out of season. The product would be considered an exportable for purposes of calculating the NRA because, even if there are policies restricting out-of-season imports (which would affect the CTE calculation), they would not represent an encouragement for the production earlier in the year in the presence of high credit or storage costs.

If trade or exchange rate distortions are sufficiently large to choke off international trade in a product, then they contribute to the NRA and CTE only to the extent required to drive that trade to zero: any trade taxes that exceed this requirement have an element of redundancy. If there are trade policy distortions, but no trade passes over them (that is, they are prohibitive), there may still be policy effects that need to be measured, but they will differ from those involved in the other cases above. An example would be a prohibitive tariff that is high enough to take the price of imported goods above the autarchy price and thus results in no imports. The NRA would therefore be less than the prohibitive tariff rate. Another common example is an import tariff in a context in which the world price is sufficiently high so that the country is freely exporting the product at issue. In this case, the domestic price would be determined by the world price, less the export trade costs; the import tariff would be irrelevant, and there would be no distortion despite the presence of the import tariff.

Similar conditions apply to exportable goods in a context in which a prohibitive export tax creates a distortion at a level lower than the tax rate. Then, the distortion wedge would be equal to the difference between the autarchy price and the world price, less the export trade costs; if the country were freely importing the good, the export tax would be irrelevant, and there would be no distortion despite the presence of the export tax. The choice of the international price to be compared with domestic prices is therefore not based only on the actual trading status of a country (Byerlee and Morris 1993). Moreover, different prices may be needed for different regions of a large country that simultaneously exports and imports because internal trading costs (including coastal shipping) are so high relative to international trading

costs (Koester 1986). In this case, the value of production is split according to the regional production shares in the country. If the only intervention in this sector is a tariff on imports, the tariff rate is the NRA estimate for the import-competing part, and the NRA is zero for the other part of the sector; these different NRAs are then included in the weighted average calculations of the NRAs for the import-competing and exportable subsectors of agriculture.

The transmission of assistance and taxation along the agricultural value chain

A crucial aspect of the NRA calculation for agricultural products is the way any policy measure beyond the farmgate is transmitted back to farmers and forward to consumers. Only a few parameters and exogenous variables are needed to obtain meaningful estimates of an individual agricultural product's NRA and CTE. Specifically, to take account of the pass-through of distortions along the value chain, parameters have been identified as follows (although the default is an equiproportionate pass-through):

- θ_f , the extent to which any distortion to a primary farm product at the wholesale level is passed back to farmers
- θ , the extent to which any distortion to the downstream processed product is passed back to wholesalers of a primary farm product that is nontradable

The CTEs of farm products

Many farm products are processed and are used as ingredients in the additional processing of food products before the food products are purchased by final consumers. (For example, wheat is ground to flour and then mixed with other ingredients before baking, slicing, and packaging for sale as bread.) Other farm products are used as inputs in various farm activities, often after the farm products have undergone some processing. (Thus, soybeans are crushed, and the meal is mixed with maize or other feed grains for use as animal feed, while the oil is sold for cooking.) Because of these many and varied value chain paths and because, in practice, it is difficult anyway to determine the extent to which a change in the primary farm product would be passed along any of these value chains, the OECD expresses its consumer support estimate simply at the level at which a product is first traded (for example, as wheat, or soybeans, or beef). This practice has been adopted here, too, to generate a consistent set of CTEs across countries to use in the analysis in chapter 1 (even though our authors of individual country studies may report CTEs that they have estimated in a more-sophisticated way farther along the value chain). In the absence of any domestic production or consumption taxes or subsidies directly affecting a product, the CTE at the point at which the product

is first traded will be the same as the NRA_o . (Also recall that the NRA_o in this case also equals the NRA if NRA_i is zero.)

Key required information

A template spreadsheet has been designed to aid in the management of individual country information and ensure a consistent comparison across regions and periods. The precise ways in which parameters and exogenous variables have entered each country spreadsheet to generate the NRAs and CTEs endogenously are detailed in Anderson et al. (2008a, 2008b). Most are straightforward; the main exception is the treatment of exchange rate distortions that is described below.

The key exogenous variables needed are the agricultural quantities produced and consumed (or imported and exported if the proxy for consumption is production, plus net imports); the wholesale and border prices of primary and lightly processed agricultural goods (along with, where relevant, a quality adjustment to match border prices); agricultural domestic input and output subsidies and taxes (the default is zero); if there are distorted farm input markets, the share of the input in the value of farm output at border prices (and, if there are only farmgate prices rather than wholesale prices for a primary good, the proportion of the farmgate value in the value at the wholesale level measured at the border price); the final domestic food consumer subsidies or taxes (the default is zero); and the official exchange rate (and, where prevalent, the parallel exchange rate and the share of currency going through the secondary or illegal market, plus the product-specific exchange rate if a multiple exchange rate system is in place).

Exchange rate distortions

The treatment of exchange rate distortions is worth spelling out since it differs from the method used by Krueger, Schiff, and Valdés (1988, 1991a).

If there are no exchange rate distortions, the official exchange rate is used. However, in the presence of a parallel market rate (which might be the black market rate if no legal secondary market exists), this is reported, along with an estimate of the proportion of foreign currency that is actually sold by exporters at the parallel market rate. This proportion is the formal retention rate if a formal dual exchange regime is in place; otherwise, it is based on a guesstimate of the proportion traded on the black market. (The black market premiums are provided in Cowitt, various years; Cowitt, Edwards, and Boyce, various years; and the Global Development Network Growth Database). The spreadsheet is then used to compute an estimate for the equilibrium exchange rate for the economy; this is the rate at which international prices are converted into local currency for the computation of each NRA.

Relevant exchange rates for importers and exporters are also then computed endogenously. If they are distorted away from the official exchange rate, the relevant exchange rate for importers and exporters are, respectively, the discounted parallel market rate and the weighted average of the official exchange rate and the discounted parallel rate according to the proportion of the exporter's currency that is sold on the parallel market. However, if a multiple exchange rate system is in place and this system provides for a specific rate for a product that differs from the general rates automatically calculated as above, then the automatically computed relevant exchange rate is replaced by this industry-specific rate.

Guesstimates of NRAs for agricultural products not covered

In the calculation of the weighted average rates of assistance for a subsector or sector, NRAs must be guesstimated for the agricultural products that are not covered (30 percent or so) and for which price comparisons are not calculated. The OECD, in its work on producer support estimates, assumes that the part not measured enjoys the same market price support as the average of the measured part. Another default is the assumption that the rates are zero. Orden et al. (2007) show that these two alternatives produce significantly different results for India. It is therefore preferable to make informed judgments about the import-competing, exportable, and nontradable parts of the residual group of farm products. An average applied import tariff is often the best guess for only the import-competing products among this set if there is no evidence of the existence of explicit production, consumption, or export taxes or subsidies. Even though this approach will miss the nontariff trade barriers affecting these residual products, the bias will be small if the weight is small.

Non-product-specific assistance to agriculture

If, in addition to the product-specific subsidies or taxes, there are non-product-specific forms of agricultural subsidies or taxes that one is unable to allocate among importables, exportables, and nontradables, these are included in the *NRAag* using the same method (as a percentage of the total value of production) used for these types of interventions in the OECD's calculations of its total support estimate (see OECD 2007a, 2007b).

No attempt is made to estimate the discouraging effects of underinvestment in rural infrastructure or underdevelopment among pertinent institutions. The structure of the related expenditure within the rural sector is also important. This may well be a nontrivial part of the distortions in agricultural incentives, but, unfortunately, it is not captured in the measures of distortions outlined above.

In some higher-income countries, governments also assist farm households through payments that are purported to be decoupled from production incentives. An example is the single farm payment in the European Union. We do not count such payments as part of *NRA_{ag}* because the latter refers specifically to measures that alter producer incentives. However, we do include the ad valorem equivalent of these payments in discussing assistance to farmers as a social group so as to be able to compare the order of magnitude of this equivalent with the support provided through measures that alter production incentives.

Assistance to nonagricultural sectors

If nonagricultural sectors are assisted only through import tariffs on manufactures or export taxes on minerals, it is a relatively easy task to estimate a weighted average *NRA_{nonag}* once the shares of import-competing, exporting, and nontradable production have been determined. In practice, however, non-tariff trade measures must also be considered among the measures affecting tradables (Dee and Ferrantino 2005; OECD 2005), and most economies have myriad regulations affecting the many service industries. These regulations may be complex (see Findlay and Warren 2000). Because most of the outputs of service industries (including the public sector) are nontradable, the default in this study is to assume that the average rate of government assistance, along with that of nontradable nonagricultural goods, is zero. Then, the task of estimating the *NRA_{nonag}* is reduced to obtaining only the NRAs for the producers of import-competing products and of export-oriented nonagricultural goods, plus the shares of these products and goods in the undistorted value of the production of nonagricultural tradables, so as to derive the weighted average *NRA_{nonag}^f* to be entered into the RRA calculations.

The use of percentages in the chapters

To simplify the presentation in the chapters, the *NRA_o*, *NRA_i*, *NRA*, *CTE*, and *RRA* are expressed there as percentages rather than proportions.

Dollar values of farmer assistance and consumer taxation

For chapter 1, we have taken the country authors' estimate of *NRA* and multiplied it by the gross value of production at undistorted prices to obtain an estimate in current US dollars of the direct gross subsidy equivalent of assistance to farmers (*GSE*). This can then simply be added up across products for a country and across countries for any or all products to get regional aggregate transfer estimates for the studied countries. To get an aggregate estimate for the rest of the region, we assume the weighted average *NRA* for nonstudied countries is the same as the weighted

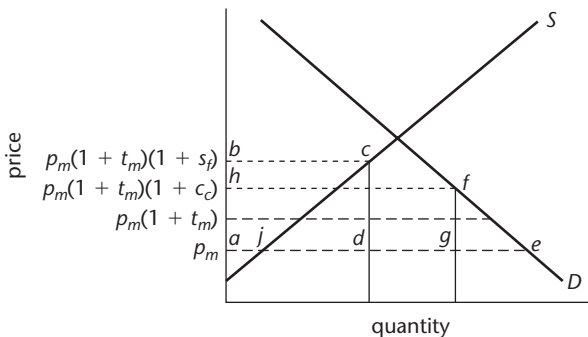
average *NRA* for the studied countries, and that the nonstudied countries' share of the region's gross value of farm production at undistorted prices each year is the same as its share of the region's agricultural GDP measured at distorted prices. All current US dollar values are then converted to constant 2000 dollars using the GDP deflator for the United States.

To obtain comparable dollar value estimates of the consumer transfer, we have taken the *CTE* estimate at the point at which a product is first traded and multiplied it by the gross value of consumption at undistorted prices (proxied by production at undistorted prices plus net imports) to obtain an estimate in current US dollars of the tax equivalent to consumers of primary farm products (*TEC*). This too can then be added up across products for a country and across countries for any or all products to get regional aggregate transfer estimates for the studied countries and converted to US dollars again using the GDP deflator. We do not attempt to get an aggregate estimate for noncovered products in the studied countries nor for the region's nonstudied countries.

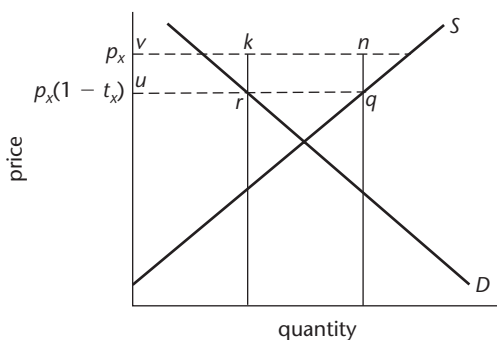
The *GSE* and *TEC* dollar values can be illustrated in a supply-demand diagram for a distorted domestic market for a farm product (see figure A.2). In the case of an import-competing product subjected to an import tariff t_m plus a production subsidy s_f and a consumption tax c_c , the *GSE* is the rectangle $abcd$ and the *TEC* is the rectangle $ahfg$. The *GSE* estimate is an overstatement to the extent of triangle cdj and the *TEC* estimate is an understatement to the extent of triangle efg , where those triangles are smaller the more price-inelastic are the supply and demand curves *S* and *D*, respectively. In the case of an exportable product subjected to an export tax t_x , the *GSE* is the negative of the rectangle $kruv$ and the *TEC* is the negative of the rectangle $nquv$.

Figure A.2. Distorted Domestic Markets for Farm Products

(a) An import-competing product subjected to an import tariff t_m plus a production subsidy s_f and a consumption tax c_c



(b) An exportable product subjected to an export tax t_x



Source: Authors' derivation.

Notes

1. The NRA therefore differs from the producer support estimate calculated by the Organisation for Economic Co-operation and Development (OECD) in that the producer support estimate is expressed as a fraction of the distorted value (see the OECD PSE-CSE Database). It is thus $t_m/(1 + t_m)$, and, so, for a positive t_m , it is smaller than the NRA and is necessarily less than 100 percent.

2. Equilibrium here refers to the situation that would prevail without the distortion in the domestic market for foreign currency. In figure A.1 and in the discussion that follows, the equilibrium exchange rate, E , exactly balances the supply and demand for foreign currency. Taken literally, this implies a zero balance on the current account. The approach here may readily be generalized to accommodate exogenous capital flows and transfers, which would shift the location of Q_E . With constant-elasticity supply and demand curves, all of the results would carry through, and any exogenous change in the capital flows or transfers would imply a shift in the D_{fx} or S_{fx} curves.

3. From the viewpoint of using the NRA_o and CTE estimates later as parameters in a computable general equilibrium model, it does not matter which assumptions are made here about these elasticities because the model's results for real variables will not be affected. What matters for real impacts is the magnitude of the total distortion, not its allocation between an export tax and an import tax; this is the traditional incidence result from tax theory that also applies to trade taxes (Lerner 1936). For an excellent general equilibrium treatment using an early version of the World Bank's 1–2–3 model, see de Melo and Robinson (1989). There, the distinction is drawn between traded and nontraded goods (using the Armington [1969] assumption of differentiation between products sold on the domestic market and products sold on the international market), in contrast to the distinction between tradable and nontradable products made below in the text.

4. Note that this same type of adjustment might be made if the government forces exporters to surrender all foreign currency earnings to the domestic commercial banking system and importers to buy all foreign currency needs from that banking system and if that system is allowed by regulation to charge excessive fees. This apparently occurs in, for example, Brazil, where the spread is reputedly 12 percent. If actual costs in a nondistorted competitive system are only 2 percent (as they are in the less-distorted Chilean economy), the difference of 10 points might be treated as the equivalent of a 5 percent export tax and a 5 percent import tax applying to all tradables (although, as with nontariff barriers, there would be no government tariff revenue, but rather rent, which, in this case, would accrue to commercial banks instead of to the central bank). This is an illustration of the point made by Rajan and Zingales (2004) about the power of financial market reform to expand opportunities.

5. The results of a multicountry research project that has had macropolicy as its focus are reported in Little et al. (1993).

6. As in the case of the two-tier exchange rate, the elasticities are used merely to identify the incidence of these measures; as long as both the NRA_o and the CTE are included in any economic model used to assess the impact of the production tax, the real impacts will depend only on the magnitude of the total distortion, s_f , not on the estimated NRA and CTE .

7. On this general phenomenon of offsetting distortions for outputs and inputs (and even direct payments or taxes), see Rausser (1982).

8. Bear in mind that a fertilizer plant or livestock feed mix plant might be enjoying import tariff protection that raises the domestic price of fertilizer or feed mix to farmers by more than any consumption subsidy (as was the situation with respect to fertilizer in Korea; see Anderson 1983). In such a case, the net contribution of this set of input distortions to the total NRA for agriculture would be negative.

9. This is not to say that there is no interest in comparisons across countries or over time in, for example, the farmgate price as a proportion of the free on board export price, which summarizes the extent to which the producer price is depressed by the sum of internal transport, processing, and marketing costs, plus items such as explicit or implicit production or export taxes. Prominent users of this proportion—which may be less than half in low-income countries even if there is little or no processing—include Bates (1981) and Binswanger and Scandizzo (1983). Users need to be aware, though, that this ratio understates the extent of farmer assistance (that is, it understates the rate of protection or overstates the rate of disprotection to farmers), possibly by a large margin.

10. On the basic economics of trading costs as affected by, for example, infrastructure within the country, at the border (ports, airports), and, in the case of landlocked countries, in transit countries, as well as international freight costs and so on, and their impact on both the aggregate volume and product structure of international trade, see Limão and Venables (2001), Venables and Limão (2002), and Venables (2004). See also the survey by Anderson and van Wincoop (2004), where it is reported that the tax equivalent of trading costs are estimated at more than 170 percent in high-income countries and higher in developing and transition economies, especially those that are small, poor, and remote. By lowering these trading costs (for example, by streamlining customs clearance procedures), trade facilitation may be the result not only of technological changes, but also of government policy choices such as restrictions on the ships that may be used in bilateral trade. For example, Fink, Mattoo, and Neagu (2002) estimate that the policy contribution to the cost of shipping goods from developing countries to the United States is greater than the border import barriers. More generally, on imperfect competition in services markets, including cartelized international shipping, see Francois and Wooten (2001, 2006).

11. The costs of processing and of wholesale and retail distribution, as well as domestic trading costs, change over time not only because of technological advances, but also following policy changes. For example, government investment in rural infrastructure may lower trading costs. Reardon and Timmer (2007) argue that the global supermarket revolution is, in part, driven by the opening of domestic markets following the relaxation of government restrictions on foreign direct investment since the 1980s. These types of government policies are not included in our project's measurement of distortions.

12. Trading costs may be unrelated to the product price (that is, specific rather than ad valorem), in which case the formulas should be adjusted accordingly (for example, if T_f is in dollars per ton). If this were the case with international trading costs, the domestic price of importables (exportables) would change less (more) than proportionately with P . The ad valorem assumption is preferable to the specific one in situations where international price and exchange rate changes are less than those that are fully passed through the domestic value chain to the farmer and consumer because of incomplete market integration caused, for example, by poor infrastructure or weak institutions. Ideally, in such cases, one would estimate econometrically the extent to which the price transmission elasticity is below unity and use this to calculate the margin each year.

Trading costs include the storage costs that would be incurred to hold domestic products until the time in the season when international trade takes place. Any subsidies or taxes on these or any other

trading costs should be included in the distortion calculus. On the importance of these domestic trading costs in low-income countries, see Khandker, Balkht, and Koolwal (2006) on Bangladesh; Moser, Barrett, and Minten (2005) on Madagascar; and Diop, Brenton, and Asarkaya (2005) on Rwanda.

13. On the how and the why of the variation by country of origin in the quality and variety of traded goods, see Hummels and Klenow (2005).

14. We assume that the quality difference arises because one good provides more effective units of service than another, so that the relative price is a constant proportion of the value of the first good. If products are simply differentiated, without such a quality dimension (as in Armington 1969), there will be no fixed relationship between the two prices.

15. In using the NRA and the CTE estimates later as parameters in a computable general equilibrium model, as in the case of the incidence of the exchange rate distortion discussed elsewhere above, the assumptions made here about the extent of pass-through along the value chain may not greatly affect the model's results for real variables such as prices, output, and value added.

16. Corden (1971) proposed that free trade volumes be used as weights, but, because these are not observable (and an economy-wide model is needed to estimate them), the common practice is to compromise by using actual distorted volumes, but undistorted unit values or, equivalently, distorted values, divided by $(1 + NRA)$. If estimates of own- and cross-price elasticities of demand and supply are available, a partial equilibrium estimate of the quantity at undistorted values might then be generated, but, if these estimated elasticities are unreliable, this may introduce additional error over and above the error one seeks to correct.

17. The mean and standard deviations might be captured by a single measure, namely, the trade restrictiveness index developed by Anderson and Neary (2005). Calculating this index even in its simplest partial equilibrium mode requires that one know the own- and cross-price elasticities of demand and supply (or, at least, the elasticity of import demand, but this shortcut is only usable if the NRA and CTE are identical).

18. In addition to the methodologies of Krueger, Schiff, and Valdés (1988, 1991a) and the OECD (2007a, 2007b) for estimating agricultural distortion and producer support indicators, see the recent review by Josling and Valdés (2004) of methodologies in earlier studies.

19. Other trade policy studies have also been of great help, particularly studies on trade and exchange rate distortions. These include various multicountry studies such as the one summarized in Bhagwati (1978) and Krueger (1978) and more-recent ones summarized in Bevan, Collier, and Gunning (1989); Michaely, Papageorgiou, and Choksi (1991); Bates and Krueger (1993); and Rodrik (2003).

20. For an analysis of input subsidies in Indian agriculture, see Gulati and Narayanan (2003).

21. That these costs vary hugely across countries and often dwarf trade taxes has now been clearly established. See, for example, World Bank (2006a, 2006b), the Doing Business Database, and the governance and anticorruption indicators in the WGI Database. Also now available is a database on information and communications cost indicators for 144 countries; see the ICT at a Glance Database. In some settings, price bands induced by trading costs arising because of missing or imperfect markets in rural areas lead poor farmers to forgo cash crops to ensure sufficient food production for survival (de Janvry, Fafchamps, and Sadoulet 1991; Fafchamps 1992). This contributes to the low supply responsiveness among poor producers to international price changes for the cash crops.

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ANNUAL ESTIMATES OF DISTORTIONS TO AGRICULTURAL INCENTIVES IN AFRICA

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This appendix summarizes the key distortion indicators defined in appendix A and in Anderson et al. (2008) for the 21 focus countries of this study on Africa. It also provides some summary statistics for the region's estimates, including the focus countries' share of global volume of production and consumption of covered agricultural products and of the regional and global value shares of imports and exports of those products. In a longer, working paper version of this appendix (Valenzuela et al. 2007), four tables are provided for each country: the nominal rate of assistance (NRA) to individual farm products covered in the study and their weighted average, using as weights production valued at undistorted prices; the relative rate of assistance (RRA) to producers of agricultural (relative to non-agricultural) tradables, again using as weights production valued at undistorted prices, and the component parts of the RRA calculation; the weights themselves for individual covered farm products and for the residual noncovered group of products, shown as percentages, so they sum to 100 percent; and the trade status of each covered product each year.

The NRA in the case of a product whose output price distorted by government policies is the percentage by which the domestic producer price exceeds the price that would prevail under free markets, that is, the border price appropriately adjusted to account for differences in product quality, transport costs, processing costs, and the like. A negative value indicates the domestic price is below that

comparable border price. If producers of that product also are affected by distortions to product-specific input prices, their ad valorem equivalent is accounted for by subtracting the ad valorem input price distortion times its input-output coefficient from the farm industry's output NRA to obtain the total nominal rate of assistance to production of that farm product.

The RRA is defined as $100 * [(100 + NRA_{ag}^f) / (100 + NRA_{nonag}^f) - 1]$, where NRA_{ag}^f and NRA_{nonag}^f are the percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

The sources of the tables in this appendix are the working paper versions of the chapters in this volume, each of which is downloadable in the working paper section of the project's Web site, www.worldbank.org/agdistortions. Also available at that Web site are the fuller version of this appendix (Valenzuela et al. 2007) and the complete global distortions database (Anderson and Valenzuela 2008). The references are provided at the end of the tables.

Table B.1. Annual NRA Estimates, Benin, 1970–2005
(percent)

Year	Cassava	Cotton	Millet	Sorghum	Yam	All covered products
1970	0	-31	0	0	0	-1
1971	0	-43	0	0	0	-2
1972	0	-43	0	0	0	-3
1973	0	-69	0	0	0	-7
1974	0	-42	0	0	0	-2
1975	0	-51	0	0	0	-2
1976	0	-63	0	0	0	-2
1977	0	-41	0	0	0	0
1978	0	-50	0	0	0	-1
1979	0	-48	0	0	0	-1
1980	0	-52	0	0	0	-1
1981	0	-33	0	0	0	0
1982	0	-46	0	0	0	-1
1983	0	-55	0	0	0	-2
1984	0	-46	0	0	0	-3
1985	0	14	0	0	0	1
1986	0	5	0	0	0	0
1987	0	-19	0	0	0	-1
1988	0	-10	0	0	0	-1
1989	0	-42	0	0	0	-3
1990	0	-30	0	0	0	-2
1991	0	-15	0	0	0	-1
1992	0	17	0	0	0	1
1993	0	-19	0	0	0	-2
1994	0	-61	0	0	0	-14
1995	0	-37	0	0	0	-8
1996	0	-28	0	0	0	-5
1997	0	-32	0	0	0	-5
1998	0	3	0	0	0	0
1999	0	-9	0	0	0	-1
2000	0	-23	0	0	0	-3
2001	0	6	0	0	0	1
2002	0	-16	0	0	0	-1
2003	0	-17	0	0	0	-1
2004	0	15	0	0	0	1
2005	0	10	0	0	0	0

Source: Baffes 2007.

Table B.2. Annual NRA Estimates, Burkina Faso, 1970–2005
(percent)

Year	Cassava	Cotton	Millet	Sorghum	Yam	All covered products
1970	0	-28	0	0	0	-1
1971	0	-44	0	0	0	-2
1972	0	-45	0	0	0	-2
1973	0	-69	0	0	0	-5
1974	0	-41	0	0	0	-2
1975	0	-50	0	0	0	-3
1976	0	-68	0	0	0	-8
1977	0	-37	0	0	0	-1
1978	0	-47	0	0	0	-2
1979	0	-45	0	0	0	-3
1980	0	-54	0	0	0	-3
1981	0	-45	0	0	0	-2
1982	0	-60	0	0	0	-4
1983	0	-68	0	0	0	-6
1984	0	-51	0	0	0	-4
1985	0	6	0	0	0	0
1986	0	0	0	0	0	0
1987	0	-20	0	0	0	-2
1988	0	-14	0	0	0	-1
1989	0	-41	0	0	0	-5
1990	0	-30	0	0	0	-4
1991	0	-13	0	0	0	-1
1992	0	8	0	0	0	0
1993	0	-14	0	0	0	-1
1994	0	-68	0	0	0	-10
1995	0	-43	0	0	0	-5
1996	0	-34	0	0	0	-4
1997	0	-36	0	0	0	-7
1998	0	-12	0	0	0	-1
1999	0	-6	0	0	0	-1
2000	0	-27	0	0	0	-5
2001	0	15	0	0	0	1
2002	0	-14	0	0	0	-1
2003	0	-20	0	0	0	-3
2004	0	38	0	0	0	6
2005	0	13	0	0	0	2

Source: Baffes 2007.

Table B.3. Annual NRA Estimates, Cameroon, 1961–2004*(percent)*

Year	Banana	Cassava	Cocoa	Coffee	Cotton	Maize	Millet	Other roots & tubers	Plantain	Sorghum	All covered products
1961	-3	0	-29	-35	—	0.0	0	0	0	0	-4
1962	-1	0	-28	-38	—	0	0	0	0	0	-4
1963	-4	0	-37	-26	—	0	0	0	0	0	-5
1964	-2	0	-21	-26	—	0	0	0	0	0	-4
1965	-4	0	-31	-34	—	0	0	0	0	0	-5
1966	-4	0	-43	-30	—	0	0	0	0	0	-6
1967	-3	0	-50	-29	—	0	0	0	0	0	-8
1968	-2	0	-55	-30	—	0	0	0	0	0	-9
1969	-8	0	-61	-35	—	0	0	0	0	0	-13
1970	0	0	-46	-43	-34	0	0	0	0	0	-12
1971	0	0	-29	-44	-46	0	0	0	0	0	-9
1972	0	0	-35	-43	-37	0	0	0	0	0	-9
1973	0	0	-53	-39	-64	0	0	0	0	0	-13
1974	0	0	-61	-48	-39	0	0	0	0	0	-16
1975	1	0	-42	-37	-46	0	0	0	0	0	-8
1976	0	0	-64	-63	-57	0	0	0	0	0	-22
1977	0	0	-78	-74	-30	0	0	0	0	0	-40
1978	-8	0	-66	-56	-43	0	0	0	0	0	-30
1979	-1	0	-52	-51	-33	0	0	0	0	0	-25
1980	1	0	-31	-41	-28	0	0	0	0	0	-16
1981	0	0	-31	-30	-17	0	0	0	0	0	-12
1982	-2	0	-30	-44	-31	0	0	0	0	0	-17

(Table continues on the following page.)

Table B.3. Annual NRA Estimates, Cameroon, 1961–2004 (continued)

Year	Banana	Cassava	Cocoa	Coffee	Cotton	Maize	Millet	Other roots & tubers	Plantain	Sorghum	All covered products
1983	-4	0	-44	-49	-45	0	0	0	0	0	-19
1984	-1	0	-53	-55	-25	0	0	0	0	0	-33
1985	1	0	-37	-44	35	0	0	0	0	0	-19
1986	1	0	-16	-39	45	0	0	0	0	0	-14
1987	-2	0	-1	1	20	0	0	0	0	0	0
1988	-1	0	17	3	32	0	0	0	0	0	4
1989	-3	0	27	4	-41	0	0	0	0	0	3
1990	-2	0	-15	-10	-28	0	0	0	0	0	-3
1991	-1	0	-23	-4	-11	0	0	0	0	0	-3
1992	-1	0	-19	17	14	0	0	0	0	0	-1
1993	-1	0	-44	-11	46	0	0	0	0	0	-4
1994	20	0	-63	-70	-44	0	0	0	0	0	-12
1995	9	0	-18	-27	-25	0	0	0	0	0	-4
1996	6	0	-32	6	-22	0	0	0	0	0	-2
1997	7	0	-46	-4	-21	0	0	0	0	0	-6
1998	2	0	-51	-8	4	0	0	0	0	0	-6
1999	-1	0	-24	-10	-6	0	0	0	0	0	-4
2000	5	0	-20	-5	0	0	0	0	0	0	-1
2001	3	0	-15	-8	8	0	0	0	0	0	-1
2002	1	0	-20	-9	-11	0	0	0	0	0	-3
2003	-1	0	-9	0	-21	0	0	0	0	0	-2
2004	-1	0	2	12	30	0	0	0	0	0	1

Source: Bamou and Masters 2007.

Note: — = no data are available.

Table B.4. Annual NRA Estimates, Chad, 1970–2005
(percent)

Year	Cassava	Cotton	Millet	Sorghum	Yam	All covered products
1970	0	-39	0	0	0	-5
1971	0	-49	0	0	0	-10
1972	0	-50	0	0	0	-11
1973	0	-73	0	0	0	-27
1974	0	-34	0	0	0	-8
1975	0	-46	0	0	0	-14
1976	0	-63	0	0	0	-21
1977	0	-40	0	0	0	-7
1978	0	-50	0	0	0	-9
1979	0	-47	0	0	0	-6
1980	0	-47	0	0	0	-5
1981	0	-45	0	0	0	-5
1982	0	-53	0	0	0	-9
1983	0	-63	0	0	0	-16
1984	0	-40	0	0	0	-5
1985	0	19	0	0	0	1
1986	0	13	0	0	0	1
1987	0	-5	0	0	0	-1
1988	0	3	0	0	0	0
1989	0	-37	0	0	0	-6
1990	0	-25	0	0	0	-3
1991	0	-7	0	0	0	-1
1992	0	21	0	0	0	1
1993	0	-21	0	0	0	-1
1994	0	-62	0	0	0	-11
1995	0	-46	0	0	0	-5
1996	0	-32	0	0	0	-5
1997	0	-25	0	0	0	-4
1998	0	2	0	0	0	0
1999	0	3	0	0	0	0
2000	0	-29	0	0	0	-4
2001	0	2	0	0	0	0
2002	0	-15	0	0	0	-1
2003	0	-26	0	0	0	-1
2004	0	37	0	0	0	3
2005	0	15	0	0	0	1

Source: Baffes (2007)

Table B.5. Annual NRA Estimates, Côte D'Ivoire, 1961–2005
(percent)

Year	Cassava	Cocoa	Coffee	Cotton	Plantain	Rice	Yam	All covered products
1961	0	-36	-54	—	0	-20.3	0	-31
1962	0	-28	-53	—	0	-25	0	-22
1963	0	-39	-48	—	0	-24	0	-28
1964	0	-31	-52	—	0	-19	0	-33
1965	0	-28	-55	—	0	-22	0	-30
1966	0	-40	-51	-16	0	-36	0	-35
1967	0	-42	-50	-20	0	-50	0	-32
1968	0	-52	-50	-20	0	-40	0	-37
1969	0	-65	-54	-25	0	-38	0	-43
1970	0	-43	-55	-17	0	-12	0	-37
1971	0	-28	-57	-32	0	22	0	-31
1972	0	-33	-55	-33	0	17	0	-33
1973	0	-49	-48	-54	0	55	0	-28
1974	0	-49	-48	-11	0	-21	0	-33
1975	0	-15	-43	-17	0	34	0	-14
1976	0	-53	-84	-35	0	70	0	-61
1977	0	-69	-66	-17	0	53	0	-48
1978	0	-64	-69	-32	0	6	0	-43
1979	0	-50	-58	-24	0	42	0	-32
1980	0	-55	-65	-52	0	-27	0	-41
1981	0	-49	-66	-43	0	-41	0	-42
1982	0	-44	-73	-49	0	-11	0	-38
1983	0	-52	-75	-52	0	-12	0	-43
1984	0	-59	-71	-38	0	3	0	-37
1985	0	-55	-67	-16	0	15	0	-44
1986	0	-47	-58	-30	0	45	0	-32
1987	0	-43	-54	-41	0	38	0	-29
1988	0	-29	-53	-37	0	-25	0	-22
1989	0	-11	-55	-50	0	-31	0	-16
1990	0	-49	-51	-48	0	-11	0	-26
1991	0	-46	-40	-43	0	-18	0	-20
1992	0	-40	-66	-30	0	-9	0	-19
1993	0	-44	-79	-29	0	22	0	-21
1994	0	-42	-53	-42	0	-11	0	-23
1995	0	-42	-27	-36	0	6	0	-19
1996	0	-45	-42	-27	0	-2	0	-26
1997	0	-40	-44	-24	0	34	0	-23
1998	0	-36	-36	-12	0	-7	0	-23
1999	0	-43	-46	-11	0	5	0	-22
2000	0	-39	-32	-12	0	20	0	-18
2001	0	-39	-39	-3	0	35	0	-23
2002	0	-43	-51	-21	0	19	0	-29
2003	0	-56	-58	-23	0	48	0	-33
2004	0	-60	-62	-10	0	19	0	-35
2005	0	-58	-46	-22	0	1	0	-34

Source: Abbott 2007.

Note: — = no data are available.

Table B.6. Annual NRA Estimates, Arab Republic of Egypt, 1955–2005*(percent)*

Year	Beef	Cotton	Maize	Milk	Rice	Sugar	Wheat	All covered products
1955	-21	-21	-45	-77	-71	-34.3	-49	-39
1956	-17	-21	-39	-75	-68	-30.8	-45	-37
1957	-14	-22	-32	-70	-64	-28.6	-41	-34
1958	-8	-22	-25	-64	-60	-22.9	-37	-29
1959	-7	-22	-19	-55	-58	-17.9	-32	-27
1960	-20	-35	-19	-57	-56	-30.4	-40	-35
1961	-29	-55	-42	-73	-60	-41.6	-45	-51
1962	-39	-46	-37	-63	-67	-35	-53	-48
1963	-31	-56	-38	-55	-64	-79	-50	-52
1964	-44	-58	-40	-37	-65	-79	-54	-54
1965	-46	-67	-47	-63	-62	-71	-46	-59
1966	-53	-66	-34	-44	-56	-51	-40	-55
1967	-44	-55	-13	-42	-51	-11	-23	-43
1968	-49	-61	-32	-55	-60	-21	-30	-52
1969	-57	-71	-33	-48	-58	-19	-32	-59
1970	-59	-64	-26	-40	-32	-50	-11	-51
1971	-59	-63	-31	-45	-39	-57	-32	-54
1972	-53	-56	-8	-56	-33	-56	-24	-48
1973	-59	-70	-19	-55	-62	-63	-35	-58
1974	-10	-71	-28	-19	-77	-71	-48	-55
1975	24	-60	-13	-16	-64	-66	-32	-39
1976	19	-41	-15	-28	-27	-33	-22	-22
1977	47	-53	64	-21	16	-8	5	-7
1978	15	-38	52	-36	3	-4	18	-6
1979	-44	-58	31	-44	-42	-21	-32	-42
1980	-27	-56	10	-34	-35	-60	-32	-36
1981	-18	-47	-40	-48	-37	-62	-46	-41
1982	13	-33	-20	-64	-36	-10	-52	-26
1983	66	-21	81	-45	-11	28	-24	14
1984	98	-36	35	-28	21	59	-3	22
1985	34	-57	11	-44	-8	6	-21	-15
1986	193	-21	178	20	10	52	139	68
1987	205	6	386	97	15	170	207	127
1988	187	7	350	102	103	97	128	132
1989	163	-3	262	112	142	82	193	125
1990	-10	-60	44	-5	-26	-36	31	-15
1991	3	-46	60	4	19	-15	115	8

(Table continues on the following page.)

Table B.6. Annual NRA Estimates, Arab Republic of Egypt, 1955–2005 (continued)

Year	Beef	Cotton	Maize	Milk	Rice	Sugar	Wheat	All covered products
1992	-27	-45	10	-29	-20	-35	20	-22
1993	-19	-27	26	-25	-15	-21	31	-11
1994	-4	-23	14	-22	-19	-15	41	-5
1995	24	22	11	-28	-24	-28	-1	-2
1996	35	-36	-7	-26	-22	-16	-7	-9
1997	34	5	35	-18	-27	-18	70	10
1998	42	-25	40	-15	-12	10	39	15
1999	37	-38	36	-10	-6	24	47	15
2000	19	-36	43	-13	-31	59	28	5
2001	1	-50	24	-20	-27	33	8	-9
2002	-10	-51	-12	-34	-39	-20	-15	-24
2003	8	-10	-10	-25	-9	-11	-14	-8
2004	-15	-37	16	-20	-17	4	1	-11
2005	-13	-21	46	-5	-20	-22	28	-4

Source: Cassing, et al. 2007.

Table B.7. Annual NRA Estimates, Ethiopia, 1981–2005
(percent)

Year	Chat	Coffee	Hides, skins	Maize	Oilseed	Pulse	Teff	Wheat	All covered products
1981	-51	-15	-46	-2	-52	-35	-2	-3	-10
1982	-52	-26	-47	-4	-48	-34	-4	-6	-12
1983	-53	-35	-47	-2	-29	-36	-2	-3	-10
1984	-53	-37	-48	-10	-44	-25	-11	-16	-16
1985	-51	-46	-46	-9	-45	-54	-10	-14	-15
1986	-50	-23	-46	-6	-39	-58	-7	-9	-14
1987	-37	-34	-53	-8	-46	-55	-9	-13	-18
1988	-46	-41	-52	-6	-65	-57	-6	-9	-16
1989	-43	-21	-52	-5	-46	-57	-6	-8	-12
1990	-44	-32	-52	-8	-49	-44	-9	-13	-16
1991	-45	-39	-49	-9	-55	-44	-11	-15	-21
1992	-45	-43	-52	-8	-63	-62	-9	-12	-19
1993	-45	-39	-51	-6	-66	-56	-6	-9	-15
1994	-46	-41	-53	-6	-52	-54	-7	-10	-15
1995	-43	-39	-50	-4	-55	-36	-5	-7	-10
1996	-45	-42	-52	-1	-62	-43	-1	-1	-9
1997	-44	-39	-51	-4	-52	-36	-5	-6	-10
1998	-43	-34	-47	-3	-50	-32	-4	-5	-8
1999	-41	-28	-45	-7	-44	-29	-8	-11	-11
2000	-41	-15	-50	-8	-46	-31	-9	-12	-12
2001	-43	-4	-50	-2	-40	-17	-2	-3	-5
2002	-47	2	-49	-7	-32	-14	-8	-11	-10
2003	-26	-10	-47	-10	—	—	-12	0	-7
2004	-41	-7	-46	-4	—	—	-5	0	-3
2005	—	-3	—	-6	—	—	-7	0	-3

Source: Rashid, Assefa, and Ayele 2007.

Note: — = no data are available.

Table B.8. Annual NRA Estimates, Ghana, 1955–2004
(percent)

Year	Cassava	Cocoa	Groundnut	Maize	Plantain	Rice	Yam	All covered products
1955	0	-6	0	-19	0	-8.1	0	-3
1956	0	-5	0	-2	0	-2.9	0	-2
1957	0	-6	0	-34	0	-3.1	0	-3
1958	0	-32	0	3	0	-8.9	0	-15
1959	0	-23	0	-18	0	-8.8	0	-12
1960	0	-15	0	-18	0	-17	0	-8
1961	0	-1	0	27	0	-25	0	0
1962	0	-25	0	-11	0	-54	0	-14
1963	0	-37	0	-15	0	-12	0	-21
1964	0	-39	0	-2	0	-32	0	-24
1965	0	-44	0	-6	0	-29	0	-22
1966	0	-59	0	8	0	-25	0	-25
1967	0	-56	0	-38	0	-43	0	-30
1968	0	-63	0	-8	0	-55	0	-32
1969	0	-64	0	38	0	-33	0	-32
1970	0	-55	0	-6	0	-19	0	-28
1971	0	-22	0	41	0	35	0	-6
1972	0	-49	0	38	0	5	0	-19
1973	0	-62	0	-16	0	-38	0	-31
1974	0	-60	0	-23	0	-58	0	-31
1975	0	-58	0	-14	0	-30	0	-27
1976	0	-84	0	2	0	0	0	-43
1977	0	-92	0	47	0	-22	0	-47
1978	0	-84	0	81	0	-7	0	-35
1979	0	-87	0	-10	0	-48	0	-53
1980	0	-75	0	161	0	5	0	-23
1981	0	-93	0	11	0	-56	0	-46
1982	0	-92	0	-42	0	-50	0	-59
1983	—	—	—	—	—	—	—	—
1984	0	-72	0	95	0	207	0	-1
1985	0	-76	0	18	0	53	0	-18
1986	0	-73	0	46	0	21	0	-19
1987	0	-57	0	172	0	87	0	-1
1988	0	-43	0	79	0	94	0	-1
1989	0	-34	0	14	0	143	0	-3
1990	0	-38	0	60	0	40	0	-4
1991	0	-26	0	66	0	23	0	1
1992	0	-25	0	54	0	25	0	-1

Year	Cassava	Cocoa	Groundnut	Maize	Plantain	Rice	Yam	All covered products
1993	0	-40	0	17	0	24	0	-3
1994	0	-52	0	-4	0	-4	0	-9
1995	0	-34	0	19	0	1	0	-5
1996	0	-38	-2	0	0	1	0	-8
1997	0	-36	21	0	0	18	0	-4
1998	0	-28	43	0	0	10	0	-3
1999	0	-18	10	0	0	24	0	-3
2000	0	-38	-52	39	0	8	0	-7
2001	0	-25	7	67	0	47	0	1
2002	0	-8	-5	22	0	30	0	1
2003	0	-23	-12	17	0	33	0	-5
2004	0	-13	-12	50	0	37	0	-1

Source: Brooks, Croppenstedt, and Aggrey-Fynn 2007.

Note: — = no data are available.

Table B.9. Annual NRA Estimates, Kenya, 1956–2004
(percent)

Year	Coffee	Fruits, vegetables, nontradable	Fruits, vegetables, tradable	Maize	Sugar	Tea	Wheat	All covered products
1956	-13	0	—	54	—	—	3	18
1957	-17	0	—	64	—	2	5	24
1958	-4	0	—	72	—	2	22	33
1959	-10	0	—	48	—	6	19	20
1960	-6	0	—	63	—	6	13	26
1961	1	0	-1	-16	—	16	-2	-7
1962	-12	0	-1	76	—	19	-5	18
1963	20	0	-2	62	—	8	-7	29
1964	-6	0	-1	36	-29	8	27	13
1965	-10	0	-3	-40	93	4	26	-22
1966	-22	0	-12	-32	32	-2	-10	-21
1967	-5	0	-12	53	26	-5	12	16
1968	-11	0	-9	56	68	-17	22	15
1969	-15	0	-15	28	-5	-13	1	1
1970	-24	0	-19	-31	-24	-15	-8	-23
1971	-18	0	-15	-56	-36	-11	-6	-36
1972	-20	0	-22	0	-52	-22	-20	-15
1973	-21	0	-21	-8	-62	-18	-52	-21
1974	-14	0	-11	-26	-66	-11	-49	-26
1975	1	0	-5	3	-69	-5	4	-9
1976	-1	0	-7	7	-54	-3	-2	-2
1977	-9	0	-2	-61	-4	6	8	-30
1978	-7	0	-6	-59	9	3	-5	-29
1979	-5	0	-8	24	-6	-6	-44	-3
1980	-13	0	-12	-60	-65	-12	-31	-38
1981	-21	0	-12	-42	-70	-7	-22	-33
1982	-17	0	-16	-67	-49	-19	-23	-45
1983	-9	0	-10	-24	-24	-24	-13	-19
1984	-17	0	-10	-39	-31	10	-15	-14
1985	-11	0	-3	-10	81	3	-3	-3
1986	-21	0	-4	23	29	6	32	1
1987	-16	0	-12	18	18	-14	56	-1
1988	-24	0	-7	-24	2	-35	20	-22
1989	-2	0	-3	-14	-25	-25	-12	-15
1990	-5	0	-1	0	-41	-13	12	-10
1991	-12	0	-6	-32	-33	-22	16	-22
1992	-32	0	-19	-82	-57	-63	-48	-67

Year	Coffee	Fruits, vegetables, nontradable	Fruits, vegetables, tradable	Maize	Sugar	Tea	Wheat	All covered products
1993	-41	0	-26	-51	-24	-34	-59	-41
1994	-20	0	0	-8	20	-15	26	-9
1995	-6	0	0	-16	36	-25	34	-11
1996	-1	0	-3	-11	4	-20	15	-9
1997	1	0	-3	9	10	-20	57	-1
1998	-15	0	-6	-20	30	-6	36	-9
1999	-3	0	0	12	73	-3	42	8
2000	-8	0	0	-1	8	-3	48	-1
2001	5	0	0	24	-1	7	48	12
2002	-23	0	0	-10	62	-4	53	-1
2003	-2	0	0	-6	55	-1	51	3
2004	11	0	0	-5	58	2	31	5

Source: Winter-Nelson and Argwings-Kodhek 2007.

Note: — = no data are available.

Table B.10. Annual NRA Estimates, Madagascar, 1961–2003
(percent)

Year	Cassava	Clove	Cocoa	Coffee	Maize	Pepper	Rice	Sugar	Vanilla	Yam	All covered products
1961	0	—	—	—	—	—	-27	-2	-62	0	-24
1962	0	—	—	—	—	—	-15	3	-61	0	-13
1963	0	—	—	—	—	—	-21	1	-66	0	-19
1964	0	—	—	—	—	—	-25	0	-53	0	-21
1965	0	—	—	—	—	—	-25	0	-55	0	-21
1966	0	-57	-12	-29	-41	-62	-24	-2	-42	0	-24
1967	0	-54	-20	-20	-25	-48	-5	-2	-57	0	-17
1968	0	-59	-37	-21	0	-41	-40	-2	-52	0	-32
1969	0	-8	-57	-37	-44	16	-21	-2	-57	0	-23
1970	0	8	-29	-15	0	-9	5	-1	-43	0	-2
1971	0	18	-7	-14	13	-19	3	-2	-35	0	-2
1972	0	26	-14	-8	0	6	-1	-1	-34	0	-3
1973	0	-69	-42	-11	0	6	-51	1	-37	0	-38
1974	0	-74	-61	-28	0	-5	-64	-2	-46	0	-55
1975	0	-74	-46	-22	0	-24	-32	-4	-46	0	-28
1976	0	-84	-78	-75	0	-47	-31	-4	-68	0	-47
1977	0	-82	-78	-74	63	-35	13	0	-47	0	-35
1978	0	-85	-85	-76	25	-57	-43	-3	-75	0	-52
1979	0	-78	-69	-68	0	-34	-7	-1	-49	0	-27
1980	0	-85	-58	-60	0	-19	-21	-1	-57	0	-35
1981	0	-91	-58	-58	0	-38	-51	0	-67	0	-52
1982	0	-95	-75	-83	0	-57	-55	-3	-87	0	-63
1983	0	-96	-78	-85	0	-54	-54	-1	-86	0	-58
1984	0	-93	-73	-81	-21	-65	-30	0	-85	0	-49
1985	0	-79	-63	-68	0	-73	16	2	-83	0	-22
1986	0	-80	-58	-59	0	-77	-3	0	-81	0	-20
1987	0	-89	-79	-64	16	-88	-23	-1	-91	0	-39
1988	0	-91	-66	-58	-26	-83	-1	-1	-87	0	-30
1989	0	-86	-36	-44	-23	-78	-2	-1	-85	0	-20
1990	0	-86	-37	-21	40	-71	-3	-1	-84	0	-10
1991	0	-82	-7	-31	53	-27	-6	-1	-89	0	-13
1992	0	-68	-50	-61	14	-16	0	-1	-73	0	-8
1993	0	-45	-52	-69	38	-22	-1	1	-73	0	-8
1994	0	-32	17	38	-2	-15	1	2	-71	0	2
1995	0	-56	0	-31	-30	-50	-4	-1	-69	0	-10
1996	0	-61	-21	-16	0	-49	-2	2	-49	0	-4
1997	0	-74	-35	-20	-41	-78	-3	-1	9	0	-6
1998	0	31	-34	7	0	-70	1	0	-5	0	1
1999	0	24	-24	-4	0	-63	3	-3	-29	0	0
2000	0	-3	-24	-27	40	20	9	-2	-9	0	3
2001	0	-55	1	-18	30	6	9	-1	6	0	-2
2002	0	2	-23	-46	18	-56	6	0	-35	0	-4
2003	0	—	-28	-59	—	—	6	0	—	—	1

Source: Maret 2007.

Note: — = no data are available.

Table B.11. Annual NRA Estimates, Mali, 1970–2005
(percent)

Year	Cassava	Cotton	Millet	Sorghum	Yam	All covered products
1970	0	-47	0	0	0	-2
1971	0	-54	0	0	0	-5
1972	0	-57	0	0	0	-5
1973	0	-78	0	0	0	-11
1974	0	-47	0	0	0	-4
1975	0	-59	0	0	0	-8
1976	0	-73	0	0	0	-17
1977	0	-47	0	0	0	-5
1978	0	-58	0	0	0	-6
1979	0	-43	0	0	0	-5
1980	0	-55	0	0	0	-6
1981	0	-48	0	0	0	-4
1982	0	-61	0	0	0	-7
1983	0	-67	0	0	0	-10
1984	0	-59	0	0	0	-6
1985	0	-6	0	0	0	0
1986	0	-14	0	0	0	-1
1987	0	-25	0	0	0	-3
1988	0	-20	0	0	0	-2
1989	0	-49	0	0	0	-9
1990	0	-33	0	0	0	-6
1991	0	-15	0	0	0	-1
1992	0	21	0	0	0	2
1993	0	-21	0	0	0	-2
1994	0	-64	0	0	0	-17
1995	0	-45	0	0	0	-11
1996	0	-42	0	0	0	-8
1997	0	-40	0	0	0	-11
1998	0	-10	0	0	0	-1
1999	0	-22	0	0	0	-3
2000	0	-32	0	0	0	-5
2001	0	15	0	0	0	2
2002	0	-9	0	0	0	-1
2003	0	-11	0	0	0	-2
2004	0	43	0	0	0	6
2005	0	11	0	0	0	1

Source: Baffes 2007.

Table B.12. Annual NRA Estimates, Mozambique, 1976–2003
(percent)

Year	Bean	Cashew	Cassava	Cotton	Groundnut	Maize (South)	Maize (Center and North)	Millet
1976	—	-79	0	-79	-79	-86	-86	0
1977	—	-92	0	-85	-82	-83	-74	0
1978	—	-86	0	-43	-53	-50	-88	0
1979	—	-85	0	-50	-58	-35	25	0
1980	—	-90	0	-48	-74	-52	-62	0
1981	—	-90	0	-53	-49	-46	-48	0
1982	—	-82	0	-52	-51	-29	-56	0
1983	—	-89	0	-69	-71	-53	-57	0
1984	—	-99	0	-97	-95	-94	-57	0
1985	—	-98	0	-97	-95	-91	-57	0
1986	—	-99	0	-96	-96	-94	-57	0
1987	—	-98	0	-80	-77	-64	-72	0
1988	—	-79	0	-53	-63	-42	-59	0
1989	—	-76	0	0	5	-40	-63	0
1990	—	-75	0	0	5	8	0	0
1991	—	-65	0	0	5	8	0	0
1992	—	-58	0	0	5	8	0	0
1993	26	-79	0	-3	5	8	0	0
1994	26	-88	0	-3	5	8	0	0
1995	26	-33	0	-3	5	8	0	0
1996	42	-15	0	-3	8	8	0	0
1997	42	-9	0	-2	8	8	0	0
1998	58	-7	0	-2	20	8	0	0
1999	52	-4	0	-2	52	—	0	0
2000	52	-1	0	-2	46	20	0	0
2001	52	-12	0	-2	46	20	0	0
2002	52	-5	0	-2	46	20	0	0
2003	46	-4	0	-2	46	20	0	0

Year	Potato	Rice	Sorghum	Sugar	Tobacco	Yam	All covered products
1976	0	-85	0	-80	-78	0	-64
1977	0	-82	0	-79	-80	0	-64
1978	0	-56	0	-44	-53	0	-44
1979	0	-45	0	-36	-46	0	-21
1980	0	-46	0	-58	-27	0	-45
1981	0	-46	0	-58	-45	0	-33
1982	0	-26	0	-58	-51	0	-25
1983	0	-48	0	-61	-71	0	-31
1984	0	-94	0	-93	-95	0	-75
1985	0	-91	0	-94	-96	0	-74
1986	0	-93	0	-96	-70	0	-79
1987	0	-67	0	-49	-54	0	-50
1988	0	-64	0	-43	-35	0	-30
1989	0	-63	0	-47	-18	0	-25
1990	0	-51	0	-38	-52	0	-8
1991	0	-43	0	36	-56	0	-3
1992	0	-59	0	31	6	0	-3
1993	0	-49	0	31	-44	0	-2
1994	0	-46	0	34	-12	0	-4
1995	0	-40	0	6	-33	0	2
1996	0	13	0	40	-62	0	4
1997	0	—	0	152	0	0	5
1998	0	—	0	146	0	0	6
1999	0	26	0	108	0	0	8
2000	0	26	0	94	0	0	7
2001	0	26	0	97	0	0	6
2002	0	—	0	114	0	0	8
2003	0	—	0	102	—	0	8

Source: Alfieri, Arndt, and Cirera 2007.

Note: — = no data are available.

Table B.13. Annual NRA Estimates, Nigeria, 1961–2004
(percent)

Year	Cassava	Cocoa	Cotton	Groundnut	Maize	Millet	Palm oil	Rice	Sorghum	Yam	All covered products
1961	0	-31	-76	-15	279	0	-18	70	238	0	23
1962	0	-30	-77	-17	310	0	-13	68	248	0	28
1963	0	-42	-77	-29	214	0	-35	51	176	0	16
1964	0	-38	-74	-23	234	0	-34	70	202	0	18
1965	0	-54	-74	-34	144	0	-43	49	201	0	15
1966	0	-36	-66	-29	249	0	-34	60	278	0	20
1967	0	-63	-73	-45	98	0	-42	-12	197	0	7
1968	0	-62	-53	-55	160	0	-10	4	215	0	13
1969	1	-65	-70	-65	182	0	-26	4	157	0	7
1970	0	-69	-78	-68	109	0	-57	33	165	0	-2
1971	1	-58	-78	-69	208	0	-51	103	194	0	10
1972	1	-39	-74	-59	287	1	-25	87	305	1	12
1973	1	-34	-73	-63	108	1	-47	-4	177	1	10
1974	1	-44	-77	-35	66	1	-42	-33	129	0	5
1975	1	-37	-56	-10	122	1	-8	8	149	1	11
1976	1	-39	-69	-10	256	1	20	103	203	1	16
1977	1	-64	-82	86	153	1	-58	7	171	1	-5
1978	1	-62	-75	-40	178	1	-27	-4	261	1	2
1979	3	-58	-77	30	122	2	-13	30	134	2	3
1980	4	2	-71	-51	199	3	1	27	113	3	9
1981	3	29	-66	-48	276	3	1	35	245	2	11

1982	4	-11	-68	42	341	4	-4	98	239	3	17
1983	4	-64	-91	-74	53	3	-62	15	31	2	-5
1984	1	-67	-68	-20	82	0	-63	71	129	0	7
1985	2	-72	-50	-5	127	2	-43	109	165	1	13
1986	1	-76	-78	-16	363	1	-19	29	95	1	20
1987	0	-33	-75	55	264	0	-27	129	348	0	27
1988	0	-26	-94	42	88	0	80	55	131	0	9
1989	1	44	-81	-47	59	1	-50	11	77	0	4
1990	1	18	-81	-56	92	1	-49	57	122	1	4
1991	0	15	-69	226	107	0	95	31	127	0	13
1992	0	-35	-91	-57	84	0	97	0	103	0	-2
1993	0	-40	-94	-78	37	0	-10	-18	54	0	-7
1994	-5	20	-78	-48	48	-5	405	-15	118	-5	13
1995	-5	46	-79	-63	56	-5	191	-17	73	-5	3
1996	-5	10	-85	-45	9	-5	27	-24	26	-5	-5
1997	-5	22	-81	-35	83	-5	7	3	104	-5	1
1998	-5	-31	-84	-37	226	-5	3	-3	112	-5	0
1999	-5	-34	-85	-37	271	-5	-22	21	132	-5	1
2000	-5	-37	-82	-53	189	-5	-24	14	164	-5	-3
2001	-3	-16	-81	-55	66	-4	-17	30	76	-4	-4
2002	-4	-14	-84	-59	58	-4	-13	12	63	-4	-6
2003	-5	-31	-85	-61	43	-5	-9	5	51	-5	-8
2004	-4	16	-79	-60	36	-4	0	-12	49	-4	-6

Source: Walkenhorst 2007.

Table B.14. Annual NRA Estimates, South Africa, 1961–2005
(percent)

Year	Apple, nontradable	Apple, tradable	Grape, nontradable	Grape, tradable	Maize, yellow	Maize, white	Orange, nontradable	Orange, tradable
1961	0	-5	0	-24	17	2	0	-3
1962	0	-5	0	-30	4	-11	0	-3
1963	0	-15	0	-10	-3	-18	0	2
1964	0	0	0	-19	1	-15	0	-26
1965	0	-6	0	-27	5	-11	0	-24
1966	0	2	0	-30	12	-3	0	-6
1967	0	-26	0	-26	14	-2	0	-13
1968	0	5	0	-12	33	12	0	-12
1969	0	5	0	-9	31	9	0	-34
1970	0	-3	0	-6	12	-6	0	-43
1971	0	-14	0	-21	19	-5	0	-36
1972	0	40	0	19	25	-5	0	-54
1973	0	-1	0	17	-14	-36	0	-47
1974	0	-12	0	6	-20	-48	0	-22
1975	0	-20	0	21	-10	-43	0	-27
1976	0	-34	0	6	-14	-39	0	-14
1977	0	25	0	-10	20	-9	-1	-52
1978	-1	0	-1	17	30	1	-2	-15
1979	-2	-24	-2	-32	43	12	-2	-34
1980	-2	-15	-2	-22	74	37	-2	15
1981	-2	-49	-2	-42	62	27	-3	-33
1982	-3	6	-3	-41	87	47	-3	-28
1983	-3	-13	-3	-38	-13	21	-4	-7

1984	-4	-16	-4	-23	-14	-31	-6	-24
1985	-6	24	-6	5	16	-42	-6	-38
1986	-6	25	-6	61	98	66	-6	-7
1987	-6	39	-6	39	218	143	-6	-17
1988	-6	-17	-6	21	69	-23	-6	-40
1989	-6	-5	-6	-7	30	34	-7	11
1990	-7	11	-7	-6	56	59	-5	-2
1991	-5	5	-5	-4	78	81	0	-8
1992	0	-7	0	56	4	-3	0	4
1993	0	-2	0	-11	86	-11	0	-15
1994	0	38	0	-8	56	38	0	-1
1995	0	-3	0	4	93	-15	0	-4
1996	0	8	0	1	22	0	0	23
1997	0	-5	0	12	-14	83	0	5
1998	0	-1	0	14	-27	-26	0	-17
1999	0	-36	0	14	-10	-18	0	8
2000	0	2	0	-6	39	20	0	29
2001	0	-10	0	49	54	-27	0	-16
2002	0	6	0	2	-2	8	0	26
2003	0	2	0	-2	-20	-30	0	8
2004	0	2	0	-2	-19	-32	0	10
2005	0	2	0	-1	66	13	0	21

(Table continues on the following page.)

Table B.14. Annual NRA Estimates, South Africa, 1961–2005 (continued)

Year	Poultry	Sheep meat	Sugar	Sunflower	Wheat	All covered products
1961	-13	-6	33	9	2	0
1962	-13	37	33	23	-1	12
1963	-13	18	33	24	-7	4
1964	-13	29	33	20	-2	-2
1965	-13	12	22	12	6	1
1966	-13	14	36	11	10	8
1967	-13	12	61	23	9	11
1968	-13	11	64	20	15	16
1969	-13	18	34	23	19	12
1970	-31	13	27	13	16	1
1971	-15	65	-15	8	21	4
1972	-16	80	-29	14	87	6
1973	-10	33	-6	6	7	-5
1974	-7	9	-53	-10	-3	-22
1975	-21	66	-41	0	24	-10
1976	-34	65	-12	8	38	-3
1977	-29	42	24	9	89	10
1978	-22	15	13	14	71	14
1979	-12	6	33	6	85	8
1980	20	47	-25	29	8	15
1981	23	36	8	23	8	31
1982	6	7	65	20	118	45
1983	31	42	142	27	121	46
1984	12	10	58	1	81	19

1985	-21	-5	63	-3	42	-4
1986	-13	35	54	16	92	21
1987	9	75	51	19	154	42
1988	18	54	22	2	69	15
1989	-7	4	5	2	-27	4
1990	-3	10	-3	8	6	10
1991	-4	30	25	18	18	10
1992	5	40	109	13	16	2
1993	20	40	123	1	16	2
1994	14	45	141	-5	12	22
1995	15	32	55	-5	7	13
1996	20	12	13	-7	-5	11
1997	21	25	40	-8	-5	17
1998	4	23	30	-15	-8	-6
1999	5	25	42	1	11	-1
2000	-2	51	49	-1	20	7
2001	-15	0	28	-15	4	-8
2002	-10	-23	1	-7	-1	-6
2003	20	-7	78	0	10	6
2004	20	-3	53	4	15	3
2005	22	6	57	1	-1	19

Source: Kirsten, Edwards, and Vink 2007.

Table B.15. Annual NRA Estimates, Senegal, 1961–2004
(percent)

Year	Cotton	Groundnut	Millet	Rice	All covered products
1961	—	-24	0	8	-18
1962	—	-19	0	10	-14
1963	—	-20	0	8	-15
1964	—	-16	0	12	-11
1965	—	-16	0	23	-11
1966	—	-18	0	12	-11
1967	—	-11	0	-13	-9
1968	—	-9	0	-18	-6
1969	—	-32	0	-10	-22
1970	-39	-36	0	15	-21
1971	-49	-29	0	31	-23
1972	-49	-39	0	29	-26
1973	-69	-53	0	-26	-43
1974	-34	-64	0	-60	-53
1975	-45	-45	0	5	-35
1976	-62	-39	0	42	-29
1977	-45	-40	0	40	-23
1978	-55	-52	0	12	-40
1979	-45	-62	0	52	-40
1980	-46	-67	0	4	-43
1981	-41	-65	0	-24	-54
1982	-56	-9	0	17	-6
1983	-70	-30	0	3	-17
1984	-65	-52	0	33	-32
1985	0	-42	0	68	-16
1986	-8	-9	0	142	5
1987	-15	26	0	172	28
1988	-12	9	0	73	13
1989	-39	-21	0	42	-4
1990	-27	-13	0	102	6
1991	-6	-12	0	162	4
1992	22	17	0	147	18
1993	10	16	0	142	31
1994	-54	-34	0	32	-26
1995	-42	-15	0	10	-12
1996	-31	-9	0	1	-8
1997	-38	-18	0	-14	-12
1998	-12	-5	0	2	-3
1999	-10	-21	0	-9	-15
2000	-30	-35	0	6	-24
2001	-5	-34	0	-1	-22
2002	-16	-20	0	11	-8
2003	-23	-2	0	13	-1
2004	24	-14	0	1	-5

Source: Masters 2007.

Note: — = no data are available.

Table B.16. Annual NRA Estimates, Sudan, 1955–2004*(percent)*

Year	Beef	Camel	Cotton	Groundnut	Gum arabic	Milk	Millet	Sesame	Sheep meat	Sorghum	Sugar	Wheat	All covered products
1955	24	-2	2	-32	-46	-17.9	-80	-37	-6	-35	—	7	-18
1956	26	7	-6	-42	-41	-3.2	-78	-31	1	-20	—	8	-13
1957	3	14	-9	-33	-41	35.4	-77	-30	-22	-40	—	10	-12
1958	-40	40	18	-47	1	69.7	-75	-54	-45	-34	—	12	-17
1959	-25	-32	35	-53	-39	13.0	-74	-49	-40	-47	—	13	-20
1960	-33	-29	3	-58	-43	30.8	-73	-46	-39	-51	—	26	-22
1961	-37	-31	8	-56	-35	33	-72	-51	-42	-52	47	12	-22
1962	-29	-36	3	-52	-13	25	-71	-57	-45	-44	47	8	-21
1963	-40	-48	12	-53	-35	13	-74	-56	-46	-46	50	-4	-26
1964	-42	-51	0	-58	-41	-6	-75	-53	-52	-51	26	-18	-36
1965	-49	-58	-1	-52	-30	0	-73	-55	-49	-42	22	-11	-33
1966	-50	-65	8	-61	-25	-1	-73	-59	-53	-40	40	14	-33
1967	-38	-66	-24	-50	-48	-32	-76	-65	-51	-30	41	-7	-40
1968	-33	-60	-17	-36	-56	-22	-68	-69	-50	-39	49	39	-37
1969	-53	-59	-25	-59	-52	-26	-69	-70	-57	-50	54	-32	-42
1970	-62	-69	-23	-59	-47	-27	-40	-60	-69	-46	89	-16	-47
1971	-51	-53	1	-63	-57	-39	-63	-67	-62	-62	90	-39	-46
1972	-49	1	1	-54	-55	-48	-56	-64	-59	-54	59	-29	-43
1973	-71	-28	2	-60	-57	-48	-28	-64	-63	-57	33	-43	-51
1974	-66	-23	-32	-63	-76	-44	-19	-72	-71	-53	-46	-51	-55
1975	-26	5	-26	-58	-42	-24	-29	-67	-55	-52	-51	-21	-40
1976	-43	22	-16	-50	-54	42	-19	-63	-40	-43	-5	-11	-27
1977	-50	19	-7	-64	-53	56	-24	-68	-63	-23	65	8	-28
1978	-25	48	8	-60	-45	44	0	-68	-43	-29	84	86	-19
1979	-16	54	4	-63	-43	14	-21	-73	-49	-52	40	-9	-28
1980	-19	-18	6	-61	-63	-20	-11	-64	-45	-65	-51	-15	-36

(Table continues on the following page.)

Table B.16. Annual NRA Estimates, Sudan, 1955–2004 (continued)

Year	Beef	Camel	Cotton	Groundnut	Gum arabic	Milk	Millet	Sesame	Sheep meat	Sorghum	Sugar	Wheat	All covered products
1981	-13	48	29	-62	-59	-13	46	-59	-22	-31	-33	-23	-21
1982	-38	32	17	-39	-52	-41	-28	-59	-45	-61	-37	27	-40
1983	-55	-2	-15	-53	-69	-8	-17	-51	-43	-37	-30	-12	-38
1984	-39	-56	-26	-62	-62	65	-21	-64	-57	-49	-28	-11	-30
1985	-63	-30	-25	-51	-66	116	-20	-29	-64	-25	-20	28	-28
1986	-67	-57	23	-42	-80	54	-59	-63	-61	-52	-42	-13	-43
1987	-61	-84	27	-22	-67	91	42	-57	-71	-45	-5	4	-42
1988	-55	-81	-17	-18	-51	92	63	-39	-57	-37	2	47	-30
1989	-64	-94	-12	-34	-69	43	13	-54	-59	41	-16	92	-51
1990	-48	-75	-3	8	-49	18	31	-58	-67	95	93	153	-25
1991	-74	-79	-34	-17	-78	-39	332	-2	-69	390	-6	291	-34
1992	-88	-85	-52	-64	-85	-68	-27	-61	-83	-34	-69	-65	-76
1993	-79	-93	-44	-48	-29	-71	1	-66	-72	-60	-69	-75	-75
1994	-84	-95	-26	-61	-45	-5	44	-54	-72	-13	-50	-9	-60
1995	-43	4	0	-33	-36	-28	81	-30	-73	-21	-42	-49	-38
1996	-67	-48	-5	-71	-70	-34	90	-63	-80	-52	-66	-31	-52
1997	-60	67	-9	-45	-50	-19	-29	-59	-47	-2	18	-24	-31
1998	-47	29	-18	-55	-70	39	-35	-47	-52	-29	-47	0	-22
1999	2	66	-20	-58	-73	33	-63	-50	-37	0	15	5	-3
2000	-49	76	-10	-18	-73	60	-6	-55	-34	51	104	44	-7
2001	-67	56	22	-38	-67	30	3	-53	-44	-4	83	30	-33
2002	-19	66	46	-26	-56	9	-11	-53	-39	-31	164	21	-10
2003	-50	62	11	-31	-60	44	6	-32	-31	-45	136	21	-15
2004	-40	178	15	-32	-80	3	10	2	24	-26	116	-5	-9

Source: Faki and Taha 2007.

Note: — = no data are available.

Table B.17. Annual NRA Estimates, Tanzania, 1976–2004
(percent)

Year	Bean	Cashew	Cassava	Coffee	Cotton	Maize	Millet	Plantain	Potato	Pyrethrum
1976	-84	-65	0	-68	-88	-24	0	0	0	-87
1977	-79	-62	0	-72	-87	-51	0	0	0	-92
1978	-76	-69	0	-63	-75	-55	0	0	0	-76
1979	-67	-69	0	-74	-82	-76	0	0	0	-74
1980	-83	-86	0	-81	-88	-57	0	0	0	-80
1981	-69	-85	0	-67	-87	-57	0	0	0	-69
1982	-55	-49	0	-68	-85	-35	0	0	0	-62
1983	-86	-70	0	-78	-88	-54	0	0	0	-70
1984	-88	-68	0	-77	-90	-56	0	0	0	-77
1985	-83	-46	0	-74	-83	68	0	0	0	-71
1986	-87	-81	0	-83	-80	-13	0	0	0	-85
1987	-82	-82	0	-79	-82	-4	0	0	0	-77
1988	-81	-75	0	-81	-89	-17	0	0	0	-80
1989	-77	-61	0	-70	-87	-21	0	0	0	-55
1990	-79	-49	0	-54	-91	-42	0	0	0	-17
1991	-62	-43	0	-51	-87	-41	0	0	0	-17
1992	-43	-35	0	-42	-78	68	0	0	0	-25
1993	-4	-32	0	-50	-84	30	0	0	0	-52
1994	-35	-36	0	-23	-87	54	0	0	0	-74
1995	-43	-10	0	0	-84	-29	0	0	0	-68
1996	-33	0	0	0	-68	-3	0	0	0	-67
1997	-45	-18	0	0	-78	2	0	0	0	-71
1998	-64	-5	0	0	-71	-39	0	0	0	-72
1999	-55	-7	0	0	-63	-71	0	0	0	-61
2000	-42	0	0	0	-81	-39	0	0	0	-49
2001	-24	2	0	0	-66	-42	0	0	0	-43
2002	-38	-24	0	0	-69	16	0	0	0	-41
2003	-56	-7	0	0	-74	47	0	0	0	-48
2004	-65	-19	0	0	-61	12	0	0	0	-57

(Table continues on the following page.)

Table B.17. Annual NRA Estimates, Tanzania, 1976–2004 (continued)

Year	Rice	Sisal	Sorghum	Sugar	Tea	Tobacco	Wheat	Yam	All covered products
1976	-67	—	0	-40	-95	-70	-60	0	-52
1977	-53	—	0	9	-95	—	-15	0	-54
1978	-41	—	0	2	-86	-60	-12	0	-44
1979	-42	-39	0	-6	-86	-63	-39	0	-51
1980	-71	-37	0	-74	-94	-62	-67	0	-60
1981	-67	-20	0	-77	-92	-59	-58	0	-59
1982	-50	-31	0	-55	-94	-66	-37	0	-50
1983	-67	-55	0	-47	-94	-69	-58	0	-67
1984	-66	-60	0	-36	-96	-74	-54	0	-66
1985	-35	-49	0	39	-92	-64	-24	0	-41
1986	-31	-27	0	-22	-95	-67	-39	0	-58
1987	-44	-49	0	-6	-93	-64	-44	0	-53
1988	-37	-25	0	-42	-94	-68	-66	0	-56
1989	-52	5	0	-43	-93	-62	-63	0	-51
1990	-60	-4	0	-29	-94	-75	-68	0	-57
1991	-51	-12	0	13	-90	-77	-27	0	-49
1992	15	-23	0	26	-87	-55	18	0	-22
1993	55	9	0	73	-88	-34	148	0	-9
1994	51	-36	0	31	-89	-41	152	0	-12
1995	—	-3	0	9	-88	-41	46	0	-30
1996	65	0	0	66	-91	-33	43	0	-18
1997	56	0	0	100	-92	-28	208	0	-19
1998	11	0	0	3	-94	-32	71	0	-36
1999	-32	0	0	21	-89	-51	14	0	-43
2000	-4	0	0	72	-93	-45	121	0	-23
2001	32	0	0	96	-91	-50	138	0	-18
2002	38	0	0	96	-90	-61	107	0	-11
2003	25	0	0	137	-90	-59	61	0	-8
2004	-10	0	0	115	-91	-61	51	0	-23

Source: Morrisey and Leyaro 2007.

Note: — = no data are available.

Table B.18. Annual NRA Estimates, Togo, 1970–2005
(percent)

Year	Cassava	Cotton	Millet	Sorghum	Yam	All covered products
1970	0	-28	0	—	0	0
1971	0	-42	0	—	0	0
1972	0	-43	0	—	0	0
1973	0	-65	0	—	0	-1
1974	0	-34	0	—	0	-1
1975	0	-42	0	—	0	-1
1976	0	-65	0	—	0	-1
1977	0	-38	0	—	0	0
1978	0	-46	0	0	0	-1
1979	0	-44	0	0	0	-1
1980	0	-53	0	0	0	-1
1981	0	-48	0	0	0	-1
1982	0	-63	0	0	0	-2
1983	0	-70	0	0	0	-3
1984	0	-57	0	0	0	-4
1985	0	-2	0	0	0	0
1986	0	-8	0	0	0	0
1987	0	-21	0	0	0	-2
1988	0	-22	0	0	0	-2
1989	0	-44	0	0	0	-4
1990	0	-31	0	0	0	-3
1991	0	-12	0	0	0	-1
1992	0	6	0	0	0	0
1993	0	-19	0	0	0	-1
1994	0	-59	0	0	0	-15
1995	0	-41	0	0	0	-5
1996	0	-35	0	0	0	-5
1997	0	-29	0	0	0	-4
1998	0	-8	0	0	0	-1
1999	0	-2	0	0	0	0
2000	0	-24	0	0	0	-3
2001	0	7	0	0	0	1
2002	0	-19	0	0	0	-2
2003	0	-28	0	0	0	-3
2004	0	6	0	0	0	0
2005	0	-5	0	0	0	0

Source: Baffes 2007.

Note: — = no data are available.

Table B.19. Annual NRA Estimates, Uganda, 1961–2004
(percent)

Year	Bean	Cassava	Coffee	Cotton	Groundnut	Maize	Millet	Plantain	Rice	Sorghum	Sugar	Tea	Yam	All covered products
1961	-1	0	-4	-11	0	-1	0	0	12	0	-1	-1	0	-2
1962	26	0	-6	-16	0	-1	0	0	14	0	-1	-1	0	-1
1963	0	0	-14	-13	0	-1	0	0	14	0	-1	-1	0	-3
1964	-2	0	-21	-14	0	-2	0	0	15	0	-2	-2	0	-5
1965	28	0	-18	-11	0	0	0	0	15	0	0	0	0	-2
1966	-2	0	-15	-14	0	-2	0	0	16	0	-2	-2	0	-4
1967	-10	0	-26	-22	0	0	0	0	23	0	-10	-10	0	-7
1968	-9	0	-24	-22	0	0	0	0	22	0	-9	-9	0	-6
1969	0	0	-26	-25	0	19	0	0	24	0	-12	-12	0	-7
1970	-16	0	-32	-25	0	22	0	0	26	0	-16	-16	0	-6
1971	0	0	-38	-29	0	0	0	0	29	0	29	-20	0	-5
1972	0	0	-45	-34	0	0	0	0	35	0	34	-28	0	-8
1973	0	0	-62	-53	0	53	0	0	54	0	54	-50	0	-14
1974	0	0	-78	-71	0	0	0	0	70	0	0	-68	0	-25
1975	0	0	-84	-78	0	0	0	0	77	0	0	-75	0	-25
1976	0	0	-93	-81	0	0	0	0	83	0	-79	-79	0	-26
1977	0	0	-94	-76	0	0	0	0	0	0	76	-73	0	-25
1978	0	0	-95	-84	0	0	0	0	0	0	0	-82	0	-33
1979	0	0	-87	-79	0	0	0	0	80	0	80	-79	0	-13
1980	0	0	-87	-82	0	83	0	0	83	0	83	-82	0	-9
1981	0	0	-69	-60	0	61	0	0	62	0	62	-60	0	-4

1982	0	0	-68	-51	0	53	0	0	54	0	0	-51	0	-15
1983	0	0	-70	-41	0	-41	0	0	44	0	0	-41	0	-15
1984	0	0	-64	-27	0	-27	0	0	29	0	29	-27	0	-14
1985	0	0	-71	-56	0	-49	0	0	51	0	51	-49	0	-15
1986	0	0	-75	-71	0	0	0	0	67	0	67	-66	0	-23
1987	0	0	-72	-61	0	0	0	0	62	0	62	61	0	-15
1988	0	0	-68	-60	0	0	0	0	0	0	62	60	0	-9
1989	0	0	-53	-44	0	-44	0	0	47	0	47	44	0	-8
1990	0	0	-36	-20	0	-20	0	0	0	0	25	20	0	-2
1991	-12	0	-20	-12	0	-12	0	0	0	0	17	12	0	-2
1992	-4	0	-5	-4	0	-4	0	0	0	0	11	4	0	-1
1993	-1	0	-1	-1	0	-1	0	0	10	0	9	1	0	0
1994	-1	0	-3	-1	0	-1	0	0	12	0	12	1	0	0
1995	0	-1	-4	0	-1	0	-1	-1	13	-1	13	0	-1	0
1996	0	0	-3	0	0	0	0	0	13	0	14	0	0	0
1997	0	0	-1	0	0	10	0	0	12	0	15	0	0	1
1998	20	0	-1	0	0	11	0	0	14	0	18	0	0	1
1999	0	0	-1	0	0	12	0	0	14	0	19	0	0	1
2000	0	0	-1	0	0	0	0	0	14	0	20	0	0	0
2001	0	0	-1	0	0	0	0	0	19	0	17	0	0	1
2002	0	0	-1	0	0	0	0	0	17	0	16	0	0	1
2003	0	0	-1	0	0	0	0	0	19	0	16	0	0	0
2004	0	0	-1	0	0	0	0	0	18	0	15	0	0	1

Source: Matthews, Claquin, and Opolot 2007.

Table B.20. Annual NRA Estimates, Zambia, 1961–2004
(percent)

Year	Cotton	Groundnut	Maize	Millet	Rice	Sorghum	Soybean	Sunflower	Tobacco, Virginia	Tobacco, burley	Wheat	All covered products
1961	—	—	-22	—	—	—	—	—	-10	-34	—	-21
1962	—	—	-32	—	—	—	—	—	-14	-2	—	-29
1963	—	—	-44	—	—	—	—	—	-7	-23	—	-38
1964	—	—	-9	—	—	—	—	—	-5	-9	—	-9
1965	-27	-51	-2	—	—	—	—	—	3	-32	—	-11
1966	-39	-41	-20	0	—	-12	—	—	-10	-45	-73	-22
1967	-20	-22	-27	0	—	13	—	0	-6	-65	-76	-22
1968	-38	-38	-42	0	-24	-30	—	0	-40	-48	-76	-38
1969	-33	-55	-77	0	-20	-32	—	0	-38	-47	-82	-69
1970	-20	-42	-24	0	-58	-22	—	0	-13	-24	-63	-25
1971	-18	-56	-55	0	-64	-21	—	0	-25	-34	-71	-50
1972	-45	-67	-42	0	-59	-44	—	0	-27	-40	-68	-43
1973	-62	-64	-40	0	-54	-50	-82	0	-44	-50	-54	-45
1974	-38	-68	-46	0	-30	-36	-65	0	-45	-37	-44	-47
1975	-33	-76	-64	0	-11	-48	-68	0	-54	-32	-34	-63
1976	-45	-55	-32	0	-24	-62	12	0	-56	-42	-30	-39
1977	-54	-76	-76	0	-22	-73	-72	0	-72	-65	-50	-74
1978	-40	-74	-68	0	-20	-72	-66	0	-67	-68	-26	-66
1979	-21	-62	-47	0	7	-66	-4	0	-38	-42	-1	-45
1980	-40	-79	-51	0	12	-72	-40	0	-1	-2	-6	-49
1981	-11	-56	-10	0	3	-55	-28	0	-46	-50	22	-13

1982	-34	-58	-4	0	53	-52	-10	0	-23	-39	39	-8
1983	-44	-67	-12	0	47	-43	-32	0	-11	-34	29	-15
1984	-61	-72	-40	0	35	-64	-58	0	-52	-62	-22	-42
1985	-61	-69	-53	0	-7	-64	-45	0	-60	-68	-60	-52
1986	-67	-69	-52	0	-33	-60	1	0	-82	-85	-42	-54
1987	-91	-91	-79	0	-78	-80	-92	0	-89	-89	-87	-82
1988	-87	-81	-85	0	-81	-89	-90	0	-81	-85	-87	-85
1989	-76	-81	-68	0	-55	-76	-77	0	-74	-74	-71	-69
1990	-77	-92	-77	0	-70	-82	-86	0	-73	-75	-82	-79
1991	-70	-89	-66	0	-62	-71	-65	0	-36	-28	-84	-69
1992	13	-74	-53	0	-65	-62	-45	0	-73	-74	-74	-51
1993	-57	-75	-20	0	66	-34	-69	0	12	50	-78	-31
1994	16	-55	-47	0	-4	-19	-9	0	15	9	17	-37
1995	-2	-40	-17	0	72	-8	-39	0	-4	-16	0	-15
1996	-5	-75	-52	0	37	-61	-24	0	59	17	60	-46
1997	-19	-62	-31	0	-23	-54	-17	0	-5	-32	-7	-31
1998	-44	-88	-32	0	-13	-73	-26	0	-46	-54	11	-47
1999	-68	-68	-9	0	-26	-59	-49	0	-30	-35	-4	-29
2000	-53	-78	-53	0	-48	-64	23	0	-8	-46	10	-50
2001	-51	-79	-37	0	-19	-67	-44	0	-19	-49	12	-41
2002	-64	-71	-9	0	-31	-12	-29	0	-35	-63	7	-27
2003	-38	-48	-4	0	3	5	28	0	-56	-71	20	-19
2004	—	—	-47	0	—	12	-56	—	-28	-61	68	-41

Source: Robinson, Govereh, and Ndelela 2007.

Note: — = no data are available.

Table B.21. Annual NRA Estimates, Zimbabwe, 1955–2004
(percent)

Year	Cotton	Groundnut	Maize	Sorghum	Soybean	Sunflower	Tobacco	Wheat	All covered products
1955	-92	-45	47	—	—	—	—	17	27
1956	-88	-46	34	—	—	—	—	51	20
1957	-87	-39	51	—	—	—	—	18	34
1958	-86	-29	28	—	—	—	—	21	18
1959	-81	-35	35	—	—	—	—	28	21
1960	-47	-33	24	11	—	0.0	-56	23	-48
1961	113	-32	-20	1	—	0	-39	42	-35
1962	261	-22	-5	-13	—	0	-33	38	-26
1963	68	-82	-12	-25	—	0	-39	32	-38
1964	25	-81	-12	-23	—	0	-47	34	-46
1965	-27	-87	-60	-18	—	0	-33	42	-49
1966	-26	-80	-20	44	—	0	-22	57	-27
1967	-27	-78	-13	-17	—	0	-43	78	-37
1968	-29	-74	-6	-43	0	0	-45	58	-29
1969	-29	-78	-10	-49	-29	0	-53	47	-37
1970	-53	-82	40	-63	-43	0	-62	6	-44
1971	-51	-82	-23	-62	-40	0	-58	29	-44
1972	-47	-68	-42	-38	-41	0	-50	47	-45
1973	-52	-72	-40	-56	-11	0	-38	16	-44
1974	-14	-70	-46	-66	-7	0	-21	-23	-44
1975	-42	-74	-49	-60	-35	0	-55	-20	-53
1976	-65	-79	-60	-61	-52	0	-61	-28	-64
1977	-67	-78	-42	-28	-59	0	-54	-2	-57
1978	-60	-73	-32	-25	-20	0	-46	-39	-50

1979	-48	-62	-45	-19	-44	0	-49	-29	-48
1980	-54	-73	-44	-25	-54	0	-56	-25	-52
1981	-44	-65	-40	-7	-58	0	-19	-17	-39
1982	-17	-55	-22	-24	-25	0	-42	4	-30
1983	-77	-75	-14	-57	-61	0	-65	2	-61
1984	-70	-75	-34	-41	-13	0	-47	-22	-51
1985	-61	-32	-28	-35	-24	0	-44	-21	-41
1986	-31	-57	-38	-6	-30	0	-47	0	-40
1987	-32	-41	-20	-41	-22	0	-57	28	-40
1988	-49	-26	-45	-56	-45	0	-32	-11	-40
1989	-67	-52	-49	-46	-47	0	-50	-40	-52
1990	-56	-50	-48	-58	-27	0	-25	-51	-40
1991	-75	-72	-62	-66	-65	0	-31	-50	-51
1992	-77	5	-72	-63	-60	0	-53	-62	-58
1993	-47	-69	-49	-57	-38	0	-44	-50	-47
1994	-32	-61	-14	-74	-52	0	-32	-23	-28
1995	-30	-60	3	-80	-33	0	-24	-55	-27
1996	-30	-36	-32	-69	-49	0	-22	-25	-27
1997	-33	-8	-37	-55	-65	0	-42	-36	-38
1998	-42	-56	-24	-87	-67	0	-44	-56	-43
1999	-44	-69	-74	-80	-57	0	-43	-47	-57
2000	-44	-76	17	-45	-54	0	-59	-69	-49
2001	-80	-81	-91	-75	-81	0	-64	-81	-82
2002	-88	-75	-93	-92	-86	0	-80	-81	-85
2003	-83	-95	-62	-95	-93	0	-83	-90	-77
2004	-22	-77	-85	-78	-29	0	-44	-62	-72

Source: Ndlela and Robinson 2007.

Note: — = no data are available.

Table B.22. Annual NRA Estimates for Covered Farm Products, African Focus Countries, 1955–2005
(percent)

Year	Apple	Banana	Bean	Beef	Camel	Cashew	Cassava	Chat	Clove	Cocoa	Coffee
1955	—	—	—	-16	-2	—	0	—	—	-6	—
1956	—	—	—	-11	7	—	0	—	—	-5	-13
1957	—	—	—	-11	14	—	0	—	—	-6	-17
1958	0	—	—	-16	40	—	0	—	—	-32	-4
1959	0	—	—	-10	-32	—	0	—	—	-23	-10
1960	0	—	—	-23	-29	—	0	—	—	-15	-6
1961	-4	-3	-1	-25	-31	—	0	—	—	-16	-37
1962	-4	-1	26	-13	-36	—	0	—	—	-27	-30
1963	-13	-4	0	-16	-48	—	0	—	—	-39	-27
1964	0	-2	-2	-30	-51	—	0	—	—	-36	-37
1965	-5	-4	28	-28	-58	—	0	—	—	-43	-38
1966	1	-4	-2	-31	-65	—	0	—	-57	-47	-38
1967	-22	-3	-10	-21	-66	—	0	—	-54	-55	-31
1968	5	-2	-9	-26	-60	—	0	—	-59	-59	-38
1969	4	-8	0	-37	-59	—	0	—	-8	-64	-38
1970	-2	0	-16	-41	-69	—	0	—	8	-58	-42
1971	-11	0	0	-38	-53	—	0	—	18	-36	-43
1972	33	0	0	-38	1	—	1	—	26	-41	-43
1973	-1	0	0	-49	-28	—	1	—	-69	-50	-42
1974	-9	0	0	-20	-23	—	0	—	-74	-53	-49
1975	-15	1	0	20	5	-88	1	—	-74	-39	-46
1976	-24	0	-45	4	22	-73	1	—	-84	-61	-75
1977	19	0	-46	10	19	-82	1	—	-82	-74	-64
1978	0	-8	-60	11	48	-78	1	—	-85	-68	-69

1979	-18	-1	-41	-26	54	-78	2	—	-78	-60	-56
1980	-11	1	-51	-19	-18	-88	2	—	-85	-50	-57
1981	-36	0	-49	8	48	-88	3	-51	-91	-47	-45
1982	3	-2	-38	11	32	-69	4	-52	-95	-50	-54
1983	-10	-4	-63	13	-2	-77	3	-53	-96	-53	-60
1984	-12	-1	-62	42	-56	-80	0	-53	-93	-61	-51
1985	14	1	-70	-18	-30	-80	2	-51	-79	-59	-55
1986	16	1	-81	28	-57	-93	1	-50	-80	-51	-45
1987	24	-2	-64	41	-84	-91	0	-37	-89	-39	-43
1988	-14	-1	-60	48	-81	-78	0	-46	-91	-26	-40
1989	-6	-3	-54	16	-94	-72	0	-43	-86	-3	-29
1990	6	-2	-49	-17	-75	-58	1	-44	-86	-34	-31
1991	3	-1	-37	-30	-79	-52	0	-45	-82	-31	-29
1992	-5	-1	-29	-50	-85	-47	0	-45	-68	-35	-43
1993	-1	-1	2	-50	-93	-52	0	-45	-45	-43	-49
1994	25	20	-12	-42	-95	-59	-3	-46	-32	-31	-33
1995	-2	9	-15	-5	4	-14	-3	-43	-56	-29	-20
1996	6	6	-10	-6	-48	-6	-3	-45	-61	-34	-19
1997	-3	7	-19	0	67	-16	-3	-44	-74	-31	-24
1998	-1	2	-40	-6	29	-5	-3	-43	31	-34	-20
1999	-21	-1	-39	12	66	-6	-3	-41	24	-34	-20
2000	1	5	-24	-21	76	0	-3	-41	-3	-38	-13
2001	-6	3	-10	-46	56	-2	-2	-43	-55	-33	-7
2002	4	1	-12	-17	66	-19	-3	-47	2	-33	-13
2003	1	-1	-30	-24	62	-7	-3	-26	—	-42	-15
2004	1	-1	-49	-23	178	-21	-3	-41	—	-34	-12
2005	2	—	—	-3	—	—	0	—	—	-58	-20

(Table continues on the following page.)

Table B.22. Annual NRA Estimates for Covered Farm Products, African Focus Countries, 1955–2005 (continued)

Year	Cotton	Fruit & veg.	Grape	Groundnut	Gum arabic	Hides, skin	Maize	Milk	Millet	Oilseed	Orange
1955	-15	—	—	-22	-46	—	-26	-56	-80	—	—
1956	-17	—	—	-28	-41	—	-5	-47	-78	—	—
1957	-18	—	—	-26	-41	—	3	-34	-77	—	—
1958	-18	—	0	-30	1	—	4	-18	-75	—	0
1959	-13	—	0	-37	-39	—	3	-23	-74	—	0
1960	-28	—	0	-43	-43	—	3	-18	-73	—	0
1961	-46	0	-22	-20	-35	—	16	-34	-5	—	-2
1962	-36	0	-28	-18	-13	—	17	-22	-4	—	-2
1963	-44	0	-9	-30	-35	—	9	-18	-7	—	1
1964	-51	0	-17	-26	-41	—	15	-17	-9	—	-19
1965	-56	-1	-24	-33	-30	—	-13	-29	-7	—	-17
1966	-51	-2	-28	-32	-25	—	5	-16	-6	—	-4
1967	-48	-3	-23	-34	-48	—	5	-36	-7	—	-9
1968	-49	-2	-11	-40	-56	—	12	-40	-7	—	-8
1969	-59	-4	-8	-52	-52	—	3	-37	-5	—	-24
1970	-55	-6	-6	-52	-47	—	5	-34	-4	—	-31
1971	-50	-5	-20	-49	-57	—	-1	-42	-8	—	-27
1972	-45	-7	17	-49	-55	—	3	-51	-7	—	-40
1973	-58	-8	15	-54	-57	—	-10	-51	-1	—	-31
1974	-62	-4	5	-52	-76	—	-31	-34	0	—	-15
1975	-54	-1	17	-47	-42	—	-17	-20	-1	—	-21
1976	-46	-3	5	-43	-54	—	-8	5	-1	—	-9
1977	-55	-1	-8	-44	-53	—	-18	20	-2	—	-39
1978	-38	-3	15	-48	-45	—	-12	3	0	—	-11

1979	-53	-4	-29	-47	-43	—	-7	-10	-2	—	-27
1980	-53	-6	-19	-53	-63	—	7	-26	0	—	10
1981	-44	-6	-37	-57	-59	-46	0	-27	7	-52	-24
1982	-33	-7	-36	-18	-52	-47	-3	-51	-2	-48	-21
1983	-41	-5	-32	-57	-69	-47	5	-24	0	-29	-6
1984	-45	-5	-20	-37	-62	-48	-5	21	-2	-44	-17
1985	-51	-1	0	-32	-66	-46	-5	38	0	-45	-29
1986	-27	-2	33	-24	-80	-46	48	37	-6	-39	-7
1987	-16	-5	23	1	-67	-53	85	93	2	-46	-13
1988	-35	-3	13	3	-51	-52	29	95	2	-65	-28
1989	-27	-1	-7	-33	-69	-52	31	69	2	-46	2
1990	-59	0	-6	-39	-49	-52	12	10	1	-49	-4
1991	-53	-3	-4	17	-78	-49	21	-21	4	-55	-5
1992	-64	-9	39	-35	-85	-52	-4	-55	-1	-63	2
1993	-47	-12	-9	-51	-29	-51	2	-58	0	-66	-9
1994	-46	0	-7	-41	-45	-53	10	-10	-2	-52	0
1995	-31	0	3	-41	-36	-50	6	-28	4	-55	-3
1996	-43	-1	0	-41	-70	-52	-4	-32	1	-62	15
1997	-30	-1	10	-29	-50	-51	9	-18	-5	-52	3
1998	-39	-3	13	-34	-70	-47	4	20	-5	-50	-12
1999	-47	0	12	-33	-73	-45	-3	19	-10	-44	6
2000	-46	0	-5	-40	-73	-50	8	36	-3	-46	20
2001	-51	0	44	-43	-67	-50	-11	16	-2	-40	-12
2002	-56	0	2	-40	-56	-49	-3	-1	-3	-32	19
2003	-46	0	-2	-39	-60	-47	-8	25	-2	—	7
2004	-32	0	-2	-40	-80	-46	-13	-2	-1	—	8
2005	-16	—	-1	46	—	—	6	-5	0	—	17

(Table continues on the following page.)

Table B.22. Annual NRA Estimates for Covered Farm Products, African Focus Countries, 1955–2005 (continued)

Year	Other tubers	Palm oil	Pepper	Plantain	Potato	Poultry	Pulse	Pyrethrum	Rice	Sesame	Sheep meat
1955	—	—	—	0	—	—	—	—	-68	-37	-6
1956	—	—	—	0	—	—	—	—	-65	-31	1
1957	—	—	—	0	—	—	—	—	-62	-30	-14
1958	—	—	—	0	—	—	—	—	-58	-54	-25
1959	—	—	—	0	—	—	—	—	-56	-49	-17
1960	—	—	—	0	—	-13	—	—	-54	-46	-22
1961	0	-18	—	0	—	-13	—	—	-31	-51	-21
1962	0	-13	—	0	—	-13	—	—	-31	-57	-5
1963	0	-35	—	0	—	-13	—	—	-37	-56	-12
1964	0	-34	—	0	—	-13	—	—	-38	-53	-11
1965	0	-43	—	0	—	-13	—	—	-37	-55	-16
1966	0	-34	-62	0	—	-13	—	—	-34	-59	-18
1967	0	-42	-48	0	—	-13	—	—	-35	-65	-18
1968	0	-10	-41	0	—	-13	—	—	-47	-69	-19
1969	0	-26	16	0	—	-13	—	—	-41	-70	-19
1970	0	-57	-9	0	—	-31	—	—	-11	-60	-28
1971	0	-51	-19	0	—	-15	—	—	5	-67	-6
1972	0	-25	6	0	—	-16	—	—	-2	-64	-11
1973	0	-47	6	0	—	-10	—	—	-39	-64	-27
1974	0	-42	-5	0	—	-7	—	—	-64	-72	-37
1975	0	-8	-24	0	—	-21	—	—	-40	-67	-13
1976	0	20	-47	0	0	-34	—	-87	-18	-63	-3
1977	0	-58	-35	0	0	-29	—	-92	12	-68	-35
1978	0	-27	-57	0	0	-22	—	-76	-14	-68	-25
1979	0	-13	-34	0	0	-12	—	-74	-10	-73	-30

1980	0	1	-19	0	0	20	—	-80	-17	-64	-17
1981	0	1	-38	0	0	23	-35	-69	-27	-59	-7
1982	0	-4	-57	0	0	6	-34	-62	-16	-59	-26
1983	0	-62	-54	0	0	31	-36	-70	-20	-51	-17
1984	0	-63	-65	0	0	12	-25	-77	11	-64	-34
1985	0	-43	-73	0	0	-21	-54	-71	21	-29	-46
1986	0	-19	-77	0	0	-13	-58	-85	11	-63	-31
1987	0	-27	-88	0	0	9	-55	-77	28	-57	-40
1988	0	80	-83	0	0	18	-57	-80	45	-39	-27
1989	0	-50	-78	0	0	-7	-57	-55	38	-54	-42
1990	0	-49	-71	0	0	-3	-44	-17	3	-58	-45
1991	0	95	-27	0	0	-4	-44	-17	16	-2	-40
1992	0	97	-16	0	0	5	-62	-25	-4	-61	-48
1993	0	-10	-22	0	0	20	-56	-52	-3	-66	-54
1994	0	405	-15	0	0	14	-54	-74	-9	-54	-56
1995	0	191	-50	0	0	15	-36	-68	-16	-30	-60
1996	0	27	-49	0	0	20	-43	-67	-13	-63	-62
1997	0	7	-78	0	0	21	-36	-71	-8	-59	-35
1998	0	3	-70	0	0	4	-32	-72	-5	-47	-42
1999	0	-22	-63	0	0	5	-29	-61	1	-50	-27
2000	0	-24	20	0	0	-2	-31	-49	-11	-55	-23
2001	0	-17	6	0	0	-15	-17	-43	-1	-53	-38
2002	0	-13	-56	0	0	-10	-14	-41	-13	-53	-37
2003	0	-9	—	0	0	20	—	-48	3	-32	-27
2004	0	0	—	0	0	20	—	-57	-5	2	18
2005	—	—	—	0	—	22	—	—	-12	—	6

(Table continues on the following page.)

Table B.22. Annual NRA Estimates for Covered Farm Products, African Focus Countries, 1955–2005 (continued)

Year	Sisal	Sorghum	Soybean	Sugar	Sunflower	Tea	Teff	Tobacco	Vanilla	Wheat	Yam
1955	—	-35	—	-29	—	—	—	—	—	-16	0
1956	—	-20	—	-25	—	—	—	—	—	-16	0
1957	—	-40	—	-23	—	2	—	—	—	-11	0
1958	—	-34	—	-18	—	2	—	—	—	-13	0
1959	—	-47	—	-14	—	6	—	—	—	-8	0
1960	—	-51	—	-24	0	6	—	-56	-66	-15	0
1961	—	100	—	13	9	13	—	-38	-62	-24	0
1962	—	109	—	15	23	16	—	-32	-61	-35	0
1963	—	72	—	-17	24	7	—	-37	-66	-32	0
1964	—	78	—	-16	19	6	—	-45	-53	-31	0
1965	—	89	—	-23	12	3	—	-31	-55	-24	0
1966	—	107	—	7	10	-2	—	-21	-42	-23	0
1967	—	88	—	30	22	-6	—	-40	-57	-6	0
1968	—	72	0	27	19	-15	—	-45	-52	-4	0
1969	—	77	-29	16	22	-13	—	-52	-57	-5	0
1970	—	41	-43	0	13	-15	—	-58	-43	3	0
1971	—	44	-40	-18	8	-14	—	-55	-35	-6	0
1972	—	52	-41	-27	14	-24	—	-48	-34	19	0
1973	—	61	-15	-19	6	-25	—	-39	-37	-15	0
1974	—	47	-10	-57	-10	-22	—	-24	-46	-33	0
1975	—	29	-37	-51	0	-15	—	-55	-46	-13	1
1976	—	47	-51	-27	7	-48	—	-62	-68	0	1
1977	—	26	-59	8	8	-30	—	-56	-47	29	0
1978	—	36	-25	5	14	-28	—	-49	-75	32	0
1979	-39	5	-43	8	5	-31	—	-50	-49	13	1
1980	-37	7	-54	-41	25	-37	—	-55	-57	-14	2

1981	-20	39	-56	-35	20	-32	-2	-24	-67	-10	2
1982	-31	9	-23	4	15	-42	-4	-43	-87	0	2
1983	-55	-4	-56	38	19	-41	-2	-65	-86	2	1
1984	-60	32	-26	29	1	-15	-11	-49	-85	-3	0
1985	-49	56	-28	25	-2	-18	-10	-46	-83	-11	1
1986	-27	-3	-27	36	14	-15	-7	-50	-81	13	0
1987	-49	72	-38	78	18	-28	-9	-58	-91	38	0
1988	-25	44	-55	45	2	-46	-6	-34	-87	28	0
1989	5	37	-54	27	2	-38	-6	-51	-85	28	0
1990	-4	52	-46	-9	7	-30	-9	-29	-84	5	0
1991	-12	83	-65	-1	17	-34	-11	-34	-89	17	0
1992	-23	20	-58	-5	12	-67	-9	-53	-73	-5	0
1993	9	-1	-52	5	1	-43	-6	-43	-73	0	0
1994	-36	32	-44	18	-5	-28	-7	-31	-71	3	-3
1995	-3	21	-35	1	-5	-33	-5	-25	-69	-5	-4
1996	0	0	-41	-9	-6	-33	-1	-22	-49	-4	-4
1997	0	31	-56	11	-8	-35	-5	-40	9	7	-4
1998	0	24	-64	1	-14	-25	-4	-42	-5	4	-3
1999	0	38	-55	30	1	-14	-8	-42	-29	4	-3
2000	0	64	-43	51	-1	-19	-9	-57	-9	4	-3
2001	0	21	-75	35	-14	-9	-2	-60	6	1	-3
2002	0	9	-67	27	-7	-20	-8	-74	-35	-11	-3
2003	0	5	-38	54	0	-17	-12	-77	—	-2	-3
2004	0	4	-49	51	4	-17	-5	-48	—	2	-3
2005	—	0	4	12	1	—	—	—	—	7	0

Source: Anderson and Valenzuela 2008, based on estimates in chapters 2–18 of this book.

Note: — = no data are available.

Table B.23. Annual NRAs for Exportable, Import-Competing, and All Covered Farm Products, for Nonagricultural Tradables, and for the RRAs, 16 African Focus Countries, 1955–2005*(percent)*

Year	NRA, total agricultural products ^a				NRA, agricultural tradables ^b			NRA, nonagricultural tradables	RRA
	Covered products		Noncovered products	All products	Exportables	Import- competing	All		
	Inputs	Outputs							
1955	0	-22	1	-17	-21	-31	-30	17	-41
1956	0	-18	1	-13	-17	-26	-25	17	-35
1957	0	-16	0	-13	-17	-22	-23	20	-36
1958	0	-17	1	-13	-25	-12	-22	23	-37
1959	0	-15	1	-13	-23	-11	-20	23	-35
1960	0	-23	1	-18	-32	-15	-30	22	-42
1961	0	-8	5	-4	-27	25	-7	-2	-6
1962	0	-4	6	-1	-25	42	-2	-2	0
1963	0	-11	3	-7	-32	23	-13	1	-13
1964	0	-14	4	-9	-35	18	-15	-3	-13
1965	0	-18	3	-12	-40	10	-22	1	-22
1966	0	-13	5	-8	-35	23	-14	-5	-10
1967	0	-15	1	-10	-33	12	-16	6	-21
1968	0	-17	2	-11	-37	10	-19	4	-22
1969	0	-23	0	-16	-46	5	-26	5	-30
1970	0	-20	-3	-15	-43	7	-25	6	-29
1971	0	-16	0	-11	-40	9	-20	1	-21
1972	0	-16	3	-10	-34	6	-18	0	-18
1973	0	-24	0	-17	-45	-6	-28	0	-28
1974	0	-29	0	-21	-50	-5	-33	-2	-32
1975	0	-19	2	-12	-41	12	-21	-3	-18
1976	0	-20	2	-12	-44	24	-21	-5	-17
1977	0	-20	-2	-15	-47	25	-25	11	-32
1978	0	-16	-3	-11	-43	19	-21	12	-29

1979	0	-20	0	-13	-38	-4	-23	9	-29
1980	1	-18	2	-11	-36	-2	-18	3	-21
1981	1	-10	1	-5	-28	8	-10	-10	0
1982	1	-9	2	-4	-29	18	-7	-15	10
1983	0	-11	-13	-11	-41	13	-19	17	-30
1984	0	-7	-9	-9	-42	29	-13	9	-21
1985	0	-12	-14	-12	-48	26	-21	12	-29
1986	0	1	-11	-3	-40	61	-5	12	-15
1987	0	13	-2	8	-31	98	17	1	15
1988	0	9	-6	4	-30	65	9	12	-2
1989	0	2	-5	-1	-35	47	0	7	-6
1990	0	-8	-6	-8	-36	12	-13	8	-19
1991	0	-3	-3	-4	-29	24	-5	1	-6
1992	0	-17	-7	-12	-42	-12	-23	6	-27
1993	0	-19	-7	-15	-41	-15	-27	4	-29
1994	0	-7	-1	-6	-31	18	-9	-8	-1
1995	0	-4	-4	-5	-27	10	-8	0	-8
1996	0	-10	-7	-10	-32	0	-17	3	-19
1997	0	-2	-6	-5	-27	17	-7	0	-7
1998	0	-3	-4	-5	-25	13	-8	0	-7
1999	0	0	-5	-4	-19	10	-5	5	-9
2000	0	-2	-7	-5	-19	4	-8	9	-15
2001	0	-10	-5	-9	-36	6	-17	3	-19
2002	0	-7	-5	-8	-22	-6	-13	6	-18
2003	0	-5	-5	-7	-25	4	-11	8	-18
2004	0	-5	-5	-6	-21	-1	-11	6	-16
2005	0	-1	-2	-2	-11	7	-2	14	-14

Source: Anderson and Valenzuela 2008, based on estimates in chapters 2–17 of this book.

- a. The NRAs include assistance to nontradables and non-product-specific assistance.
- b. The NRAs include product-specific input subsidies.

Table B.24. Annual Value Shares of Agricultural Production for Farm Products, African Focus Countries, 1955–2005*(percent)*

Year	Bean	Beef	Camel	Cassava	Cocoa	Coffee	Cotton	Groundnut	Maize
1955	—	9	1	1	5	—	15	1	5
1956	—	9	1	1	5	1	15	1	6
1957	—	8	1	1	4	1	18	1	5
1958	—	8	1	1	6	1	15	1	5
1959	—	8	1	1	6	1	17	1	5
1960	—	8	1	1	5	1	17	1	4
1961	0	6	0	6	4	3	8	4	7
1962	0	5	0	7	4	2	8	4	7
1963	0	5	0	6	4	3	8	4	7
1964	0	6	0	6	5	4	7	4	6
1965	0	6	1	5	3	3	9	5	8
1966	0	7	1	8	3	4	7	4	7
1967	0	7	1	5	4	3	7	4	9
1968	0	7	1	4	4	4	7	3	7
1969	0	7	1	3	5	3	10	3	7
1970	0	7	1	4	5	4	8	3	6
1971	0	7	1	6	4	3	7	3	8
1972	0	8	0	5	3	4	7	3	7
1973	0	9	0	4	4	4	7	3	6
1974	0	5	0	3	3	2	7	4	9
1975	0	4	0	5	3	3	6	4	9
1976	0	5	0	6	4	8	6	3	7
1977	1	4	0	7	6	8	7	2	7
1978	1	5	0	8	5	6	5	3	6
1979	1	7	0	7	6	5	5	3	5
1980	1	7	0	7	4	4	5	3	7
1981	0	5	0	12	3	3	3	3	8
1982	0	5	0	10	2	4	3	1	8
1983	1	7	0	5	2	4	4	2	8
1984	1	5	1	8	4	3	4	2	8
1985	1	6	0	7	3	4	4	1	11
1986	0	7	1	7	3	5	4	2	7
1987	0	7	2	10	3	3	4	1	6
1988	0	7	2	8	3	3	5	1	9
1989	0	8	5	6	2	2	4	2	8
1990	0	6	1	8	2	2	4	2	9
1991	0	7	1	11	2	1	4	1	7
1992	0	8	0	10	2	1	5	1	7

Year	Bean	Beef	Camel	Cassava	Cocoa	Coffee	Cotton	Groundnut	Maize
1993	0	9	2	9	2	1	3	2	8
1994	0	8	1	9	2	3	2	1	9
1995	1	4	0	9	2	2	2	2	8
1996	0	4	0	9	3	2	3	2	8
1997	1	4	0	11	2	2	3	2	8
1998	1	4	0	11	3	2	2	2	8
1999	1	4	0	10	2	1	2	2	10
2000	1	6	0	10	2	1	2	2	8
2001	1	9	0	11	3	1	3	2	7
2002	0	5	0	10	3	1	2	2	8
2003	1	7	0	9	3	1	2	2	10
2004	1	7	0	9	3	1	2	2	10
2005	—	8	—	2	4	1	3	0	13

(Table continues on the following page.)

Table B.24. Annual Value Shares of Agricultural Production for Farm Products, African Focus Countries, 1955–2005 (continued)

Year	Milk	Millet	Orange	Other tubers	Palm oil	Plantain	Poultry	Pulse	Rice
1955	7	1	—	—	—	1	—	—	4
1956	7	1	—	—	—	1	—	—	4
1957	6	1	—	—	—	1	—	—	4
1958	6	1	0	—	—	1	—	—	4
1959	7	1	0	—	—	1	—	—	4
1960	6	1	0	—	—	1	1	—	3
1961	3	4	0	1	1	2	0	—	2
1962	2	4	0	1	1	2	0	—	3
1963	2	4	0	2	1	2	0	—	3
1964	2	3	0	1	1	2	0	—	3
1965	3	4	0	1	1	2	1	—	3
1966	2	3	0	1	1	2	1	—	3
1967	3	4	0	1	1	2	1	—	4
1968	3	4	0	2	1	2	1	—	6
1969	2	3	1	1	1	2	1	—	4
1970	2	4	1	1	1	2	1	—	2
1971	2	4	0	1	1	2	1	—	2
1972	3	4	1	1	0	2	1	—	2
1973	3	4	0	1	0	2	2	—	4
1974	2	3	0	1	1	1	1	—	6
1975	2	3	0	1	1	2	1	—	5
1976	2	3	0	1	0	2	1	—	4
1977	2	2	0	1	1	2	1	—	2
1978	2	2	0	0	1	2	1	—	3
1979	2	3	0	0	1	2	1	—	3
1980	2	2	0	0	1	2	1	—	3
1981	2	2	0	0	1	1	1	0	3
1982	3	3	0	0	0	1	1	1	3
1983	3	2	0	0	0	2	1	1	3
1984	2	2	0	0	1	2	1	1	2
1985	2	2	0	0	1	1	1	0	2
1986	2	3	0	0	0	1	1	1	3
1987	2	3	0	0	1	1	2	0	3
1988	2	2	0	0	0	2	2	0	2
1989	2	2	0	0	0	2	1	0	3
1990	2	2	0	0	0	2	2	1	3

Year	Milk	Millet	Orange	Other tubers	Palm oil	Plantain	Poultry	Pulse	Rice
1991	2	2	0	0	0	1	2	1	2
1992	2	2	0	0	0	2	2	0	3
1993	3	2	0	0	1	2	2	0	3
1994	3	2	0	0	0	3	2	0	3
1995	3	2	0	0	0	4	2	0	3
1996	3	2	0	0	1	2	2	0	3
1997	3	2	0	0	1	2	1	0	3
1998	3	3	0	0	1	2	1	0	3
1999	3	2	0	0	1	2	1	0	3
2000	3	2	0	0	1	3	2	0	3
2001	3	2	0	0	1	2	2	0	3
2002	4	2	0	0	1	2	2	0	3
2003	3	2	0	0	1	2	2	—	3
2004	4	2	0	0	1	2	2	—	3
2005	2	1	1	—	—	1	4	—	5

(Table continues on the following page.)

Table B.24. Annual Value Shares of Agricultural Production for Farm Products, African Focus Countries, 1955–2005 (continued)

Year	Sesame	Sheep meat	Sorghum	Sugar	Tea	Teff	Tobacco	Wheat	Yam
1955	1	1	2	1	—	—	—	4	5
1956	1	1	1	1	—	—	—	5	4
1957	1	4	3	1	0	—	—	5	4
1958	1	5	3	1	0	—	—	4	4
1959	1	4	3	1	0	—	—	4	4
1960	1	4	2	1	0	—	5	4	3
1961	0	2	4	2	0	—	2	2	7
1962	1	2	5	2	0	—	2	2	7
1963	0	2	4	2	0	—	2	2	7
1964	0	2	4	2	0	—	2	2	7
1965	0	2	4	2	0	—	1	2	5
1966	0	2	3	2	0	—	1	2	7
1967	0	2	3	1	0	—	1	2	5
1968	0	2	3	1	0	—	1	2	5
1969	0	2	3	2	0	—	1	2	5
1970	0	2	4	1	0	—	1	2	6
1971	1	2	4	2	0	—	1	2	8
1972	1	2	3	2	0	—	1	2	6
1973	1	2	3	2	0	—	1	2	6
1974	1	2	4	4	0	—	0	3	8
1975	1	2	3	4	0	—	1	2	7
1976	1	1	3	2	0	—	1	2	6
1977	0	2	3	2	1	—	0	1	6
1978	1	2	3	2	1	—	1	1	7
1979	1	2	3	2	1	—	1	2	7
1980	1	2	3	3	1	—	1	2	7
1981	0	2	3	2	0	0	0	4	7
1982	0	2	4	2	1	1	1	5	7
1983	0	2	3	1	1	0	1	6	4
1984	0	2	3	1	1	1	1	4	6
1985	0	2	2	1	1	1	1	4	5
1986	0	1	3	1	1	0	1	5	4
1987	0	2	3	1	1	0	1	4	5
1988	0	2	2	2	1	0	1	4	5
1989	0	2	2	2	1	0	1	5	5
1990	0	2	2	2	1	0	1	3	6
1991	0	1	2	2	1	1	1	5	8
1992	0	1	3	1	1	0	1	4	8

Year	Sesame	Sheep meat	Sorghum	Sugar	Tea	Teff	Tobacco	Wheat	Yam
1993	0	2	3	1	1	0	1	4	7
1994	0	2	2	1	1	0	1	4	8
1995	0	2	2	1	1	0	1	4	9
1996	0	1	3	2	1	0	1	4	7
1997	0	1	2	1	1	0	1	4	8
1998	0	1	3	2	1	0	1	5	8
1999	0	1	2	1	1	1	1	5	8
2000	0	1	2	1	1	1	1	4	8
2001	0	2	2	1	1	0	1	5	7
2002	0	2	3	1	1	0	1	6	7
2003	0	2	3	1	1	0	1	5	7
2004	0	2	3	1	1	0	0	5	7
2005	—	1	2	2	—	—	—	11	2

Source: Anderson and Valenzuela 2008, based on estimates in chapters 2–18 of this book.

Note: — = no data are available. Value shares are given in undistorted farmgate prices. Columns for apple, banana, cashew, *chat*, clove, fruits and vegetables, grape, gum arabic, hides and skins, oilseed, pepper, potato, pyrethrum, sisal, and soybean are omitted because their annual shares of the gross value of regional production are each less than 0.5 percent.

Table B.25. Gross Subsidy Equivalents of Assistance to Farmers, African Focus Countries, 1955–2004
(constant 2000 US\$ millions)

Year	Benin	Burkina Faso	Cameroon	Chad	Côte d'Ivoire	Egypt, Arab Rep. of	Ethiopia	Ghana	Kenya	Madagascar	Mali
	BJ	BF	CM	TD	CI	EG	ET	GH	KE	MG	ML
1955	—	—	—	—	—	-1,748	—	-33	—	2	—
1956	—	—	—	—	—	-1,673	—	-16	119	2	—
1957	—	—	—	—	—	-1,602	—	-36	142	2	—
1958	—	—	—	—	—	-1,442	—	-239	168	2	—
1959	—	—	—	—	—	-1,337	—	-190	121	2	—
1960	—	—	—	—	—	-1,831	—	-130	142	-12	—
1961	—	—	-81	—	-388	-2,364	—	16	29	-116	—
1962	—	—	-74	—	-253	-2,268	—	-174	157	-68	—
1963	—	—	-102	—	-376	-2,757	—	-284	255	-100	—
1964	—	—	-76	—	-606	-3,142	—	-369	227	-123	—
1965	—	—	-101	—	-424	-3,821	—	-231	-41	-111	—
1966	—	—	-126	—	-638	-3,205	—	-312	-64	-201	—
1967	—	—	-164	—	-470	-2,431	—	-393	180	-146	—
1968	—	—	-203	—	-726	-3,250	—	-360	189	-309	—
1969	—	—	-278	—	-755	-4,035	—	-455	112	-157	—
1970	-3	-1	-238	-8	-735	-2,937	—	-341	-94	-14	-6
1971	-6	-3	-179	-14	-562	-3,065	—	-70	-246	-13	-10
1972	-7	-4	-183	-15	-632	-2,902	—	-204	-32	-18	-11
1973	-20	-11	-309	-50	-800	-4,773	—	-427	-110	-515	-24
1974	-5	-4	-406	-15	-982	-7,087	—	-626	-188	-1,229	-10
1975	-5	-9	-172	-30	-516	-4,085	—	-480	65	-405	-25
1976	-6	-18	-469	-44	-3,819	-1,926	—	-679	193	-621	-46
1977	-2	-4	-1,110	-15	-2,792	-558	—	-874	-858	-633	-17

1978	-4	-10	-793	-23	-2,026	-444	—	-730	-436	-756	-28
1979	-5	-12	-636	-14	-1,962	-3,216	—	-874	252	-362	-24
1980	-3	-12	-342	-14	-1,735	-2,979	—	-499	-634	-553	-23
1981	-1	-7	-183	-8	-1,864	-3,432	-1,509	-611	-382	-706	-13
1982	-4	-12	-224	-14	-1,147	-1,936	-1,917	-493	-666	-566	-23
1983	-8	-17	-208	-30	-1,639	902	-1,985	—	-266	-516	-30
1984	-9	-11	-414	-8	-1,291	1,426	-2,039	-13	-91	-554	-19
1985	2	1	-192	2	-1,690	-941	-3,524	-204	183	-213	-1
1986	1	0	-184	2	-1,215	4,212	-2,203	-217	248	-230	-5
1987	-3	-6	26	-1	-1,082	7,063	-1,969	1	309	-315	-10
1988	-2	-4	67	1	-774	7,758	-2,277	-3	-179	-244	-9
1989	-12	-16	45	-12	-473	8,648	-1,986	-31	281	-195	-32
1990	-11	-14	-42	-8	-852	-1,073	-2,360	-41	31	-101	-23
1991	-5	-4	-34	-2	-652	511	-2,920	44	-117	-110	-8
1992	4	2	-3	3	-669	-1,388	-2,270	3	130	-80	9
1993	-9	-3	-42	-3	-709	-674	-1,380	-37	-441	-94	-8
1994	-43	-32	-45	-25	-879	-287	-2,008	-107	11	20	-60
1995	-33	-17	-10	-16	-844	-117	-2,080	-94	-35	-103	-46
1996	-22	-17	4	-14	-955	-728	-1,785	-121	-16	-42	-43
1997	-25	-26	-47	-12	-909	679	-2,301	-64	81	-60	-43
1998	2	-5	-93	0	-942	954	-2,039	-63	-63	9	-7
1999	-4	-2	-46	1	-737	980	-2,276	-47	210	3	-14
2000	-12	-11	6	-6	-643	338	-1,513	-105	88	30	-11
2001	3	6	5	0	-700	-523	-699	41	237	-16	8
2002	-7	-7	-29	-3	-1,025	-1,426	-1,227	27	92	-37	-5
2003	-10	-16	-21	-4	-1,048	-437	-1,183	-112	133	-1	-10
2004	7	27	19	8	-1,139	-808	-945	-22	153	75	27

(Table continues on the following page.)

Table B.25. Gross Subsidy Equivalents of Assistance to Farmers, African Focus Countries, 1955–2004 (continued)

	Mozambique	Nigeria	South Africa	Senegal	Sudan	Tanzania	Togo	Uganda	Zambia	Zimbabwe
	MZ	NG	ZA	SN	SD	TZ	TG	UG	ZM	ZW
1955	—	—	—	—	-347	—	—	—	—	40
1956	—	—	—	—	-260	—	—	—	—	39
1957	—	—	—	—	-298	—	—	—	—	58
1958	—	—	—	—	-338	—	—	—	—	26
1959	—	—	—	—	-478	—	—	—	—	30
1960	—	—	—	—	-545	—	—	—	—	-478
1961	—	2,272	96	-96	-509	—	—	-12	—	-298
1962	—	2,827	441	-70	-594	—	—	-5	—	-211
1963	—	1,647	177	-76	-712	—	—	-45	—	-326
1964	—	2,029	29	-61	-1,070	—	—	-83	—	-420
1965	—	1,417	119	-60	-996	—	—	-34	-21	-564
1966	—	2,298	406	-55	-1,064	—	—	-47	-74	-206
1967	—	605	596	-45	-1,313	—	—	-81	-34	-277
1968	—	1,057	748	-22	-1,250	—	—	-62	-103	-204
1969	—	502	630	-88	-1,374	—	—	-96	-514	-275
1970	—	-298	181	-77	-1,910	—	0	-116	54	-267
1971	—	907	332	-105	-1,945	—	-1	-107	-182	-373
1972	—	1,332	540	-111	-2,019	—	-1	-140	-122	-481
1973	—	1,162	-205	-265	-2,901	—	-3	-185	-150	-441
1974	—	1,234	-2,349	-612	-3,960	—	-1	-445	-161	-811
1975	—	2,116	-676	-593	-2,545	—	-2	-462	-407	-809
1976	-299	2,915	-68	-327	-1,588	-1,085	-3	—	-192	-1,083
1977	-301	-776	873	-126	-1,875	-1,529	-1	—	-790	-794
1978	-367	-330	935	-419	-1,269	-1,601	-3	—	-451	-613

1979	-154	1,004	587	-421	-2,027	-1,886	-4	—	-101	-594
1980	-344	2,281	1,520	-289	-2,653	-1,477	-5	—	-198	-762
1981	-247	5,179	2,797	-612	-1,967	-1,066	-3	22	91	-748
1982	-161	5,293	2,749	-26	-2,981	-651	-6	-133	70	-377
1983	-137	-1,615	2,302	-61	-2,536	-986	-7	-260	18	-524
1984	-101	-147	966	-113	-1,728	-1,130	-9	-206	-134	-598
1985	-106	474	-208	-70	-1,548	-567	0	-165	-203	-534
1986	-131	770	912	46	-2,580	-792	-1	-149	-216	-480
1987	-148	3,733	2,196	172	-2,874	-645	-4	-134	-377	-384
1988	-124	1,278	956	87	-1,882	-697	-4	-43	-733	-574
1989	-91	753	406	-13	-6,035	-623	-10	-61	-451	-691
1990	-28	456	788	45	-1,481	-630	-8	10	-422	-512
1991	-20	2,825	866	34	-1,826	-458	-2	-41	-259	-806
1992	-17	-488	401	97	-4,395	-278	1	-11	-4	-490
1993	-13	-1,285	578	83	-5,904	-95	-3	-4	-82	-614
1994	-22	2,464	1,569	-71	-4,561	-148	-24	-16	-123	-257
1995	13	858	979	-35	-2,351	-566	-11	-4	-22	-272
1996	41	-1,622	759	-16	-3,375	-294	-12	1	-352	-396
1997	48	158	1,020	-38	-1,928	-393	-11	35	-140	-470
1998	72	615	-371	-5	-1,423	-739	-2	34	-272	-393
1999	82	474	-108	-63	-161	-889	0	23	-201	-805
2000	52	-1,118	309	-111	-412	-437	-4	14	-237	-504
2001	45	-539	-406	-74	-2,923	-396	1	14	-127	-1,432
2002	58	-959	-283	-16	-653	-170	-4	13	-128	-782
2003	71	-1,612	293	3	-1,236	-155	-8	13	-96	-562
2004	49	-942	156	-13	-825	-492	1	16	-205	-975

Source: Anderson and Valenzuela 2008, based on estimates in chapters 2–18 of this book.

Note: — = no data are available.

Table B.26. Share of the Regional Value of Agricultural Production, 16 African Focus Countries, 1955–2004a. Annual average
(percent)

Year	CM	CI	EG	ET	GH	KE	MG	MZ	NG	ZA	SN	SD	TZ	UG	ZM	ZW	CC ^a
1955	—	—	50	—	17	—	9	—	—	2	—	21	—	—	—	1	—
1956	—	—	47	—	17	4	8	—	—	2	—	21	—	—	—	1	—
1957	—	—	47	—	14	4	7	—	—	4	—	22	—	—	—	1	—
1958	—	—	49	—	17	4	7	—	—	4	—	19	—	—	—	1	—
1959	—	—	48	—	16	3	7	—	—	4	—	21	—	—	—	1	—
1960	—	—	45	—	15	3	6	—	—	5	—	20	—	—	—	6	—
1961	7	4	18	—	6	2	4	—	27	13	2	8	—	5	1	2	—
1962	8	4	18	—	5	2	4	—	29	12	2	10	—	5	1	2	—
1963	8	4	19	—	5	2	4	—	27	13	2	9	—	5	1	2	—
1964	7	5	20	—	5	2	4	—	27	12	2	8	—	5	1	2	—
1965	7	4	23	—	4	3	4	—	23	11	2	9	—	6	1	3	—
1966	7	5	20	—	4	3	4	—	27	12	2	9	—	5	1	2	—
1967	7	5	20	—	5	2	4	—	23	16	2	9	—	5	1	2	—
1968	8	6	22	—	4	2	5	—	22	13	2	10	—	5	1	2	—
1969	7	5	23	—	5	2	4	—	22	13	1	9	—	6	2	2	—
1970	7	5	17	—	4	2	3	—	24	13	1	10	—	6	1	1	6
1971	6	4	16	—	4	2	3	—	24	14	1	10	—	7	1	2	5
1972	7	5	18	—	4	2	3	—	20	14	1	11	—	5	1	2	5
1973	7	5	20	—	4	2	4	—	22	14	2	11	—	4	1	2	5
1974	5	4	22	—	3	2	4	—	24	16	2	9	—	3	1	2	3
1975	5	5	20	—	4	2	3	0	22	15	3	10	—	4	1	2	4
1976	5	10	17	—	3	2	2	1	21	11	2	9	4	4	1	2	4
1977	6	9	13	—	3	5	3	1	20	10	1	9	4	7	1	2	6

1978	5	8	13	—	4	3	2	1	24	10	2	9	4	7	1	2	5
1979	5	10	14	—	3	2	2	1	18	13	2	10	5	6	1	2	7
1980	5	7	15	—	4	3	2	2	18	14	1	10	3	7	1	2	6
1981	3	5	12	10	2	2	2	1	28	12	2	10	2	2	1	2	4
1982	3	5	14	13	2	3	1	1	25	10	1	10	2	3	0	2	5
1983	3	7	14	17	—	2	2	1	20	10	1	11	2	4	1	1	5
1984	3	6	13	14	3	3	2	0	25	10	1	9	2	3	1	2	4
1985	2	6	12	20	2	2	2	0	25	8	1	8	2	2	0	2	4
1986	4	6	14	16	2	3	2	0	22	9	1	9	2	2	1	2	5
1987	3	6	12	12	3	2	2	1	26	10	1	11	2	2	0	2	6
1988	4	6	13	13	2	3	2	1	21	11	1	10	2	3	1	2	6
1989	3	4	13	12	2	2	2	1	22	10	1	16	2	3	1	2	5
1990	4	5	13	13	2	2	2	1	26	10	1	9	2	3	0	2	6
1991	3	4	12	14	3	2	2	1	25	10	1	9	1	2	0	2	7
1992	4	5	12	11	3	2	2	1	26	10	1	8	2	3	0	1	8
1993	4	5	13	8	3	2	2	1	22	11	1	12	2	4	1	2	7
1994	5	6	11	12	2	3	2	1	23	10	1	11	2	5	1	1	5
1995	4	5	11	12	3	2	2	1	28	8	1	8	3	6	0	1	5
1996	4	5	13	10	2	2	1	1	29	9	0	8	2	3	1	2	6
1997	3	5	11	13	3	2	1	1	29	8	1	8	3	4	0	2	5
1998	3	5	10	14	4	2	2	1	27	8	0	8	3	4	1	1	6
1999	3	4	11	15	3	2	2	2	28	8	1	7	3	4	1	2	5
2000	3	5	12	12	3	2	2	1	27	8	1	10	3	5	1	2	5
2001	4	4	12	10	3	2	2	1	23	8	1	14	3	5	0	3	6
2002	4	5	11	13	3	2	2	1	24	8	0	10	3	4	1	2	7
2003	3	4	10	14	4	2	1	1	22	9	1	12	3	5	1	1	7
2004	3	4	12	13	4	2	1	0	21	10	1	12	3	5	1	2	6

(Table continues on the following page.)

Table B.26. Share of the Regional Value of Agricultural Production, 16 African Focus Countries, 1955–2004 (continued)

b. Five-year averages
(percent)

	CM	CI	EG	ET	GH	KE	MG	MZ	NG	ZA	SN	SD	TZ	UG	ZM	ZW	CC ^a
1955–59	—	—	48	—	16	4	8	—	—	3	—	21	—	—	—	1	—
1960–64	7	4	24	—	7	2	4	—	27	11	2	11	—	5	1	2	—
1965–69	7	5	22	—	4	2	4	—	23	13	2	9	—	5	1	2	—
1970–74	6	5	19	—	4	2	3	—	23	14	1	10	—	5	1	2	5
1975–79	5	8	15	—	3	3	3	1	21	12	2	9	4	6	1	2	5
1980–84	3	6	13	14	3	3	2	1	23	11	1	10	2	4	1	2	5
1985–89	3	6	13	15	2	2	2	1	23	10	1	11	2	2	1	2	5
1990–94	4	5	12	12	3	2	2	1	25	10	1	10	2	3	1	2	7
1995–99	3	5	11	13	3	2	2	1	28	8	1	8	3	4	1	2	6
2000–04	3	5	11	12	3	2	2	1	23	9	1	12	3	5	1	2	6

Source: Anderson and Valenzuela 2008, based on estimates in chapters 2–18 of this book.

Note: — = no data are available. See table B.27 for a definition of the country codes. The value of production is given at undistorted prices.

a. The cotton countries are Benin, Burkina Faso, Chad, Mali, and Togo.

Table B.27. Summary of NRA Data for 21 African Focus Countries

Country	ISO code	Maximum number of years	Maximum number of products	Number of NRA observations	2000–04		
					NRA, weighted average ^a	NRA, standard deviation ^a	Gross value of production ^b
Benin	BJ	36	5	180	-0.5	7.2	1.1
Burkina Faso	BF	36	5	180	-0.1	10.4	1.2
Cameroon	CM	45	10	432	-0.1	7.5	2.9
Chad	TD	36	5	180	-0.1	10.3	0.7
Côte d'Ivoire	CI	45	7	310	-24.5	33.1	3.8
Egypt, Arab Rep. of	EG	51	7	357	-6.1	22.1	9.8
Ethiopia	ET	25	8	192	-11.2	23.6	10.5
Ghana	GH	49	7	343	-1.4	25.5	2.9
Kenya	KE	49	7	324	9.3	25.6	1.6
Madagascar	MG	51	10	413	1.0	22.5	1.3
Mali	ML	36	5	180	0.1	9.9	1.7
Mozambique	MZ	31	14	378	12.4	37.9	0.9
Nigeria	NG	44	10	440	-5.4	53.2	19.8
South Africa	ZA	51	14	618	-0.1	20.3	7.4
Senegal	SN	45	4	169	-7.5	18.6	0.5
Sudan	SD	50	12	594	-11.9	63.2	10.0
Tanzania	TZ	29	18	517	-12.4	51.9	2.7
Togo	TG	36	5	172	-0.7	7.7	0.4
Uganda	UG	44	13	572	0.4	6.9	4.0
Zambia	ZM	45	10	394	-29.6	38.1	0.5
Zimbabwe	ZW	51	8	373	-56.8	33.9	1.5
All African focus countries		51	44	7,318	-7.3	25.2 ^c	85.4

Source: Anderson and Valenzuela 2008, based on estimates in chapters 2–18 of this book.

a. Weighted average NRA and standard deviation NRA for covered products using the gross value of production at undistorted prices as weights.

b. Average annual gross value of total production at undistorted prices, in current US\$ billions.

c. Simple average of country five-year averages.

009 **Table B.28. Summary of NRA Data by Major Product, African Focus Countries, 2000–04**

Product	NRA, unweighted average	NRA, weighted average	Gross value of production ^a	Countries included (by ISO code) ^b
Apple ^c	0.0	0.0	0.00	ZA
Banana	0.2	0.3	0.15	CM
Bean	1.1	1.1	0.08	MZ, TZ, UG
Beef	-1.7	-25.1	0.49	EG, ZA, SD
Camel	-18.1	-26.0	5.89	SD
Cashew	87.7	87.7	0.10	MZ, TZ
Cassava	-9.6	-9.9	0.06	BJ, BF, CM, TD, CI, GH, MG, ML, MZ, NG, TZ, TG, UG
Chat	-0.4	-2.6	8.45	ET
Clove	-39.5	-39.5	0.07	MG
Cocoa	-18.7	-18.7	0.05	CM, CI, GH, MG, NG
Coffee	-23.4	-35.8	2.59	CM, CI, ET, KE, MG, TZ, UG
Cotton	-13.5	-12.0	0.70	BJ, BF, CM, CI, TD, EG, ML, MZ, NG, SN, SD, TZ, TG, UG, ZM, ZW
Fruit and vegetables ^c	-20.7	-46.1	1.94	KE
Grape ^c	0.0	0.0	0.14	ZA
Groundnut	4.2	7.4	0.21	GH, MZ, NG, SN, SD., UG, ZM, ZW
Gum arabic	-27.3	-40.3	1.72	SD
Hides and skins	-67.1	-67.1	0.02	ET
Maize	-48.4	-48.4	0.03	CM, EG, ET, GH, KE, MG, MZ, NG, ZA, TZ, UG, ZM, ZW
Milk	3.5	-5.4	7.24	EG, SD
Millet	3.5	14.6	2.99	BJ, BF, CM, TD, ML, MZ, NG, SN, SD, TZ, TG, UG, ZM
Oilseed	-0.3	-2.3	1.79	ET
Orange ^c	-39.4	-39.4	0.08	ZA

Roots & tubers	5.7	8.4	0.23	CM
Palm oil	0.0	0.0	0.38	NG
Pepper	-12.6	-12.6	0.73	MG
Plantain	-10.2	-10.2	0.00	CM, CI, GH, TZ, UG
Potato	-0.1	-0.1	1.93	MZ, TZ
Poultry	0.0	0.0	0.07	ZA
Pulse	2.7	2.7	1.36	ET
Pyrethrum	-20.4	-20.4	0.16	TZ
Rice	-47.7	-47.7	0.00	CI, EG, GH, MG, MZ, NG, SN, TZ, UG, ZM
Sesame	9.0	-5.5	2.45	SD
Sheep meat	-38.1	-38.1	0.20	ZA, SD
Sisal	-10.6	-21.4	1.57	TZ
Sorghum	0.0	0.0	0.01	
Soybean	-2.5	20.7	2.13	ZM, ZW
Sugar	-42.1	-54.2	0.04	EG, KE, MG, MZ, ZA, SD, TZ, UG
Sunflower	54.1	43.7	1.03	ZA, ZM, ZW
Tea	-1.3	-3.5	0.15	KE, TZ, UG
Teff	-30.2	-16.4	0.58	ET
Tobacco	-7.1	-7.1	0.37	MZ, TZ, ZM, ZW
Vanilla	-45.4	-63.0	0.51	MG
Wheat	-12.8	-12.8	0.06	EG, ET, KE, ZA, SD, TZ, ZM, ZW
Yam	14.5	-1.1	4.03	BJ, BF, TD, CI, GH, MG, ML, MZ, NG, TZ, TG, UG
All covered products	-9.6	-7.3	52.8	

Source: Anderson and Valenzuela 2008, based on estimates in chapters 2–18 of this book.

- The average annual gross value of production of covered products is given at undistorted prices (current US\$ billions).
- See table B.27 for a definition of the country codes.
- Even though apple, fruit and vegetables, grape, and orange are covered by only one country, the weighted and simple averages differ because traded and nontraded products have been treated separately.

602 Table B.29. Shares of the Global Volume of Consumption (C) and Production (Q) of Covered Agricultural Products, 16 African Focus Countries, 2000–04

(percent)

Product		CM	CI	EG	ET	GH	KE	MG	MZ	NI	ZA	SE	SD	TZ	UG	ZM	ZW	All studied	World
Apple	C	—	—	—	—	—	—	—	—	—	0.5	—	—	—	—	—	—	0.5	100.0
	Q	—	—	—	—	—	—	—	—	—	1.0	—	—	—	—	—	—	1.0	100.0
Banana	C	0.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.6	100.0
	Q	1.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.0	100.0
Bean	C	—	—	—	—	—	—	—	0.0	—	—	—	—	1.6	2.4	—	—	4.0	100.0
	Q	—	—	—	—	—	—	—	0.0	—	—	—	—	1.6	2.5	—	—	4.1	100.0
Beef	C	—	—	1.2	—	—	—	—	—	—	1.1	—	0.5	—	—	—	—	2.8	100.0
	Q	—	—	0.9	—	—	—	—	—	—	1.0	—	0.5	—	—	—	—	2.4	100.0
Cassava	C	1.1	—	—	—	4.6	—	1.4	—	18.0	—	—	—	4.0	2.8	—	—	31.9	100.0
	Q	1.1	—	—	—	4.6	—	1.4	—	18.0	—	—	—	4.0	2.8	—	—	31.8	100.0
Cocoa	C	0.2	4.8	—	—	1.5	—	0.0	—	5.1	—	—	—	—	—	—	—	11.6	100.0
	Q	3.6	41.4	—	—	13.0	—	0.1	—	10.0	—	—	—	—	—	—	—	68.2	100.0
Coffee	C	0.2	0.4	—	1.7	—	0.1	0.6	—	—	—	—	—	0.0	0.1	—	—	3.2	100.0
	Q	1.1	4.5	—	3.1	—	1.3	0.8	—	—	—	—	—	0.6	1.9	—	—	13.3	100.0
Cotton lint	C	0.1	0.1	0.9	—	—	—	—	0.0	0.8	—	0.0	0.0	0.1	0.0	0.1	0.1	2.3	100.0
	Q	0.5	1.0	1.2	—	—	—	—	0.1	0.8	—	0.0	0.3	0.2	0.1	0.1	0.7	4.9	100.0
Cotton seed	C	0.3	0.5	1.0	—	—	—	—	0.1	0.7	—	0.0	0.3	0.2	0.1	0.1	0.5	3.9	100.0
	Q	0.3	0.7	1.0	—	—	—	—	0.1	0.7	—	0.0	0.3	0.2	0.1	0.1	0.6	4.2	100.0
Grape	C	—	—	—	—	—	—	—	—	—	1.8	—	—	—	—	—	—	1.8	100.0
	Q	—	—	—	—	—	—	—	—	—	2.3	—	—	—	—	—	—	2.3	100.0
Groundnut	C	—	—	—	—	0.6	—	—	0.3	8.4	—	2.1	2.7	—	0.4	0.2	0.5	15.3	100.0
	Q	—	—	—	—	0.6	—	—	0.3	8.3	—	3.0	2.7	—	0.4	0.1	0.5	16.1	100.0

Maize	C	0.1	—	1.8	0.5	0.2	0.5	0.0	0.2	0.7	1.5	—	—	0.5	0.2	0.2	0.3	6.7	100.0
	Q	0.1	—	1.1	0.5	0.2	0.4	0.0	0.2	0.7	1.9	—	—	0.4	0.2	0.1	0.4	6.1	100.0
Milk	C	—	—	0.7	—	—	—	—	—	—	—	—	0.8	—	—	—	—	1.5	100.0
	Q	—	—	0.7	—	—	—	—	—	—	—	—	0.8	—	—	—	—	1.5	100.0
Sheep meat	C	—	—	—	—	—	—	—	—	—	1.8	—	2.3	—	—	—	—	4.1	100.0
	Q	—	—	—	—	—	—	—	—	—	1.4	—	2.3	—	—	—	—	3.7	100.0
Poultry	C	—	—	—	—	—	—	—	—	—	1.3	—	—	—	—	—	—	1.3	100.0
	Q	—	—	—	—	—	—	—	—	—	1.2	—	—	—	—	—	—	1.2	100.0
Rice	C	—	0.3	0.8	—	0.1	—	0.5	0.1	0.8	—	0.2	—	0.2	0.0	0.0	—	3.0	100.0
	Q	—	0.2	1.0	—	0.0	—	0.4	0.0	0.6	—	0.0	—	0.1	0.0	0.0	—	2.4	100.0
Sorghum	C	0.7	—	—	—	—	—	—	—	13.4	—	—	5.2	1.1	0.6	0.1	0.1	21.2	100.0
	Q	0.8	—	—	—	—	—	—	—	13.8	—	—	4.5	1.2	0.6	0.1	0.2	21.1	100.0
Soybean	C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0	0.1	0.1	100.0
	Q	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0	0.1	0.1	100.0
Sugar	C	—	—	1.5	—	—	0.4	0.1	0.2	—	—	—	0.3	0.2	0.1	—	—	2.7	100.0
	Q	—	—	1.0	—	—	0.3	0.1	0.0	—	—	—	0.4	0.1	0.1	—	—	1.9	100.0
Sunflower	C	—	—	—	—	—	—	—	—	—	2.9	—	—	—	—	0.1	0.1	3.1	100.0
	Q	—	—	—	—	—	—	—	—	—	2.1	—	—	—	—	0.1	0.1	2.3	100.0
Tea	C	—	—	—	—	—	1.1	—	—	—	—	—	—	0.1	0.1	—	—	1.2	100.0
	Q	—	—	—	—	—	6.2	—	—	—	—	—	—	0.6	0.8	—	—	7.6	100.0
Wheat	C	—	—	1.9	0.4	—	0.1	—	—	—	0.5	—	0.2	0.1	—	0.0	0.1	3.3	100.0
	Q	—	—	1.1	0.2	—	0.0	—	—	—	0.4	—	0.0	0.0	—	0.0	0.0	2.9	100.0

Source: Based on data from the Food and Agriculture Organization, FAOSTAT.

Note: — = no data are available. See table B.27 for definition of country codes.

Table B.30. Shares of the Global Value of Imports (M) and Exports (X) of Covered Agricultural Products, 16 African Focus Countries, 2000–03

(percent)

Product		CM	CI	EG	ET	GH	KE	MG	MZ	NI	ZA	SE	SD	TZ	UG	ZM	ZW	All studied	Total, world
Banana	M	0.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0	100.0
	X	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.2	100.0
Bean ^a	M	—	—	—	—	—	—	—	0.0	—	—	—	—	0.0	0.0	—	—	0.0	100.0
	X	—	—	—	—	—	—	—	0.0	—	—	—	—	0.2	0.2	—	—	0.4	100.0
Beef	M	—	—	1.6	—	—	—	—	—	—	0.1	—	0.0	—	—	—	—	1.6	100.0
	X	—	—	0.0	—	—	—	—	—	—	0.1	—	0.0	—	—	—	—	0.1	100.0
Coffee ^b	M	0.0	0.0	—	0.0	—	0.0	0.0	—	—	—	—	—	0.0	0.0	—	—	0.0	100.0
	X	1.0	2.5	—	2.6	—	1.6	0.0	—	—	—	—	—	1.1	1.2	—	—	9.9	100.0
Cotton ^c	M	0.0	0.0	0.1	—	—	—	—	0.0	0.1	—	0.0	0.0	0.0	0.0	0.0	0.0	0.2	100.0
	X	1.0	2.2	1.9	—	—	—	—	0.1	0.0	—	0.1	0.8	0.5	0.2	0.1	2.6	9.6	100.0
Groundnut ^d	M	—	—	—	—	0.0	—	—	0.0	0.2	—	0.0	0.0	—	0.0	0.0	0.2	0.4	100.0
	X	—	—	—	—	0.1	—	—	0.0	0.0	—	0.2	0.5	—	0.0	0.0	0.2	1.1	100.0
Maize	M	0.0	—	5.3	0.1	0.0	0.8	0.0	0.2	0.0	0.3	—	—	0.1	0.0	0.0	0.0	6.8	100.0
	X	0.0	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	—	—	0.0	0.0	0.0	0.1	1.0	100.0
Milk	M	—	—	0.7	—	—	—	—	—	—	—	—	0.1	—	—	—	—	0.7	100.0
	X	—	—	0.0	—	—	—	—	—	—	—	—	0.0	—	—	—	—	0.0	100.0

Sheep meat	M	—	—	—	—	—	—	—	—	—	0.9	—	0.0	—	—	—	—	0.9	100.0
	X	—	—	—	—	—	—	—	—	—	0.0	—	0.8	—	—	—	—	0.8	100.0
Poultry	M	—	—	—	—	—	—	—	—	—	0.5	—	—	—	—	—	—	0.5	100.0
	X	—	—	—	—	—	—	—	—	—	0.1	—	—	—	—	—	—	0.1	100.0
Rice	M	—	1.4	0.0	—	0.7	—	0.6	0.3	2.9	—	1.5	—	0.8	0.2	0.0	—	8.4	100.0
	X	—	0.0	1.7	—	0.0	—	0.0	0.0	0.0	—	0.0	—	0.0	0.0	0.0	—	1.8	100.0
Soybean ^e	M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0	0.1	0.1	100.0
	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0	0.1	0.1	100.0
Sugar	M	—	—	0.7	—	—	0.5	0.1	0.7	—	0.0	—	0.1	0.5	0.2	—	—	2.9	100.0
	X	—	—	0.0	—	—	0.0	0.0	0.3	—	2.9	—	0.3	0.1	0.0	—	—	3.6	100.0
Tea	M	—	—	—	—	—	0.0	—	—	—	—	—	—	0.0	0.0	—	—	0.0	100.0
	X	—	—	—	—	—	15.7	—	—	—	—	—	—	1.4	1.3	—	—	18.3	100.0
Wheat	M	—	—	4.2	1.0	—	0.7	—	—	—	0.5	—	1.2	0.3	—	0.1	0.1	8.1	100.0
	X	—	—	0.0	0.0	—	0.0	—	—	—	0.1	—	0.0	0.1	—	0.0	0.0	0.3	100.0

Source: Based on data from the Food and Agriculture Organization, FAOSTAT.

Note: — = no data are available. See table B.27 for definition of country codes.

- a. Includes green and dry beans.
- b. Includes green and roasted coffee.
- c. Includes cottonseed and cotton lint.
- d. Includes groundnuts in shell and shelled.
- e. Soybean complex includes soybeans, cake of soybeans, and oil of soybean.

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ISBN 978-0-8213-7652-2



SKU 17652



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