Report No. 4981-CO

Colombia: External Sector and Agriculture Policies for Adjustment and Growth

(In Two Volumes) Volume II: Technical Analyses

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CURRENCY EQUIVALENTS

Currency Unit = Colombian Peso (Col$)

Exchange Rate As Of January 1, 1984

US$1 = Col$88.770
Col$1 = US$0.01127

Average Exchange Rate

1980		1981		1982		1983	
US$1	= Col$47.280	US$1	= Col$54.491	US$1	= Col$64.102	US$1	= Col$78.861
Col$1	= US$0.0212	Col$1	= US$0.0184	Col$1	= US$0.0156	Col$1	= US$0.0127

WEIGHTS AND MEASURES

Metric System

GOVERNMENT OF COLOMBIA FISCAL YEAR

January 1 - December 31

PART IV - TECHNICAL ANALYSES

TABLE OF CONTENTS

Annex 1

A SIMPLE MODEL OF THE INTERACTION OF COFFEE AND THE REST OF THE ECONOMY*

This annex presents a simple model showing the effects of changes in the price of coffee on the competitiveness of the rest of the economy. In order to simplify the exposition, the model is first derived assuming away monetary effects of changes in the price of coffee; this assumption is relaxed later by introducing a money market. The model traces quite closely the behavior of the price level and of the relative producer prices of non-coffee tradeable goods in Colombia, which is central to the analysis presented in Chapter 1.

Changes in the Coffee Price and Competitiveness

Consider a small open economy with a fixed exchange rate that produces three goods: coffee (C), other (i.e. non-coffee) tradeables (T) and nontradeables (N). Also assume for simplicity that the exchange rate is equal to one; this assumption is relaxed later. The excess demand for nontradeables is assumed to depend on prices and income.

Consider first the case where this excess demand is not affected by the relative price of coffee. As a first approximation, this can be justified by assuming that domestic residents do not consume coffee--or consume negligible amounts relative to exports--and that factors used in the production of coffee are sector-specific both in the short- and long-run. These assumptions are relaxed subsequently. In equilibrium the excess demand for nontradeable goods will be equal to zero, and under these assumptions it can be written as:

$$N = N(q_T, Y) = 0 \qquad (1.1)$$
$$(+)\ (+)$$

where q_T is the relative price of tradeables compared to nontradeable goods (i.e., $q_T = P_T/P_N$), and Y is real income in terms of nontradeables. The signs in parenthesis below the function's arguments refer to the assumed signs of the partial derivatives. The positive sign of q_T stems from the assumption of gross substitutability between nontradeable goods and tradeable goods. Equilibrium in the nontradeable sector requires that the excess demand for this type of good is equal to zero, both in the short- and long-run.

In (1.1) Y is expressed in terms of nontradeable goods, and given by:

$$Y = H_N^S + q_T\ H_T^S + q_C\ \bar{C} \qquad (1.2)$$

where H_N^S, H_T^S and $\bar{C}$ are supplies of nontradeables, tradeables and coffee, respectively, and q_C is the relative price of coffee in terms of nontrade-

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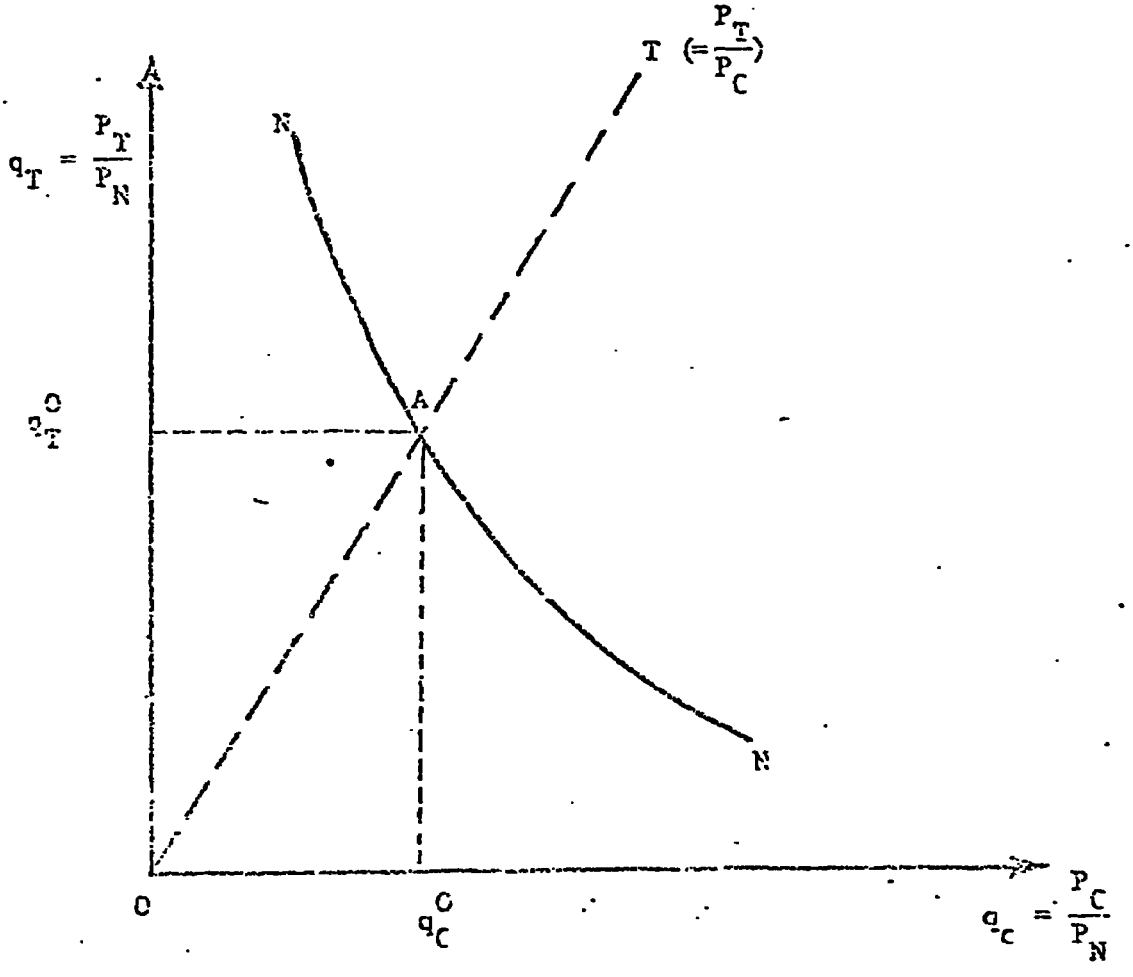
* Annexes 1 through 7 were prepared by Sebastian Edwards.

Figure 1-1 RELATIVE PRICES OF COFFEE AND OTHER TRADEABLES WITH RESPECT TO NONTRADEABLES



able goods. The supply of coffee is held fixed in order to simplify the analysis.

Our interest is to discover the effect of an increase in the price of coffee on the relative price of other tradeables with respect to nontradeables (q_T). Maintaining the assumption of gross substitutability, we can depict the equilibrium situation in the nontradeables market in Figure 1.1, which has been adapted from Dornbusch.1/ The NN schedule describes the combination of q_T and q_C that is compatible with equilibria in the nontradeable goods market. The slope of this curve is given by:

$$(1.3) \qquad \frac{dq_T}{dq_C} = \frac{(\partial N/\partial y)\,\bar{C}}{[(\partial N/\partial q_T) + (\partial N/\partial y)H_T^S]} < 0$$

The ray OT, on the other hand, measures the relative price of other tradeable goods to coffee (P_T/P_C). The initial equilibrium position is given by A with equilibrium relative prices being equal to q_T^0 and q_C^0 respectively.

Assume now that there is an exogenous increase in the price of coffee. The OT ray will then rotate clockwise toward OT' in Figure 1-2. If the (nominal) price of nontradeables were constant, the new equilibrium would be given by B, with a constant relative price of non-coffee tradeables with respect to nontradeables. However, as long as the slope of the NN is negative, at B there will be excess demand for nontradeables that will require an increase of the relative price of these goods, both with respect to the price of coffee and other (non-coffee) tradeables. The final equilibrium will then be attained at C.

As a consequence of the increase of the price of coffee, there has been a decrease of the relative price of non-coffee tradeables both with respect to coffee (i.e., $P_T/P_C^1 < P_T/P_C$) and with respect to nontradeables (i.e., $q_T^0 > q_T^1$). This reduction in the relative price of other tradeables, of course, will encourage resources to move out of the other (non-coffee) tradeables sector into the other sectors of the economy. This phenomenon is similar to what occurred in oil exporting countries as a consequence of the increase in the price of oil in the 1970s, and has been labeled as the Dutch-disease or the De-industrialization effect.1/

In Figure 1-2 the degree of loss of competitiveness of the non-coffee tradeables sector--i.e., the degree of decline of $q_T (=P_T/P_N)$--will depend on the slope of the NN curve. At one extreme, if the NN curve is a vertical line the negative effect on q_T of an exogenous increase in the

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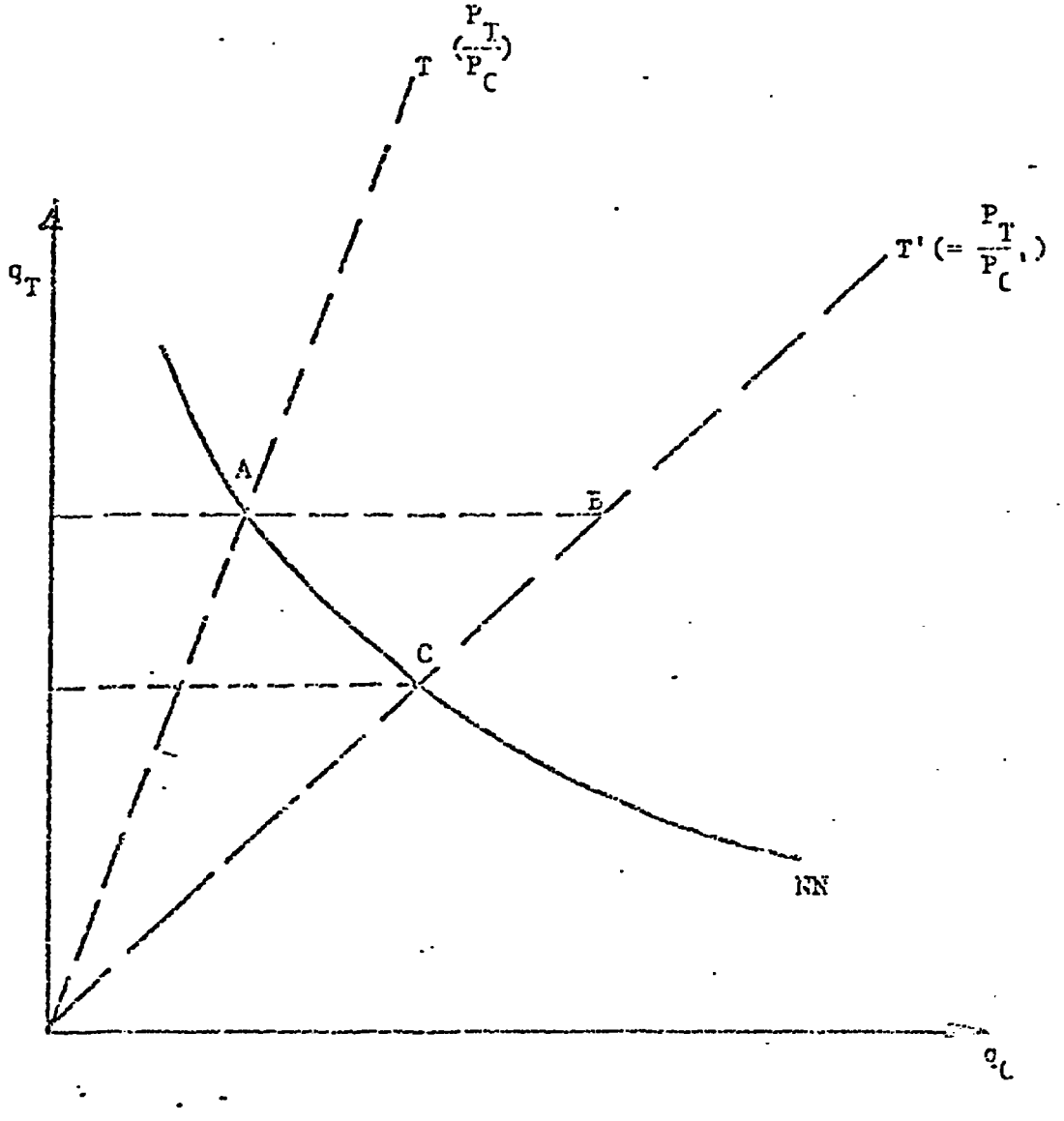
1/ R. Dornbush, "Tariffs and Non-traded Goods", Journal of International Economics (1974); W. M. Corden and J. P. Neary "Booming Sector and De-Industrialization in a Small Open Economy," The Economic Journal (1982).

Figure 1-2 EFFECT OF A COFFEE PRICE INCREASE ON RELATIVE PRICES OF OTHER TRADEABLES



price of coffee will be maximum. On the other hand, if all the additional income generated by the higher price of coffee is spent on tradeables, with none of it being spent on nontradeables, the NN curve is a horizontal line, and there will be no effects of an increase of the price of coffee on q_T.

Consider now the more general case, where coffee is also consumed domestically, but where factors used in its production are still sector-specific. Then, the excess demand for nontradeables will be given by:

$$(1.4) \qquad N = N(\underset{(+)}{q_T}, \underset{(?)}{q_C}, \underset{(+)}{Y}) = 0$$

where the sign of $\partial N/\partial q_C$ will be positive if coffee and nontradeables are substitutes, and negative if they are complements.

The slope of the NN curve will now be equal to:

$$(1.5) \qquad \frac{dq_T}{dq_C} = -\frac{(\partial N/\partial q_C) + (\partial N/\partial Y)\ \bar{C}}{(\partial N/\partial Y)\ H_T^S + (\partial N/\partial q_T)}$$

This expression can be either positive or negative depending on the sign of $(\partial N/\partial q_C)$. If coffee and nontradeables are complements $(\partial N/\partial q_C < 0)$, it is possible that the numerator of equation (1.5) will be negative and the slope of the NN curve will be positive.2/ In this case an increase in the price of coffee will result in an increase in the relative price of other (non-coffee) tradeables, and thus in resources moving from the nontradeables goods sector into the other tradeables sector.

However, if coffee and nontradeables are substitutes--which is the more plausible assumption, given the level of aggregation considered in this model--the NN curve will be negatively sloped and the analysis presented in Figures 1-1 and 1-2--which indicates that a higher price of coffee will reduce the degree of competitiveness of other tradeables--will still hold. In the rest of this section it will be assumed, unless otherwise indicated, that the three goods involved are substitutes in consumption, so that equation (1.5) is negative.

The analysis presented in this section shows that under a set of plausible assumptions, increases in the price of coffee will generate an equilibrium reduction in the relative prices of other tradeables--both in terms of coffee and nontradeables. This movement of relative prices will reduce the level of competitiveness of this sector (non-coffee tradeables),

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2/ Notice that $(\partial N/\partial q_C) < 0$ is a necessary (but not sufficient) condition for NN to be positively sloped. The sufficient condition is that $((\partial N/\partial q_C) = (\partial N/\partial y,\ \bar{c}) < 0$.

with resources tending to move out of it. To the extent that this is an equilibrium result, no particular policy measures should be taken to avoid it.[3/] However, if the change in the price of coffee is only temporary, and the capital market presents some imperfections, there is an argument for implementing policies that will help firms in the non-coffee tradeables sector to "survive" this short run squeeze in their profitability. The more interesting aspect of the model presented here, however, is that it shows that even in the absence of money and inflation, increases in the price of coffee will tend to reduce the degree of profitability of other tradeable goods.

Coffee, Money, Inflation and Competitiveness

The preceding analysis has focused on the long-run effect of an exogenous increase in the price of coffee on the competitiveness of the rest of the tradeable industries. The analysis, however, has abstracted from any dynamic aspects. In this section some dynamic considerations are introduced into the model. To accomplish this two things are done: first we follow Harberger[4/] by explicitly introducing a slowly-clearing monetary sector, and second, a crawling peg system is considered.

In order to organize the discussion we first assume that the exchange rate is fixed. (Later, the exchange rate assumption is changed.) Under these circumstances, an increase in the price of coffee, in addition to its real effects, will affect both the supply and demand for money. It increases the supply of money by producing a balance of payments surplus which the Central Bank monetizes. (It is assumed that the capital account is exogenous and subject to controls.) The demand for money will increase as well, as a result of the increase in income brought about by the higher price of coffee. Theoretically, the overall result may be either a short-run excess (flow) supply or an excess demand for money. By Walras' Law these situations respectively imply an excess demand for goods--both tradeables and nontradeables--or an excess supply of goods. In the former situation, the excess demand for nontradeables goods caused by this short-run monetary disequilibrium will create inflationary pressures which will reinforce the effect caused by the real factors discussed previously (the increase in income resulting from the increase in coffee prices). The result of this process will be that q_T will decrease, in the short-run, by a greater amount than would be caused by real factors alone. In this case, the nominal price of nontradeable goods will tend to overshoot its new long-run

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3/ If externalities are present, however, intervention may be called for; see S. van Winjbergen, "Dutch Disease: How much Disease?", Economic Journal, forthcoming. There could also be income distribution considerations for intervention.

4/ A.C. Harberger, "Dutch Disease: How Much Sickness, How Much Boom" Resources and Energy, (1983).

equilibrium, and the loss of competitiveness of the non-coffee tradeables sector--measured by the decrease of q_T--will be greater in the short- than in the long-run. If, on the other hand, there is an excess demand for money, q_T will decrease in the short-run by less than real factors alone would indicate. In either situation--excess supply or excess demand for money--as the monetary equilibrium is slowly restored through balance of payments surpluses or deficits (under the fixed rate assumption), q_T will move to its new long-run equilibrium value as determined by the real factors in the model discussed in the previous section.

This discussion can be formalized. The excess flow supply for money in nominal terms (M^E) is given by:

$$M^E = \Delta M^S - \Delta M^D \tag{1.6}$$

where ΔM^S is the change nominal supply for money, and M^D is the flow demand for money in nominal terms. Assuming that the demand for money equation M^D (in nominal terms) depends on the usual arguments--real income, the interest rate (i) and the price level--we can write M^D as:

$$M^D = P\, L(\underset{(-)}{i},\ \underset{(+)}{y}) \tag{1.7}$$

where P is the price level given by:

$$P = p_T^{\alpha}\, p_N^{1-\alpha} \tag{1.8}$$

and where the domestic price of the non-coffee tradeable goods is given by:

$$P_T = eP_T^* \tag{1.9}$$

where e is the exchange rate and P_T^* the international price of non-coffee tradeables. Notice that in order to simplify the exposition the price of coffee has not been included in the definition of the price level (equation 1.8).

We further assume that M^E is equal to zero only in the long-run. In particular, an increase of ΔM^S will result in a short-run flow excess supply of money which, under the assumption of fixed rates, will be slowly eliminated through the balance of payments. It is further assumed that, due to Walras' Law, an excess flow supply of money will be reflected in an excess demand for nontradeables and an excess demand for non-coffee tradeables. Then, equation (1.1) has to be modified to incorporate the assumption that in the short-run, an excess flow supply of money is partially translated into an excess demand for nontradeables.

$$N = N(\underset{(+)}{q_T},\ \underset{(+)}{M^E},\ \underset{(+)}{Y}) \tag{1.10}$$

In terms of Figure 1-1 an increase in M^E will result in a downward shift of schedule NN. The model is completed by specifying the balance of payments and the money supply equations.

The balance of payments is defined as:

(1.11) $$B = \Delta R = P_C\bar{C} - P_T E_T + CF$$

where E_T stands for excess demand for traditional tradeables; $\bar{C}$ is the amount of coffee exported; CF refers to capital flows, which are assumed to be exogenous, and ΔR is the change in international reserves. It is also assumed that $\partial B/\partial P > 0$; that is, an increase of the price of coffee will result in an improvement of the balance of payment.5/

The supply of money, on the other hand, is given by

(1.12) $$M^S = M^S_{-1} + \Delta R + \Delta D$$

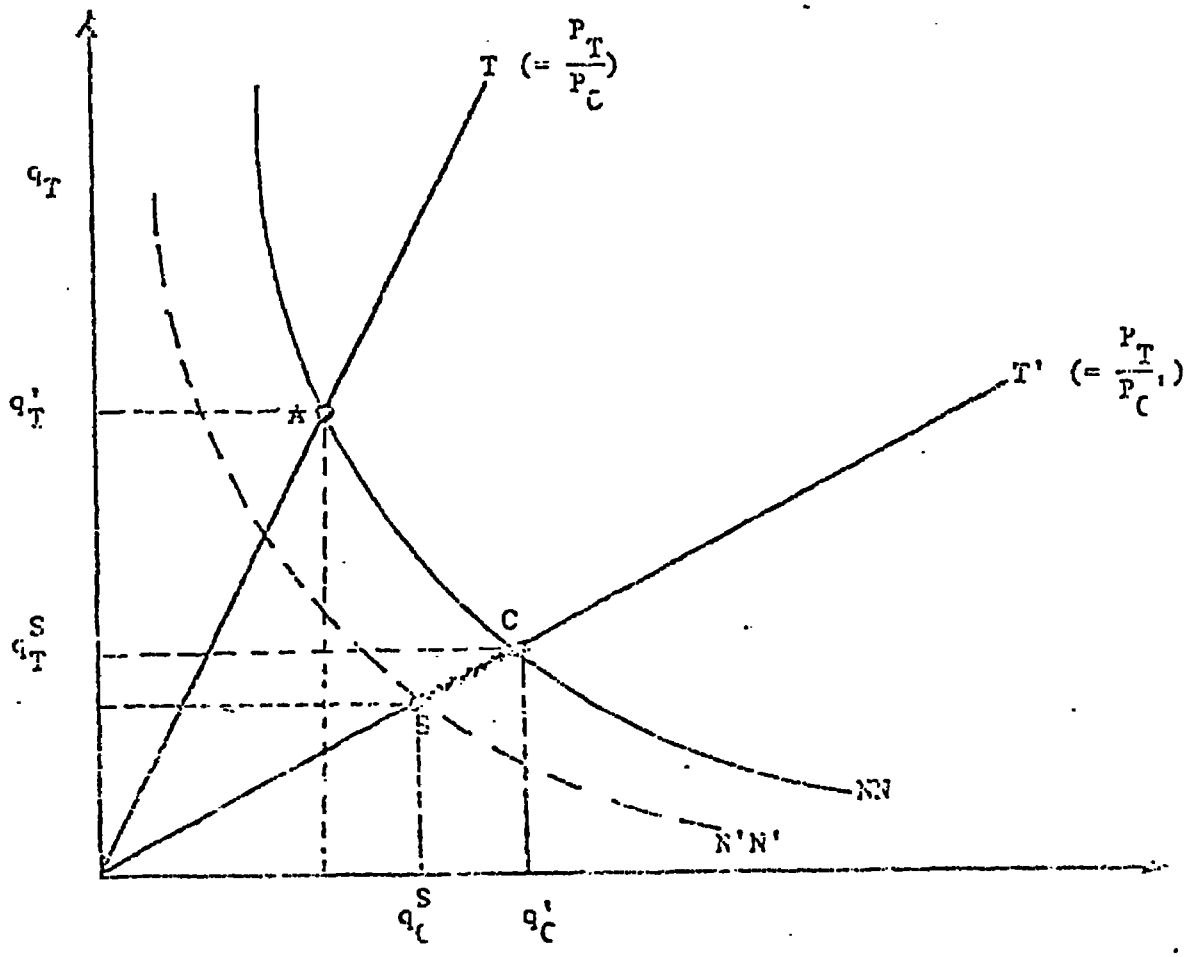
where M^S_1 is the supply of money in the previous period, ΔR is the change in international reserves (i.e., the balance of payments) and is given by equation (1.11), and ΔD is the increase in domestic credit. From (1.12), of course, $\Delta M^S = \Delta R + \Delta D$. This means that M could be considered as high-powered money.

From (1.11) and (1.12) it is easy to see that to the extent that an increase in the price of coffee will result in a balance of payments surplus, $M^S > 0$.6/ Further, assuming that this increase in ΔM^S results in a short-run excess flow supply for money, M^E will increase and there will be an excess demand for nontradeable goods [see equation (1.10)]. In terms of our diagrammatical analysis, this case is captured by Figure 1-3. The exogenous increase in the price of coffee simultaneously results in a downward shift of the NN curve to N'N' (as a consequence of the excess supply of money), and in a rotation of the OT ratio to OT'. The NN curve will shift downward, since if there is an excess supply of money at the old relative prices for nontradeables, there will be an excess demand for these goods. The new short-run equilibrium is attained at S.

5/ The effect of a coffee price increase on the balance of trade is: $\frac{dB}{dP_C} = \bar{C} - P_T\frac{dE_T}{dP_C}$, where $\frac{dE_T}{dP_C} \lessgtr 0$. A sufficient condition for the coffee price increase to result in a $dB>o$ is $dE_T \leq 0$.

6/ Actually $\frac{dM^S}{dP_C} = \bar{C} - P_T\frac{dE_T}{dP_C}$, and if as assumed, $\frac{dE_T}{dP_C} < 0$, $dM^S/dP_C > 0$.

Figure 1-3 COFFEE PRICE INCREASE, MONETARY EFFECTS AND EQUILIBRIUM



Final equilibrium is obtained, as before, at C. The dynamics are characterized by shifts of the N'N' curve to the right towards the NN curve. The speed of this adjustment depends on how fast the excess flow supply of money is eliminated. As may be seen, in this case relative price of non-coffee tradeables undershoots its final equilibrium level. This means that the loss of competitiveness of the non-coffee tradeables sector (as measured by the decline of q_T) is greater in the short-run than in the long-run.

The analysis presented up to this point has assumed, for simplicity, a fixed exchange rate. If, however, a crawling peg system is allowed, the result presented are not altered in any significant way. Specifically, equation (1.10) on the nontradeables market equilibrium condition remains unchanged. Now, however, we find that in the steady state (assuming that P_C^* and P_T^* do not change), the following expression will hold [from (1.8) and (1.9)]:

$$\hat{e} = \hat{P}_N = \hat{P} \qquad (1.13)$$

where (^) refers to percentage change. From (1.13), it may be seen that the real exchange rate--defined as $s = e\, P_T^*/P_N$--will be constant. As was discussed, as a consequence of an increase in the price of coffee there will be pressures--stemming both from the income and inflationary effect--for P to increase. If the monetary authorities do not alter the rate of devaluation of the crawl, the following will result:

$$\hat{e} < \hat{P} < \hat{P}_N \qquad (1.14)$$

In other words, the real exchange rate will decline with the consequent loss of competitiveness in the non-coffee tradeables sector. Notice that the previous discussion can be considered as a special case, where $\hat{e} = 0$. Of course, the monetary authority has the option of accelerating the rate of crawl so that this real appreciation can be (partially) avoided. This, however, was not the case of Colombia during the last coffee bonanza. In fact as discussed in Chapter 1, the authority slowed down the rate of devaluation of the crawling peg. This reaction of the Government seems to be consistent with empirical evidence on the determinants of crawling peg rules. In a recent paper, Yuravlivker investigated the determinants of the crawling peg rule for four Latin-American countries (Argentina, Brazil, Chile and Uruguay), finding that when international reserves increased above their "desired" level, the monetary authority tends to reduce the rate of devaluation of the peg.[7/]

7/ D. Yuravlivker, "Crawling Peg and the Real Exchange Rate: Theory and Evidence", mimeo., Clark University (1983).

ANNEX 2

COFFEE, MONEY AND INFLATION IN COLOMBIA: EMPIRICAL RESULTS

The previous annex has shown that, under a set of plausible assumptions, changes in the price of coffee would tend to have important effects on the rest of the Colombian economy. Specifically, it was argued that an increase in the price of coffee would reduce the level of competitiveness of the other (non-coffee) tradeables goods sector. The model indicated that a higher price of coffee would tend to result in a balance of payments surplus, an increase in the quantity of money and inflation. This increase in the price level, in turn, if not matched by an equivalent devaluation, would generate a real appreciation of the domestic currency, squeezing the profitability out of the non-coffee tradeable goods sector.

These aspects of the model are empirically analyzed in this annex using annual data for 1952-1980. Specifically, it is investigated whether higher (lower) prices of coffee have resulted in higher (lower) rates of growth of high-powered money in Colombia; the relationship between the growth of high-powered money and inflation is also analyzed. These analyses support the discussion in Chapter 1.

The model tested in this section is given by equations (2.1) and (2.2), where as before ($\wedge$) refers to a percentage change.

$$(2.1) \qquad \hat{M}_t = c_0 + \sum_{i=1}^{3} c_i \hat{M}_{t-i} + \gamma_1 DEH_t + \gamma_2 P_{c_t} + u_t$$

$$(2.2) \qquad \hat{P}_t = \alpha_0 + \delta_1 \hat{M}_t + \delta_2 \hat{y}_t + \delta_3 \hat{PX}_t + \delta_4 DUM_t + \varepsilon_t$$

where:

P = price level (consumer price index)
M = high-powered money
DEH = ratio of fiscal deficit (in nominal pesos) to high-powered money
P_c = log of the nominal price of coffee, in pesos
y = real income
PX = "world" price of tradeables expressed in peso terms
DUM = dummy variable, that takes a value of zero between 1952 and 1966 and 1 from 1967 onwards.

Equation (2.1) postulates that the rate of growth of high-powered money depends on its past rates of growth (up to three periods), the magnitude of the fiscal deficit and on the price of coffee. Variable DEH--which measures the fiscal deficit relative to high-powered money--is included since the fiscal deficit in Colombia is (partially) financed by money creation.1/ From an empirical point of view the deficit included in (2.1)

1/ J.A. Ocampo and G. Perry, "La Reforma Fiscal 1982-1983" Coyuntura Economica (March 1983); S. Edwards, "The Short-Run Relation Between Inflation and Growth in Latin America: Comment", American Economic Review, (June 1983).

has to be calculated excluding from government revenues, those generated by the revaluation of reserves through the Special Exchange Account. On the other hand, the inclusion of P_c in (2.1) captures the effect that changes in the price of coffee have on the accumulation of reserves, and in the rate of change of high-powered money. In the estimation of (2.1), it is expected that $\gamma_1 > 0$ and $\gamma_2 > 0$.

Equation (2.2), on the other hand, is a traditional open economy inflation equation.[2/] This expression relates the rate of inflation (P) to the rate of growth of high-powered money, the rate of growth of income and the rate of change of external prices. This equation responds to the notion that the price level is of the following form:

$$P = P_T^{\alpha} P_N^{(1-\alpha)}$$

[see equation (2.8)], with nontradeable prices (P_N) responding to monetary pressures (and the rate of devaluation), and tradeables (P_T) prices being affected by external prices (world inflation plus the rate of devaluation). Notice that ideally one would also want to include changes in the interest rate in (2.2). However this was not done in the present version of the model, due to nonavailability of the required data. In this expression it is expected that $\delta_1 > 0$, $\delta_2 < 0$, $\delta_3 > 0$ and $\delta_4 > 0$.

The estimation of (2.1) and (2.2) for 1952-1980 by ordinary least squares yielded the following results, where t-statistics are in the parentheses, D.W. refers to the Durbin-Watson statistic, R^2 is the coefficient of correlation and L is the log of the likelihood function. The results for (2.1) are:

$$(2.3) \qquad \hat{M}_t = \underset{(-2.961)}{-.146} + \underset{(3.247)}{.498}\,\hat{M}_{t-1} - \underset{(-4.640)}{.637}\,\hat{M}_{t-2} + \underset{(1.005)}{.063}\,\hat{M}_{t-3}$$

$$+ \underset{(2.423)}{.190}\,DEH_t + \underset{(5.281)}{.053}\,P_{c_t}$$

$$R^2 = 0.827$$

$$D.W. = 1.929$$

$$L = 54.530$$

2/ A.C. Harberger, op. cit.; J. Hanson, "Short-Run Macroeconomic Development and Policy in Colombia", mimeo., IBRD, 1982.

The estimation of (2.2) for 1952-1980 using OLS yielded:

$$(2.4) \qquad \hat{P} = \underset{(.605)}{.033} + \underset{(2.933)}{.458}\,\hat{M}_t - \underset{(0.764)}{.747}\,\hat{y}_t + \underset{(1.871)}{.200}\,\hat{PX}_t + \underset{(.804)}{.022}\,DUM_t$$

$$R^2 = .562$$

$$D.W. = 1.854$$

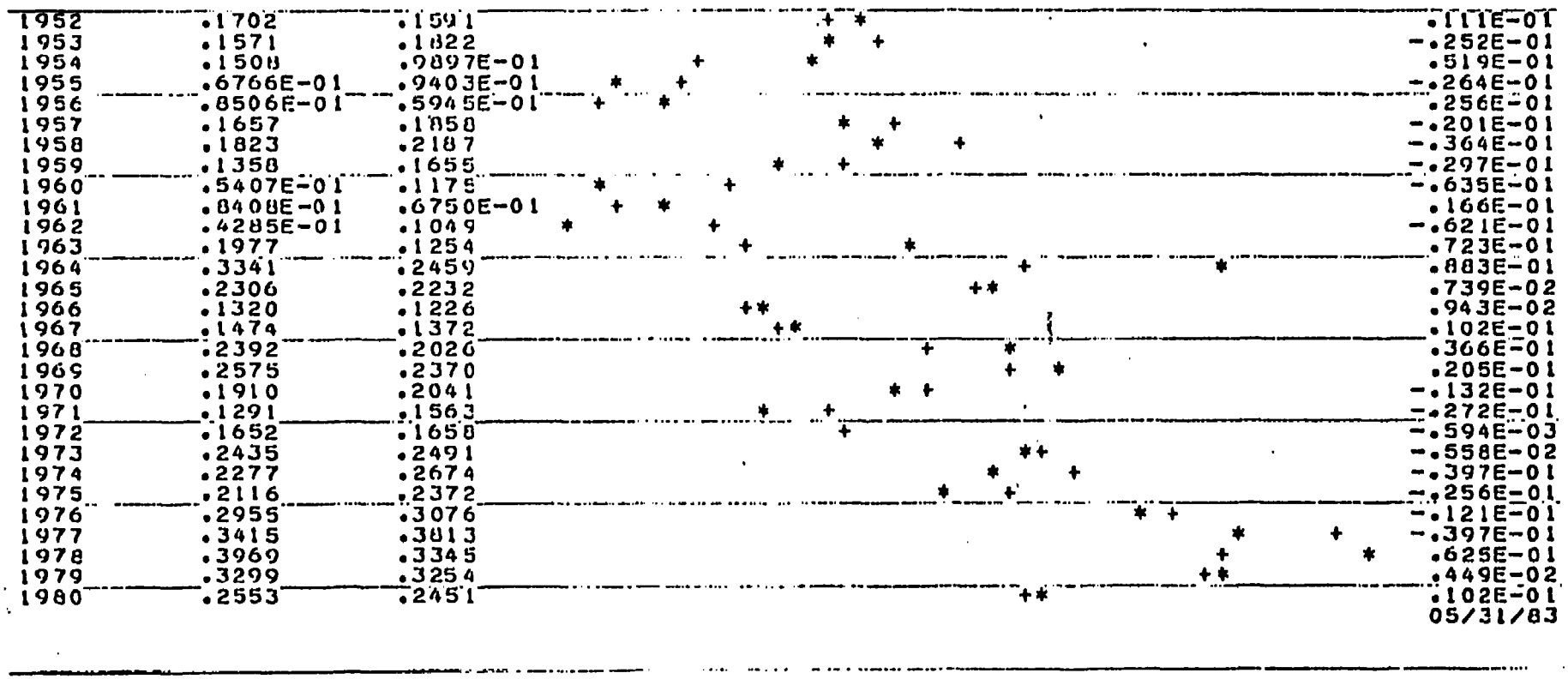
$$L = 43.821$$

Figures 2-1 and 2-2, on the other hand, include a representation of actual and fitted values. These results [equations (2.3) and (2.4)] are very interesting. First, the fit is quite satisfactory, as measured by the R^2. Second, and more important, the coefficients of all relevant parameters have the expected signs and are significant at conventional levels. From equation (2.3) it may be seen that the rate of growth of high-powered money in Colombia can be well explained by lagged rates of growth of M, by the fiscal deficit and the price of coffee.

These results show that, as our model predicted, with other things given a higher (lower) price of coffee would result in higher (lower) rates of growth of high-powered money. The estimated coefficient (0.053) is highly significant—with a t-statistic of 5.28—and indicates that (with other things given) a 10% increase in the peso price of coffee will tend to result in an increase in the rate of growth of nominal high-powered money of approximately one-half of one percentage point.

Equation (2.4), on the other hand presents the results obtained for the inflation equation. All coefficients have the expected signs, with those corresponding to $\hat{M}_t$ and PX_t being significant at the conventional levels. The coefficient of $\hat{M}_t$ indicates that, with other things constant, an increase in higher-powered money by 10% will generate a rise in the rate of inflation of approximately 5%. This coefficient is below the hypothesized unitary value for closed economies. However, it is perfectly consistent with the case of semi-open economy, where we can postulate that an increase in the quantity of money will be partially reflected in prices and partially in a loss of international reserves (and/or change in the exchange rate). The coefficient of PX_t suggests that if money is held constant, an increase in the rate of growth of the peso price of tradeables in 10%—generated by higher world inflation and/or rate of devaluation—will result in an increase of the rate of inflation of only 2%. This result, which may appear somewhat surprising, is consistent with recent findings by Hanson (Ibid), who using different data and a slightly shorter period of time found a significant coefficient of 0.25. However, this result should be taken with caution when analyzing policy alternatives. In particular, it should be emphasized that a higher rate of devaluation will

Figure 2-1 PLOT OF ACTUAL(*) AND FITTED(+) VALUES



ID	ACTUAL	FITTED	RESIDUAL
1952	.1702	.1591	.111E-01
1953	.1571	.1822	-.252E-01
1954	.1508	.9897E-01	.519E-01
1955	.6766E-01	.9403E-01	-.264E-01
1956	.8506E-01	.5945E-01	.256E-01
1957	.1657	.1858	-.201E-01
1958	.1823	.2187	-.364E-01
1959	.1358	.1655	-.297E-01
1960	.5407E-01	.1175	-.635E-01
1961	.8408E-01	.6750E-01	.166E-01
1962	.4285E-01	.1049	-.621E-01
1963	.1977	.1254	.723E-01
1964	.3341	.2459	.883E-01
1965	.2306	.2232	.739E-02
1966	.1320	.1226	.943E-02
1967	.1474	.1372	.102E-01
1968	.2392	.2026	.366E-01
1969	.2575	.2370	.205E-01
1970	.1910	.2041	-.132E-01
1971	.1291	.1563	-.272E-01
1972	.1652	.1658	-.594E-03
1973	.2435	.2491	-.558E-02
1974	.2277	.2674	-.397E-01
1975	.2116	.2372	-.256E-01
1976	.2955	.3076	-.121E-01
1977	.3415	.3813	-.397E-01
1978	.3969	.3345	.625E-01
1979	.3299	.3254	.449E-02
1980	.2553	.2451	.102E-01

05/31/83

Figure 2-2 PLOT OF ACTUAL(*) AND FITTED(+) VALUES

ID	ACTUAL	FITTED	RESIDUAL
1952	-.2353E-01	.6902E-01	-.926E-01
1953	.8004E-01	.5840E-01	.216E-01
1954	.7411E-01	.5278E-01	.213E-01
1955	.0	.3609E-01	-.361E-01
1956	.5942E-01	.4923E-01	.102E-01
1957	.1431	.1806	-.375E-01
1958	.1398	.2058	-.660E-01
1959	.6318E-01	.4377E-01	.194E-01
1960	.4000E-01	.3440E-01	.561E-02
1961	.8155E-01	.3593E-01	.456E-01
1962	.2968E-01	.2159E-01	.809E-02
1963	.2744	.1502	.124
1964	.1636	.1420	.217E-01
1965	.3340E-01	.1460	-.113
1966	.1799	.1122	.677E-01
1967	.7910E-01	.1068	-.277E-01
1968	.5747E-01	.1485	-.910E-01
1969	.9628E-01	.1472	-.509E-01
1970	.6544E-01	.1147	-.493E-01
1971	.7830E-01	.9454E-01	-.162E-01
1972	.1257	.1021	.236E-01
1973	.1894	.1555	.338E-01
1974	.2161	.1698	.463E-01
1975	.2070	.1761	.309E-01
1976	.1840	.1889	-.493E-02
1977	.2860	.1998	.862E-01
1978	.1634	.2002	-.369E-01
1979	.2210	.2099	.111E-01
1980	.2352	.1902	.450E-01

be translated in 0.2 higher inflation only if all other variables are held constant. If, for example, this is not the case, and both the rate of devaluation and the rate of growth of high-powered money are increased by 10%, the rate of inflation will tend to increase by approximately 7%.

The results reported in equation (2.3) and (2.4) empirically confirm the link between the price of coffee and inflation: a higher price of coffee generates a higher rate of growth of high-powered money [equation (2.3)], and a higher rate of growth of high-powered money produces a higher rate of inflation [equation (2.4)]. From these results it can be seen that to the extent that the authorities do not accelerate the rate of crawl, a higher price of coffee will result in a real appreciation of the peso.3/

The conclusion that changes in the price of coffee affect the rest of the economy through a higher rate of inflation is based on the results obtained from the estimation of equation (2.1). In order to analyze if these results are sensitive to the period used (1952-1980), regressions were also run for alternative periods. Table 2.1 summarizes the results obtained in these cases. As may be seen from this table, the results are robust regarding the specification of the time period used. This evidence shows that this relationship between fiscal deficits, the price of coffee and the rate of growth of high-powered money has been stable through the last 10 years.

The equation for the rate of growth of high-powered money [equation (2.1)] was also estimated excluding M_{t-3}--which was the only insignificant term. The estimation for this case, using annual data for 1952-1980, yielded the following results:

$$(2.5) \qquad \hat{M}_t = \underset{(-2.893)}{-0.142} + \underset{(3.115)}{0.433}\,\hat{M}_{t-1} - \underset{(-4.557)}{0.593}\,\hat{M}_{t-2} + \underset{(2.804)}{0.211}\,DEH_t + \underset{(5.609)}{0.555}\,P_{c_t}$$

$$R^2 = 0.787$$

$$D.W. = 1.744$$

As may be seen these results confirm those reported above.

3/ Estimation of (2.1) using OLS may cause a simultaneity bias, since P_c is in pesos and so it depends on the world coffee price and the exchange rate, and chages in $\hat{M}_t$ can affect the exchange rate. We find, however, that the exchange rate is econometrically exogenous to $\hat{M}_t$, thus avoiding this problem.

Table 2-1: EQUATIONS FOR THE RATE OF GROWTH OF HIGH-POWERED MONEY FOR DIFFERENT PERIODS

$$\hat{M}_t = \alpha_0 + \sum_{i=1}^{3} \alpha_i \hat{M}_{t-i} + \gamma_1 DEH + \gamma_2 P_{c_t} + u_t$$

	Eq. 2.1	Eq. 2.2	Eq. 2.3	Eq. 2.4
Period	1952-1970	1952-1975	1952-1977	1952-1973
α_0	-0.272 (-2.096)	-0.131 (-1.798)	-0.110 (-2.034)	-0.182 (-2.063)
α_1	0.405 (2.018)	0.433 (2.443)	0.428 (2.599)	0.448 (2.446)
α_2	-0.722 (-4.041)	-0.684 (-4.541)	-0.665 (-4.730)	-0.712 (-4.511)
α_3	0.061 (0.804)	0.047 (0.682)	0.044 (0.666)	0.050 (0.706)
γ_1	0.200 (1.978)	0.210 (2.296)	0.200 (2.427)	0.209 (2.220)
γ_2	0.079 (3.283)	0.054 (3.921)	0.050 (5.006)	0.063 (3.853)
D.W.	1.878	1.727	1.725	1.850
R^2	0.723	0.635	0.738	0.637
L	35.02	45.09	49.60	41.20

The values in parentheses refer to t-statistics; D.W. is the Durbin-Watson statistic; R^2 is coefficient of correlation; and L is the log of the likelihood function.

The results for the rate of growth of high-powered money and inflation equations reported above were obtained using OLS. The reason for using OLS is that this system [equations (2.1) and (2.2)] is block recursive, with growth of money (M) entering the inflation equation, but with the rate of inflation not entering the rate of high-powered money equation. To the extent that this is the case, then, the use of OLS is appropriate. However, in order to be on the safe side, the system of equations (2.1) and (2.2) was also estimated simultaneously using a Full-Information-Maximum Likelihood (FIML) technique. The following result was obtained for the period 1952-1980. (Notice that this particular system excludes M_{t-3} from the money growth equation):

FIML: Annual Data 1952-1980

(2.6)
$$\hat{M}_t = \underset{(-2.531)}{-0.151} + \underset{(2.330)}{0.410}\,\hat{M}_{t-1} - \underset{(-4.477)}{0.587}\,\hat{M}_{t-2} + \underset{(2.404)}{0.203}\,DEH_t + \underset{(4.198)}{0.057}\,P_{c_t}$$

D.W. = 1.704

$$\hat{P}_t = \underset{(0.377)}{0.035} + \underset{(2.039)}{0.514}\,\hat{M}_t - \underset{(-0.682)}{0.844}\,\hat{y}_t$$

(2.7)
$$+ \underset{(1.911)}{0.134}\,\widehat{PX}_t + \underset{(0.636)}{0.022}\,D_t$$

D.W. = 1.842

$$\hat{\Sigma} = \begin{vmatrix} 0.0014 & -0.0002 \\ -0.0002 & 0.0030 \end{vmatrix}$$

$$L = 97.32$$

where $\hat{\Sigma}$ is the covariance matrix of the residuals, and L is, as before, the log of the likelihood function.

Conclusion

This annex analyzed the relationship between coffee and inflation in the Colomian economy, and tested a Dutch-Disease type of model. As set out in Chapter 1, it is shown that changes in the price of coffee will generally tend to result in a higher rate of inflation and a lower real exchange rate. Specifically the empirical analysis tested the link between the price of coffee, the fiscal deficit and the rate of growth of high-powered money and also the relationship between money and inflation in Colombia. The results confirm some of the main characteristics of the Dutch-Disease type model. In particular, these results indicate that, with other things given, a higher (lower) price of coffeee will result in a higher (lower) rate of inflation and in a lower (higher) real exchange rate.

ANNEX 3

EXCHANGE RATE AND NON-COFFEE EXPORTS

Previous Studies

A number of studies have econometrically investigated the determinants of non-coffee exports in Colombia.[1]/ The results obtained have generally supported the hypothesis that both the real exchange rate--or the domestic relative price of non-coffee exports--and the level of world economic activity have been important in determining the volume of non-coffee (or minor) exports. As may be seen from Table 3-1, however, these studies have generated a wide range of values for the relevant elasticities. The elasticities presented in this table, however, have been obtained using different methods and different specifications of the non-coffee exports function, and in that sense, the results are not directly comparable and should be interpreted as providing approximate orders of magnitude. One of the purposes of the results presented in this annex is to narrow the range in the previous estimates by providing our own recent results.

A central purpose of this annex is to provide policy support in the area of exchange rate management. Much confusion has surrounded the issue of whether non-coffee exports respond to changes in the real exchange rate. This annex shows that--while there is little doubt that the world economic growth (and quantitative restrictions abroad) seriously affects Colombia's exports--the level of the real exchange rate also provides the crucial edge. In the absence of an adequate real exchange rate, the dynamism of the export sector will be seriously impaired.

1/ See F. Montes, "Principales Determinantes del Comportamiento de la Cuenta Coriente Durante La Decada", in Ensayo Sobre Politica Economica, 1982; J. A. Ocampo, "Politica Economica Bajo Condiciones Cambiantes del Sector Externo", in Ensayos Sobre Politica Economica, (1982); and "En Defense de la Continuidad del Regimen Cambiario", Coyuntura Economica, (March 1983).

TABLE 3-1 ESTIMATED ELASTICITIES FOR NON-COFFEE EXPORTS FUNCTIONS IN COLOMBIA

	Study	Dependant Variable	Price Elasticity	Income Elasticity	Period
1.	Teigeiro-Elson (1973)	Value of minor exports excluding gold and bananas	1.34	-	1948-1971 (Annual)
2.	Teigeiro-Elson (1973)	Value of manufactured exports	5.43	-	1966-1971 (Quarterly)
3.	Diaz-Alejandro (1976)	Change in value of minor exports	0.81/0.87	-	1955-1972 (Annual)
4.	Diaz-Alejandro (1976)	Change in value of minor exports except coffee, bananas, sugar, tobacco	0.59	-	1955-1970 (Annual)
5.	Diaz-Alejandro (1976)	Annual changes in value of minor exports	0.68/1.04	-	1955-1972 (and sub-periods) (Quarterly)
6.	Cardona (1976)	Real minor exports	1.36	-	1967-1976
7.	Carrizosa (1979)	Real non-coffee exports	0.55	-	1960-1976 (Annual)
8.	Carrizosa (1979)	Non-coffee real export	0.57	5.34	1960-1976 (Annual)
9.	Echavarria (1980)	Minor real exports excluding gold	0.90	0.91	1960-1967 (Annual)
10.	Echavarria (1980)	Minor real exports excluding gold and diamonds	0.94	1.12	1960-1967 (Annual)

Sources: J.D. Teigeiro and R.A. Elan, "El Crecimiento de las Exportaciones menores y el Sistema de Fomento de Exportaciones en Colombia", Revista del Banco de la Republica (1973); Diaz-Alejandro, op. cit.; M.H. Cardona, "El Crecimiento de las Exportaciones Menores y el Sistema del Fomento de Exportaciones en Colombia" Revista de Planeacion y Desarrollo (1977); M. Carrizosa, "El Futuro de la Balanza Comercial", La Economia Colombiana en la Decada de los Ochenta, FEDESARROLLO, (Bogota, 1981); J.J. Echavarria, "La Evolucion de las Exportaciones Colombianas y sus Determinantes: Un Analisis Empirico" Revista del Banco de la Republica, (1980); Ocampo op cit; and Montes op. cit.

A Simple Model to Determine Colombia's Non-Coffee Exports

In general the quantity exported of a particular good depends on relative prices and levels of economic activity in the rest of the world and in the country under consideration. It would be expected that the quantity exported depends positively on the domestic relative price of exports and on the level of economic activity in the rest of the world. On the other hand exports may vary negatively with the level of activity in the domestic economy, if a higher domestic level of activity raises the domestic demand for exportable goods and lowers the exportable surplus of that good. With these premises, if it is further assumed that the long run export function has a double-log form, the following may be postulated:

$$(3.1) \qquad \log X_t = a_o + a_1 \log PX_t + a_2 \log YW_t + a_3 \log Y_t + u_t$$

where, X_t = long run desired quantity of exports, PX_t = domestic relative price of exports, YW_t = world real level of economic activity, Y_t = domestic real level of economic activity. It is expected that $a_1 > 0$, $a_2 > 0$ and $a_3 < 0$. Since PX_t is the domestic relative price of exports, it will depend on their world price in foreign currency, on the effecive exchange rate and on the peso price of other goods:

$$(3.2) \qquad PX_t = E_t \cdot PXW_t / P_t$$

where PXW_t is the world price of exports (in dollar terms), E is the effective nominal exchange rate (i.e., it incorporates the role of export subsidies), and P_t is the peso price of other goods. Since E_t in (3.2) is the effective nominal exchange rate it will be given by:

$$(3.3) \qquad E_t = \ell_t(1 + s_t)$$

where ℓ_t is the nominal exchange rate and s_t is the average export subsidy. From (3.3), (3.2) and (3.1) it can be seen that an increase of s_t, with other things given, will result in a higher relative price of exports, and thus in a higher quantity exported.

In the case of Colombia's non-coffee exports, subsidies have been quite important since 1967 [see IBRD Report No. 4444; see also Diaz-Alejandro, 1976]. Since 1967, the exports incentives system in Colombia has been based on three major tools: Plan Vallejo; PROEXPO credit; and CAT.[2/] Recently, both the implicit subsidy in PROEXPO's credit and CAT's rates have been increased in an effort to partially compensate the overvaluation of the peso. In Annex 5 a detailed description of CAT rates for 1978, 1981 and 1983 is presented.

2/ See IBRD Report No. 4444 for a detailed description of the behavior of these three incentive schemes.

It is generally accepted that the quantity actually exported of any particular good does not adjust instantaneously to changes in its determinants[3]/. For that reason, the equations usually used to describe the behavior of actual exports (X_t) include lagged coefficients of its determinants.

$$(3.4)\quad \log X_t = \alpha_0 + \sum_{i=0}^{k} \beta_i \log PX_{t\,i} + \sum_{i=0}^{k} \gamma_i \log YW_{t\,i} + \sum_{i=0}^{k} \delta_i \log Y_{t-i} + W_t$$

Under this formulation, β_0, γ_0, and δ_0 can be interpreted as short run elasticities, while the sum of the β_i's, γ_i's and δ_i's are long run elasticities. The next section presents results obtained from the estimation of equations of the type of (3.4) using Colombian quarterly data for 1970-1981.

Estimation of the Model

The Data

The first problem faced in the estimation of equation (3.4) is related to finding the appropriate data. The dependent variable is X_t, the quantity (volume) of non-coffee exports. However, export data are generally available in the form of (an index of the) value of exports VX_t. For this reason, X_t was defined as:[4]/

$$(3.5)\quad X_t = \frac{VX_t}{PNC_t}$$

where PNC_t is the price index of non-coffee exports. A problem with (3.5), however, is that there is no directly available data for PNC_t. Therefore this index was constructed using data on the total export price index PXT_t and on a coffee exports price index PC_t, which are available from the IFS. Assuming that PXT_t has a Cobb-Douglas form $PXT_t = PC_t^{\lambda}\, PNC^{1-\lambda}$, PNC_t can be computed as:

$$(3.6)\quad PNC_t = \exp\,(1-\alpha)^{-1}\,[\log PXT_t - \alpha \log PC_t]$$

3/ E. Cardoso, and R. Dornbusch. "An Equation for Brazil's Exports", Revista Brasilera de Economia (1974); J.F. Wilson, and W.E. Takas, "Differential Responses to Price and Exchange Rates Influences in the Foreign Trade of Selected Countries", Review of Economics and Statistics (1979); M. Goldstein and M. Khan "Income and Price Effects in Foreign Trade", IMF (1983).

4/ E. Leamer and R. Stern, Quantitative International Economics, (Allyn and Salon, Boston, 1970).

In the actual computation of PNC_t, both PNT_t and PC_t were obtained from the IFS. With respect to α it was considered to be variable (that is, α_t varies for each t), and in each period it was taken to be equal to that period's ratio of the value of coffee exports to total exports. The relative price variable PX was constructed as the effective nominal Peso/U.S. dollar rate times the U.S. WPI, divided by Colombia's CPI. In that sense, PX can be interpreted as being a measure of the real exchange rate. The rest of the world level of activity YW was proxied by the U.S. real GNP, which was taken from the IFS. The domestic real level of activity, on the other hand, was defined as domestic real GNP, using data from Montes and Candelo 5/ which were supplemented for the recent years by DNP.

Results

Equation (3.4) was estimated using polynomial distributed lags, or Almon Lags [see Goldstein and Khan op cit., for a discussion on lagged representation in international trade empirical analyses]. A problem usually faced when Almon lags are used is that it is not possible to know a priori the appropriate order of the polynomial and/or the constraints to be imposed on its form. For this reason, and in order to check for the robustness of the empirical results, alternative combinations of the polynomial degree and of the constraints were tried. The length of the lag structure (i.e., the value of k in equation (3.4) was varied between 4 and 12 quarters, and the "best" results were obtained when a six-quarters lag structure was used, which are reported here.

Tables 3-2, 3-3, 3-4, and 3-5 contain the results obtained from the estimation of the non-coffee exports equation for Colombia under alternative formulation of the polynomial structure. As may be seen, the results are quite satisfactory. Even though the R^2's, are rather low, all the coefficients have the expected signs, and many of them are significant at the conventional levels. Moreover, the sum of lagged coefficients were always significant for the relative price (REX) world real income (YW) variables. They, however, were never significant for the domestic real income variable Y.

5/ G. Montes and R. Candelo, "El Enfoque Monetario de la Balanza de Pagos: El caso de Colombia, 1968-1980," Revista de Planeacion y Desarrollo, May-August 1982.

TABLE 3-2 NON-COFFEE EXPORTS FUNCTION: ALMON LAGS, QUARTERLY DATA, 1971-1981

[Third Degree Polynomial, No end Constraints]

Lag (i)	Constant	log REX_{t-i}	log YW_{t-i}	log y_{t-i}
0	-123.063	1.331	2.676	-0.115
	(-2.584)	(2.503)	(1.977)	(-0.118)
1		0.690	2.236	-0.661
		(2.774)	(2.765)	(-1.283)
2		0.217	1.794	-0.981
		(1.240)	(2.260)	(-2.380)
3		-0.088	1.349	-1.075
		(-0.378)	(1.494)	(-2.198)
4		-0.227	0.902	-0.943
		(-0.920)	(1.064)	(-1.949)
5		-0.197	0.452	-0.585
		(-1.157)	(-.816)	(-1.792)
Sum of lagged coefficients		1.725	9.409	-4.360
D.W.	1.552			
R^2	0.329			
SEE	0.180			

Note: The values in parentheses are t-statistics. SEE is the standard error of the regression. D.W. is the Durbin-Watson statistic.

TABLE 3-3 NON-COFFEE EXPORTS FUNCTION: ALMON LAGS

QUARTERLY DATA, 1971-1981

[Fourth Degree Polynomial, No end Constraints]

Lag (i)	Constant	log REX_{t-i}	log YW_{t-i}	log y_{t-i}
0	-85.278 (-1.492)	1.848 (2.136)	0.379 (0.162)	-0.133 (-0.133)
1		0.459 (0.973)	3.433 (2.930)	-0.846 (-0.931)
2		-0.221 (-0.360)	3.331 (2.409)	-0.942 (-1.102)
3		-0.398 (-1.076)	1.505 (1.612)	-0.663 (-1.067)
4		-0.282 (-0.867)	-0.614 (-0.460)	-0.252 (-0.368)
5		-0.080 (-0.182)	-1.592 (-1.044)	0.049 (-.072)
Sum of lagged coefficients		1.327	6.442	-2.786
D.W.	1.605			
R^2	0.380			
SEE	0.180			

Note: Numbers in parentheses refer to t-statistics. SEE is the standard deviation of the regression. D.W. is the Durbin-Watson statistic.

TABLE 3-4 NON-COFFEE EXPORTS FUNCTION: ALMON LAGS

QUARTERLY DATA, 1971-1981

[Third Degree Polynomial, Far end Constraint]

Lag (i)	Constant	log REX_{t-i}	log YW_{t-i}	log y_{t-i}
0	-116.482 (-2.382)	0.793 (2.507)	2.143 (2.479)	-0.528 (-0.734)
1		0.903 (2.608)	2.782 (2.735)	-0.827 (-1.025)
2		0.580 (2.546)	2.391 (2.765)	-0.928 (-1.656)
3		0.076 (0.389)	1.444 (1.653)	-0.865 (-1.927)
4		-0.356 (-1.174)	0.413 (0.401)	-0.668 (-1.037)
5		-0.465 (-1.611)	-0.226 (-.258)	-0.369 (-0.603)
Sum of lagged coefficients		1.530	8.949	-4.184
D.W.	1.581			
R^2	0.315			
SEE	0.181			

Note: The values in parentheses refer to t-statistics. SEE is the standard deviation of the regression. D.W. is the Durbin-Watson statistic.

TABLE 3-5 NON-COFFEE EXPORTS FUNCTIONS: ALMON LAGS

QUARTERLY DATA, 1971-1981

[Fourth Degree Polynomial, Far end Constraint]

Lag (i)	Constant	log REX_{t-i}	log YW_{t-i}	log y_{t-i}
0	-68.529 (-1.154)	2.647 (2.466)	1.706 (0.632)	-0.401 (-0.383)
1		0.079 (0.095)	1.815 (0.835)	-1.235 (-1.216)
2		-0.805 (-1.048)	2.325 (1.398)	-0.572 (-0.596)
3		-0.660 (-0.931)	2.249 (1.413)	0.452 (0.464)
4		-0.144 (-0.179)	0.602 (0.280)	0.702 (0.729)
5		0.088 (0.010)	-3.604 (-1.225)	-0.958 (-0.876)
Sum of lagged coefficients		1.206	5.093	-2.012
D.W.	1.736			
R^2	0.426			
SEE	0.182			

Note: Numbers in parentheses refer to t-statistics. SEE is the standard error of regression. D.W. is the Durbin-Watson statistic.

ANNEX 4

EXCHANGE RATE POLICY

The purpose of this annex is to investigate the effectiveness of a faster crawling peg compared with a step-wise devaluation in Colombia, using a simple partial equilibrium approach that emphasizes the role of real wages, expectations, intermediate goods and the interest rate in the behavior of the real exchange rate. The analysis provides support to the policy discussion in Chapter 2.

The Real Exchange Rate in a World of Floating Parities

Usually the real exchange rate (e) is defined as:

$$(4.1) \qquad e_t = \frac{E_t P_t^*}{P_t}$$

where

E_t = Nominal Pesos/U.S. rate in t
P_t^* = Price index in the U.S. in t
P_t = Price index in Colombia in t

However, this definition does not capture the fact that Colombia trades in a world of floating exchange rates among industrialized countries. Under these circumstances the real exchange rate should be ideally computed in terms of a basket of the currencies of Colombia's trade partners. The real basket exchange rate (b), then is given by:

$$(4.2) \qquad b_t = \frac{B_t PW_t}{P_t}$$

where B_t is an index of the nominal basket, and PW_t is the index of the price levels of Colombia's trade partners. Assuming that Colombia trades with k countries, B_t can be defined as:

$$(4.3) \qquad B_t = \sum_{i=1}^{k} \alpha_i E_{cit}$$

where α_i is the weight of country i, and E_{ci} is the exchange rate between the Colombian peso and country i's currency. Note that by triangular arbitrage:

$$(4.4) \qquad E_{ci} = E_{c1} E_{1i}, \quad i = 2,\ldots,k$$

where E_{c1} is the Colombian peso-U.S. dollar rate, and E_{1i} is the rate between the U.S. dollar and country i's currency (e.g., the US$/Yen Rate).

Then the rate of change of the nominal basket index B_t can be written as (where $\hat{X} = \frac{dX}{dt}\frac{1}{X}$):

$$(4.5) \qquad \hat{B} = \hat{E}_{cl} + \sum_{i=2}^{k} \left(\frac{\alpha_i E_{li}}{A} \right) \hat{E}_{li}$$

where $$A = \alpha_1 + \sum_{j=2}^{k} \alpha_j E_{lj}$$

Equation (4.5) indicates that in a world of floating rates the rate of change of the basket of nominal rates $\hat{B}$ will differ from the official rate of crawl of the peg $\hat{E}_{cl}$. In particular, if the U.S. dollar—the currency in terms of which the official peg is defined—is appreciating in the world market (i.e., $\sum_{i=2} (\alpha_i E_{li}/A) \hat{E}_{li} < 0$), the rate of depreciation of the basket will be smaller than the rate of change of the official peg. That is, $\hat{B} < \hat{E}_{cl}$. This has been the case in Colombia since the fourth quarter of 1980 when the U.S. dollar began appreciating in the world market.

Equation (4.2) was computed considering 8 countries and three alternative weights, viz. exports weights, import weights, and trade weights. The trade weighted index and the more traditional computation vis-a-vis the U.S. dollar were presented in the text.

Exchange Rate Adjustments, Real Wages and Competitiveness

This section presents a simple partial equilibrium model that investigates the relationship between exchange rate adjustments, real wages, expectations and competitiveness. In order to focus on the most important aspects of the problem a number of simplifying assumptions are made.

A Two Goods Model Without Money

The following notation is used:

P_t = domestic price of tradeables
P_n = domestic price of non-tradeables
a_{ji} = input-output coefficient between factor j and good i
E = nominal (basket) exchange rate
W = nominal wage rate
w = real wages
P = Price Index
g = real exchange rate
r_* = rental rate of capital (nominal)
P_t^* = world price of tradeables
τ = index of import tariffs and export taxes.

The model is given by equations (4.6) to (4.10)

$$(4.6) \qquad P_t = E\, P_t^* (1 + \tau)$$

$$P_n = a_{ln} W + a_{kn} r + a_{tn} P_t \tag{4.7}$$

$$w = W/P \tag{4.8}$$

$$P = p_t^{\alpha} p_n^{1-\alpha} \tag{4.9}$$

$$g = E P_t^{*} (1 + \tau)/P_n \tag{4.10}$$

The primary objective of the model is to investigate to what extent adjustments in the nominal exchange rate ($\hat{E}$) will help to improve the real exchange rate, specifically, the value of the elasticity $\hat{g}/\hat{E}$. The distinction between accelerating the peg (a higher $\hat{E}$) or a stepwise devaluation, will be investigated later.

The Simplest Case

From (1) we obtain:

$$\hat{P}_t = \hat{E} + \hat{P}_t^{*} + (1 + \tau) \tag{4.11}$$

Then, from (4.2):[1/]

$$\hat{P}_n = \lambda_{ln} \hat{W} + \lambda_{kn} \hat{r} + \lambda_{tn} \hat{P}_t \tag{4.12}$$

where λ_{in} is the share of input i in the cost of nontradable goods. Notice that:

$$\lambda_{ln} + \lambda_{kn} + \lambda_{tn} = 1 \tag{4.13}$$

Then assuming for the time being that

$$\hat{P}_t^{*} = (1 + \tau) = \hat{W} = \hat{r} = 0 \tag{4.14}$$

We obtain by replacing (4.11) in (4.12) that:

$$\hat{P}_n = (1 - \lambda_{ln} - \lambda_{kn}) \hat{E} \tag{4.15}$$

and, by using (4.10), the improvement of the real exchange rate, under the unrealistic assumptions given by (4.14), is found to be equal to:

$$\hat{g} = (1 - \lambda_{tn}) \hat{E} \tag{4.16}$$

1/ Notice that in (4.12) the following expression would also appear: $[\lambda_{LN} a_{LN} + \lambda_{KN} a_{LN} + \lambda_{TN} a_{TN}]$. However, to the extent that firms minimize costs this expression will be equal to zero. Also notice that in the derivation of (4.12) it has been assumed that there is no change in the productivity of labor. This, of course, is a simplifying assumption. On labor productivity in the industrial sector in Colombia see, for example, "El Sector Industrial en el Plan de Desarrollo Nacional," DNP, Bogota, March 1983.

This is a very intuitive expression tht says that even if nothing else happens, as a result of a devaluation, the real exchange rate will improve by less than the devaluation, if it can be assumed that the cost of nontradables has some component of tradable inputs.

Real Wages (Partially) Adjust

However, as already mentioned, expression (4.16) is very simple especially since it assumes that $\hat{W} = \hat{r} = 0$. That is, it assumes that after the devaluation the nominal returns to factors of production remain constant. In order to illustrate how the relaxation of these assumptions would affect the outcome of the model, assume that nominal wages will adjust by a percentage k of the rate of inflation.

$$\hat{W} = k\,\hat{P} \qquad (4.17)$$

where $0 < k < 1$

If $k = 0$ we obtain equation (4.16). If k 1, we have that as a consequence of inflation real wages will go down. If $k = 1$ real wages will be constant. (This could be the case of full indexation of wages, as in Chile 1975-1982). In general k will not be a constant but will depend on the conditions of the labor market (i.e., the existing rate of unemployment). However, in order to simplify the model we will assume a constant k.

Then, from (4.9), we know that:

$$\hat{P} = \alpha\,\hat{P}_t + (1-\alpha)\,\hat{P}_n \qquad (4.18)$$

but, assuming that $\hat{P}_t = \hat{E}$, and using (4.18) in (4.17), and the resulting expression in (4.12) we obtain:

$$\hat{P}_n = \frac{\lambda_{ln}\alpha k + \lambda_{tn}}{1 - \lambda_{ln} k(1-\alpha)}\,\hat{E} \qquad (4.19)$$

Logarithmically differentiating (4.10) and using (4.18) we obtain:

$$\hat{g} = \left(1 - \frac{[\lambda_{ln}\alpha k + \lambda_{tn}]}{1 - \lambda_{ln} k(1-\alpha)}\right)\hat{E} \qquad (4.20)$$

The expression in parentheses is smaller than one, showing that the improvement in the real exchange rate will be smaller than the devaluation. Furthermore, this expression $\left(1 - \frac{[\lambda_{ln}\alpha k + \lambda_{tn}]}{1 - \lambda_{ln} k(1-\alpha)}\right)\hat{E}$ is smaller than $(1 - \lambda_{tn})$, indicating that $\hat{g}$ in (4.20) is smaller than $\hat{g}$ in (4.16). Equation (4.20) can be written as:

$$\hat{g} = \left(\frac{1 - \lambda_{ln} k - \lambda_{tn}}{1 - \lambda_{ln} k(1-\alpha)}\right)\hat{E} \qquad (4.21)$$

From here it is easy to verify that if $k = 1$ (real wages constant), and $\lambda_{tn} = 0$ (capital is not used in the production of nontradables), $\hat{g} = 0$.

This is the case of super-neutrality of a devaluation, where independently of the magnitude of the nominal devaluation, the real exchange rate does not change. Notice however, that the assumptions required to obtain this superneutrality are very strong.

The General Case

Finally, assume that $\hat{r}$ (i.e., the nominal rental rate of capital) also reacts to the devaluation. Theoretically, r is equal to

$$r = (i + \delta - \hat{P}_k^e) P_k \tag{4.22}$$

where i is the nominal interest rate, δ is the rate of depreciation, $\hat{P}_k^e$ is the expected rate of change in the price of capital goods and P_k is the actual price of capital goods. Assuming that capital goods (i.e., machines) are treadable, and choosing the right dimensions P_k can be replaced by P_t in (4.22).

Then, logarithmically differentiating (4.22) we obtain

$$\hat{r} = \gamma_0 \hat{i} + \gamma_1 \hat{\delta} - \gamma_2 \hat{P}_t^e + \hat{P}_t \tag{4.23}$$

where $\gamma_0 = i/(i + \delta - \hat{P}_t^e)$; $\gamma_1 = \delta/(i + \delta - \hat{P}_t^e)$; $\gamma_2 = \hat{P}_t^e/(i + \delta - \hat{P}_t^e)$. And where $\hat{P}_t^e$ is the change in the expected rate of change of the domestic price of tradables.

The analysis of (4.23) is very important, since the actual magnitude of r will depend on whether $\hat{E}$ is achieved by accelerating the rate of depreciation of the crawling peg, or if it is attained by a stepwise maxi (or midi) devaluation.

Assuming that there is some connection between the Colombian and the world capital markets we have that:

$$i = i^* + \hat{E}^e + R \tag{4.24}$$

where i^* is the world investment rate, $\hat{E}^e$ is the expected rate of devaluation, and R is a country-risk premium.

Then, applying the $\wedge$ operator to (4.24) and assuming that $\hat{i}^* = \hat{R} = 0$ we obtain

$$\hat{i} = (\hat{\hat{E}}^e) \tag{4.25}$$

This says the domestic nominal interest rate will increase by the change in the expected rate of depreciation. If the Colombian authorities try to attain the increase in g by accelerating the rate of the crawl, then $(\hat{\hat{E}}^e) > 0$ and $\hat{i} > 0$. On the other hand if this objective (increase of g) is pursued by a once-and-for-all maxidevaluation, it is possible that the expected rate of depreciation will not increase. However, if the public does not perceive the magnitude of the devaluation as adequate, $(\hat{\hat{E}}^e)$ could still be positive. This was indeed the case in the southern-cone countries in the early 1980s.

Using (4.25) in (4.23), assuming that $\hat{\hat{P}}_t^e = (E^e)$ and that $\hat{P}_t = \hat{E}$, and using the expressions required to solve for $\hat{g}$ we obtain:

$$(4.26) \qquad \hat{P}_n = \frac{(\lambda_{1n}k\alpha + \lambda_{kn} + \lambda_{tn})}{1 - k(1-\alpha)\lambda_{1n}} \hat{E} + \frac{\lambda_{kn}(\gamma_0 - \gamma_2)(\hat{\hat{E}}^e)}{1 - k(1-\alpha)\lambda_{1n}}$$

and from (4.10) we get

$$(4.27) \qquad \hat{g} = \left(1 - \left[\frac{\lambda_{1n}k\alpha + (1-\lambda_{1n}) + \lambda_{kn}(\gamma_0 - \gamma_1)\varepsilon}{1 - k(1-\alpha)\lambda_{1n}}\right]\right)\hat{E}$$

where ε is the elasticity of the expected rate of devaluation with respect to the actual rate of devaluation, i.e., $\varepsilon = (\hat{E}^e)/\hat{E}$. Assuming that $\gamma_0 - \gamma_1$ and that $\varepsilon \geq 0$, expression (4.27) is smaller than (4.20), indicating that when the prices of all factors and inputs are allowed to adjust to clear changes in E, the change in the real exchange rate is smaller than obtained when some of these prices are held constant.

ANNEX 5

BEHAVIOR OF CAT [1/]

CAT Rates

The Certificados de Abono Tributario (CATs) have been one of the most important tools of Colombia's export incentives scheme. Their rates have varied through time, having significantly increased in 1983-84. Tables 5-1 and 5-2 present data on the CAT's rates for 1978, 1981 and 1983 prior to the August increase. While Table 5-1 contains data at the position level, Table 5-2 presents aggregated data at the section level. The data at the section level was constructed as weighted averages from the data in Table 5-1, where the weights were taken from the relative importance of each chapter in total exports in 1980. Table 2.4 in the text contains data for the overall weighted average of CAT's rates. There has been a substantial increase in the CAT's rates according to these tables. In addition, the August 1983 reform raised CAT to 20% for 265 products; in 1984 these rates were further increased through CERT.

CATs and the Degree of Competitiveness

As discussed in Chapter 2, the recent increase in the level of CAT's rates responds to the idea of partially compensating for the recent real appreciation of the peso. An important question, then, is to what extent has this been achieved? Assume, in order to simplify the analysis, that the real effective exchange rate for export (E_j) will be given by equation (5.1).

$$E_j = \ell_j (1+CAT_j)(1+PREX_j)(1+PU_j) \tag{5.1}$$

where:

ℓ_j = real exchange rate (5.2)

CAT_j = rate of CAT subsidy

$PREX_j$ = implicit PROEXPO subsidy

PV_j = implicit Plan Vallejo subsidy.

In order to investigate the extent to which the increase in the CAT rates has compensated for the real appreciation of the peso, assume that $PREX_j$ and PV_j are constant. Then:

$$\hat{E}_j = \hat{\ell}_j + (1+CAT_j)$$

where $\hat{X} = \frac{dX}{dt}\frac{1}{X}$

Considering the aggregate weighted averages of CAT's [Table 2-4] we obtain $(1+CAT_j) = 7.36\%$, [(1.1134 - 1.0370)/1.0370 = 1.0736]. This figure, clearly, is below any of the estimates of the degree of real appreciation of the peso presented in Table 2-3, suggesting that the recent increases in the CAT rates have fallen short of compensating the real appreciation of the peso.

1/ As mentioned in Volume I, CAT has been replaced by CERT in 1984; this does not, however, basically affect the analysis.

Table 5-1 CAT SUBSIDIES 1978, 1981 AND 1983

(percentage)

Tariff Chapter Number	1978		1981		1983	
	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
1	1.0	0.0	0.0	0.0	0.0	0.0
2	4.1	1.7	5.0	0.0	15.0	0.0
3	5.0	0.0	9.0	0.0	14.3	3.2
4	1.3	1.5	0.3	1.7	0.6	2.9
5	4.7	1.1	0.0	0.0	0.0	0.0
6	1.0	0.0	0.0	0.0	4.0	6.5
7	4.0	3.7	3.6	4.1	3.8	6.5
8	11.9	1.0	11.9	1.0	14.9	0.7
9	2.0	1.9	1.2	2.2	11.5	6.5
10	2.6	2.0	2.8	2.5	5.6	7.4
11	2.4	3.1	0.7	1.8	2.7	5.9
12	2.3	1.9	1.8	2.4	1.7	4.8
13	9.0	0.0	0.7	2.5	1.1	4.0
14	1.0	0.0	0.0	0.0	0.0	
15	2.0	1.8	0.3	1.3	0.5	2.7
16	9.0	0.0	12.0	0.0	15.0	0.0
17	3.4	4.7	2.6	5.1	3.1	5.9
18	1.6	1.9	2.0	3.6	.4	8.0
19	1.7	2.4	9.4	1.3	15.0	0.0
20	12.0	0.0	12.0	0.0	15.0	0.0
21	11.6	2.3	11.6	2.3	15.0	0.0
22	9.0	0.0	12.0	0.0	15.0	0.0
23	1.0	0.0	0.0	0.0	0.0	0.0
24	7.3	2.1	9.0	0.0	15.0	0.0
25	1.2	0.9	0.3	1.1	2.2	5.3
26	1.5	1.4	1.0	2.1	3.1	6.2
27	0.4	0.5	0.6	1.6	0.5	1.5
28	5.0	0.0	0.6	1.7	1.6	4.6
29	5.0	0.0	5.0	0.0	15.0	0.0
30	1.0	0.0	0.0	0.0	0.7	3.1
31	5.0	0.0	0.2	0.9	1.0	3.9
32	9.0	0.0	5.0	0.0	15.0	0.0
33	4.7	0.0	9.0	0.0	15.0	0.0
34	9.0	4.1	9.0	0.0	15.0	0.0
35	9.0	0.0	9.0	0.0	15.0	0.0
36	9.0	0.0	9.0	0.0	15.0	0.0
37	9.0	0.0	9.0	0.0	15.0	0.0
38	5.0	0.0	8.6	1.9	14.5	2.6
39	5.9	1.7	5.9	1.7	15.0	0.0
40	1.3	1.1	9.0	4.1	14.6	2.6

Tariff Chapter Number	1978		1981		1983	
	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
41	1.3	1.6	0.4	1.8	1.3	3.8
42	12.0	0.0	12.0	0.0	15.0	0.0
43	2.8	4.5	2.8	4.5	0.0	0.0
44	9.4	5.6	4.9	4.3	8.7	7.5
45	7.7	3.1	9.0	0.0	15.0	0.0
46	12.0	0.0	12.0	0.0	15.0	0.0
47	1.0	0.0	0.0	0.0	0.0	0.0
48	4.0	4.0	6.4	2.0	14.9	1.0
49	1.5	1.1	12.0	0.0	15.0	0.0
50	6.0	4.1	0.0	0.0	0.0	0.0
51	4.9	1.8	5.3	1.1	15.0	0.0
52	1.0	0.0	0.0	0.0	0.0	0.0
53	8.1	3.9	3.3	4.4	5.4	7.3
54	4.0	0.0	0.0	0.0	0.0	0.0
55	4.0	1.7	8.1	1.7	15.0	0.0
56	12.0	2.7	3.6	3.0	9.6	7.2
57	9.0	4.5	3.3	5.0	9.6	7.3
58	12.0	0.0	12.0	0.0	15.0	0.0
59	9.0	0.0	9.0	0.0	15.0	0.0
60	12.0	0.0	12.0	0.0	15.0	0.0
61	12.0	0.0	12.0	0.0	15.0	0.0
62	12.0	0.0	12.0	0.0	15.0	0.0
63	1.0	0.0	6.0	8.5	7.5	10.6
64	12.0	0.0	12.0	0.0	15.0	0.0
65	12.0	0.0	12.0	0.0	15.0	0.0
66	12.0	0.0	12.0	0.0	15.0	0.0
67	9.3	5.5	9.3	5.5	11.3	7.5
68	11.5	1.4	11.5	1.4	15.0	0.0
69	11.6	1.0	11.8	0.9	14.4	3.0
70	9.5	3.9	9.8	4.1	15.0	0.0
71	1.0	0.0	0.4	1.4	0.4	2.5
72	1.0	0.0	5.0	0.0	15.0	0.0
73	6.1	4.7	6.0	5.0	8.9	7.4
74	6.3	4.8	5.9	5.2	9.0	7.4
75	3.5	3.9	2.8	4.3	5.5	7.6
76	88	4.9	8.5	5.3	17.8	5.4
77	0.9	0.4	0.0	0.0	3.8	6.9
78	3.3	3.9	2.6	4.3	0.0	0.0
79	1.9	3.3	2.2	4.0	6.0	7.8
80	4.5	4.9	3.9	5.4	6.0	7.6

Tariff Chapter Number	1978		1981		1983	
	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
81	1.0	0.0	0.0	0.0	0.0	0.0
82	12.0	0.0	12.0	0.0	15.0	0.0
83	12.0	0.0	12.0	0.0	15.0	0.0
84	12.0	0.0	12.0	0.0	15.0	0.0
85	11.7	1.1	12.0	0.0	15.0	0.0
86	11.1	1.4	11.1	1.4	15.0	0.0
87	7.3	5.3	12.0	0.0	15.0	0.0
88	0.0	0.0	9.0	0.0	15.0	0.0
89	4.3	4.9	10.3	3.7	0.75	1.8
90	9.9	0.0	12.0	0.0	15.0	0.0
91	9.9	0.0	9.0	0.0	15.0	0.0
92	10.4	3.0	10.4	3.0	15.0	0.0
93	9.0	0.0	9.0	0.0	15.0	0.0
94	9.0	0.0	10.2	1.5	15.0	0.0
95	12.0	0.0	12.0	0.0	15.0	0.0
96	12.0	0.0	12.0	0.0	15.0	0.0
97	12.0	0.0	12.0	0.0	15.0	0.0
98	10.2	1.4	12.0	0.0	15.0	0.0
99	0.9	0.4	0.0	0.0	0.0	0.0

Source: Constructed from DNP data.

TABLE 5-2: WEIGHTED AVERAGE CAT SUBSIDIES

1978-1983

(Percent)

Section	Chapters	1978	1981	1983
1	1-5	3.77	5.58	10.94
2	6-14	2.39	1.61	11.29
3	15	2.00	.30	.50
4	16-24	10.05	8.87	13.79
5	25-27	.63	.54	1.00
6	28-38	5.11	4.76	10.53
7	39-40	4.93	6.55	14.92
8	41-43	9.97	9.80	12.40
9	44-46	9.77	6.61	9.71
10	47-49	2.63	9.48	14.96
11	50-63	8.81	10.21	14.95
12	64-67	11.97	11.97	14.96
13	68-70	10.52	10.74	14.78
14	71-72	1.00	.40	.40
15	73-83	8.72	8.64	11.79
16	84-85	11.93	11.70	14.86
17	86-89	6.69	11.70	14.86
18	90-92	9.96	11.82	15.00
19	93	9.00	9.00	15.00
20	94-98	10.60	11.51	15.00
21	99	.90	.00	.00

Source: Constructed from DNP data.

ANNEX 6

RATE OF DEVALUATION, MONEY AND THE INTEREST RATE

Introduction

Recently the real interest rate in Colombia, as in many other countries, has been "high", which has been a matter of concern for the Colombian authorities trying to bring about an economic recovery. Colombia is a semi-open economy, with a growing, but still partially repressed, capital market.[1/] The behavior of the interest rate in Colombia therefore cannot be fully explained by conventional models assuming a fully open or completely closed economy. This annex derives a model for analyzing interest rate determination in a small semi-open economy, and empirically tests it using quarterly data for 1968-1982.

This analysis should be useful for evaluating two key policy questions addressed in Chapter 2. First, the model directly addresses the question of the relationship between the rate of devaluation and the nominal interest rate. This is especially important at the present time, since as a result of the recent real appreciation of the peso a number of observers have recommended an acceleration of the rate of devaluation of the Colombian crawling peg [see, for example, FEDESARROLLO (1983), Ocampo (1983), IBRD (1983)]. The analysis presented in this Annex, will be useful in determining the effect of a faster rate of crawling on the nominal interest rate. Second, the model will also be helpful in determining the effect of monetary policy on the rate of interest. In particular, this analysis will help to determine the effects of possible modifications to the present monetary policy on the interest rate.

Interest Rate, Rate of Devaluation and Money

In a fully open economy where economic agents are risk neutral and foreign and domestic bonds are perfect substitutes, the internal and external interest rates are rigidly linked through the interest parity condition[2/]:

$$(6.1) \qquad i_t = i^w_t + D^e_t$$

1/ On the behavior of the Colombia capital market see IBRD Report No. 4444, Chapter V. See also J.C. Jaramillo , "El Proceso de Liberacion del Mercado Financiero" in Ensayos de Politica Economicas, 1982.

2/ This expression abstracts from taxation considerations.

where

i_t = domestic nominal interest rate
i^w_t = foreign (world) nominal interest rate, on instruments that have the same maturity as the domestic papers
D^e_t = expected rate of devaluation of the domestic currency between period t and the period corresponding to the maturity of the corresponding financial instruments. The subscript t, indicates that this expectation is formed in period t.

If in the economy in question there are no impediments to capital movements, equation (6.1) will tend to hold both in the short- and in the long-run. The empirical evidence available suggests that a slightly revised version of equation (6.1)--which replaces D^e by the forward premium, incorporates transaction costs, and considers off-shore interest rates--holds closely for the case of industrialized countries.3/

In the case of semi-open or closed economies expression (6.1), however, clearly does not seem to hold. Quite on the contrary, the recent experience of the Southern-cone countries (Argentina, Chile, Uruguay) suggests that in semi-industrialized, semi-open economies the divergencies from (6.1) can be very substantial.4/ The case of Colombia also shows deviations from equation (6.1)5/

Equation (6.1) can be modified in several ways, in order to incorporate the fact that we are dealing with a semi-open economy. In particular, it is possible to write an expression that indicates that the domestic interest rate tends to equate the world rate of interest rates plus the rate of devaluation and a risk premium in the long-run, but that it can differ from it in the short-run. First define i^*_t as:

$$(6.2) \qquad i^*_t = i^w_t + D^e_t + \beta_t$$

where β_t is a risk-premium term.6/ Equation (6.1) can then be replaced by the following expression:

3/ See J. Frenkel and R. Levich, "Covered Interest Arbitraje: Unexpected Profits", Journal of Political Economy, April 1975; and "Transaction Costs and Interest Arbitraje: Tranquil versus Turbulent Periods", Journal of Political Economy, December 1977.

4/ See, for example, Edwards, op. cit.

5/ See World Bank Report No. 4444-CO.

6/ On the existence of a risk-premium in interest arbitrage equations see, for example, H. Hansen and R. Hodrick, "Forward Exchange Rates as Optimal Predictors of Future Spot Rates: An Econometric Analysis," Journal of Political Economy, October 1980.

$$(6.3) \qquad \Delta i_t = \theta[i_t^* - i_{t-1}]$$

where $0 < \theta < 1$. This equation states that movements of the domestic (nominal) interest rate will respond to discrepancies between i_t^* and the domestic rate in the previous period. According to (6.3), in the long-run the domestic interest rate will be equal to the foreign rate, plus the expected devaluation and the risk premium. In the short-run, however, these two rates (i_t and i_t^*) can differ. The coefficient θ is a measure of the speed at which discrepancies between i_t^* and i_{t-1} will tend to be connected. For example, if it only takes one period for these interest rates differentials to disappear, θ would be equal to 1.0.

Even though equation (6.3) captures an important characteristic of a semi-open economy--the fact that it takes time for the interest parity condition to hold--it does not allow for domestic monetary policy to play any role in the behavior of the domestic interest rate. In a semi-open economy, however, where capital movements are subject to a number of controls, it is conceivable that domestic monetary policy will have some effect on the short run behavior of the interest rate.7/ Specifically, it can be postulated that disequilibria in the money market will have an effect on interest rates movements, with situations of excess liquidity--an excess supply for money--driving the interest rate down, (i.e., a liquidity effect), and with excess demands for money resulting in an increase in the domestic interest rate. This possible role of the conditions prevailing in the domestic money market on interest rate behavior in a semi-open economy can be captured by the following expression:

$$(6.4) \qquad \Delta i_t = \theta[i_t^* - i_{t-1}] - \lambda[\log m_t - \log m_{t-1}^d]$$

where m_t is the real quantity of money in t, and where m_{t-1} is the quantity of money demanded in period t. This equation differs from equation (6.3) in that it explicitly allows for internal monetary disequilibria to affect interest rates movements. The parameter λ measures the importance of these disequilibria, and the negative sign reflects the hypothesis that an excess supply (demand) for real money will generate a decline (increase) in the interest rate.

In Equation (6.4) the monetary disequilibrium term is written as the discrepancy between the actual quantity of money in t, and the quantity of money demanded in t-1. However, an alternative way to write this term would include the contemporaneous value of both the quantity of money and the quantity demanded. In this case the interest rate equation can be rewritten as:

$$(6.5) \qquad \Delta i_t = \theta[i_t^* - t_{t-1}] - \lambda[\log m_t - \log m_t^d]$$

Equations (6.3), (6.4) and (6.5) are our three basic formulations for the behavior of interest rates in a small semi-open economy. In the next section these equations are estimated using Colombian quarterly data for 1968-1982.

7/ On capital movement controls in Colombia see the recent issues of the IMF Annual Report on Exchange Arrangements and Exchange Restrictions.

Estimation

In this section results obtained from the estimation of reduced forms for equations (6.3) through (6.5) for Colombia using quarterly data for 1968-1982 are presented. Before proceeding with the estimation it is necessary to define a proxy for D_t^e--the expected rate of devaluation formed in t. In order to simplify the analysis it is assumed that D_t^e is equal to the actual (annualized) rate of devaluation in quarter t. This is a plausible assumption, since during the period under consideration Colombia followed a crawling peg exchange rate policy, where the rate of the crawl was altered fairly slowly.8/,9/ On the other hand, regarding the risk premium (B_t) it was assumed that it had been constant throughout the period.

Regarding the demand for money function, it was assumed that it has a conventional Cagan form:

$$(6.6) \qquad \log m_t^d = b_o + b_1 \log y_t - b_2 i_t$$

for y_t = real income.

Estimation of Equation (6.3)

Equation (6.3) can be rewritten in the following form (where ε_t is an error term with the usual characteristics).

$$(6.7) \qquad i_t = \alpha_o + \alpha_1 i_t^* + \alpha_2 i_{t-1} + \varepsilon_t$$

Notice that since $\alpha_1 = \theta$ and $\alpha_2 = (1-\theta)$, θ is overidentified. Equation (6.7), however, was run without imposing the constraint $\alpha_1 = 1 - \alpha_2$. The results obtained was the following, where the values in parentheses are t-statistics.(All the data was obtained from Montes and Candelo (1982), DNP and the IMF.)

$$(6.8) \qquad i_t = \underset{(0.484)}{0.011} + \underset{(1.671)}{0.321}\, i_t^* + \underset{(7.261)}{0.765}\, i_{t-1}$$

$R^2 = 0.768$

D.W. = 2.422

N = 58

8/ For a description of Colombia's exchange rate policy see IBRD Report No. 4444-CO. See also E. Weisner, See also Weisner, "Devaluacion y Mecanismo de Ajuste en Colombia," Politica Economia Externa Colombia, Bogota, 1978.

9/ In order to check the extent to which past rates of devaluation predicted the actual rate of devaluation a regression of the following form using quarterly data was run:

$$D_t = a_1 D_{t-1} + a_2 D_{t-2} + u_t$$

For 1968-1982 the following result, which indicates that the assumption $D_t = D_t$ is a fairly good one, was obtained (t-statistics in parentheses):

$$D_t = \underset{(15.318)}{0.928}\, D_{t-1} + \underset{(0.010)}{0.001}\, D_{t-2} \qquad \text{D.W.} = 2.2$$

The coefficients of i_t^* and i_{t-1} are significant at the conventional levels. As may be seen the direct estimate of θ is 0.321, indicating that approximately one-third of the discrepancy between i_t^* and i_{t-1} is eliminated in one quarter. This means that after one year an interest rate differential of 10 percentage points would be reduced to 2.1 percentage points. This coefficient can also be interpreted as measuring the effects of an increase on the rate of devaluation or the interest rate.

The indirect estimation of θ--as one minus the coefficient of i_{t-1}--gives a value of 0.235, suggesting a slightly slower speed at which discrepancies between i_t^* and i_{t-1} will be eliminated.

Estimation of Equation (6.4)

Combining (6.6) and (6.4), and adding an error term w_t, the following reduced form of equation (6.4) can be written:

$$(6.9) \qquad i_t = \gamma_0 + \gamma_1 i_t^* + \gamma_2 i_{t-1} + \gamma_3 \log m_t + \gamma_4 \log y_{t-1} + w_t$$

where it is expected that $\gamma_1 > 0$, $\gamma_2 > 0$, $\gamma_3 < 0$, and $\gamma_4 > 0$. The expressions for the γ's in terms of the structural equations [(6.4) and (6.6)] parameters are:

$$\gamma_1 = \theta$$

$$\gamma_2 = 1 - \theta + \lambda b_2$$

$$\gamma_3 = -\lambda$$

$$\gamma_4 = \lambda b_1$$

The estimation of (6.9) using OLS yielded the following result for period 1968-III - 1982-IV (t-statistics in parenthesis):

$$(6.10) \qquad \underset{}{i_t} = \underset{(-1.990)}{-0.489} + \underset{(2.337)}{0.404}\, i_t^* + \underset{(2.847)}{0.383}\, i_{t-1}$$

$$(6.10) \qquad \underset{(-1.963)}{-0.275} \log m_t + \underset{(3.539)}{0.379} \log y_{t-1}$$

$$R^2 = 0.815$$

$$D.W. = 2.211$$

$$N = 58$$

This result is very satisfactory, with all the coefficients being significant at conventional levels and having the expected signs. The estimated structure coefficients computed from (6.10) turn out to be the following:

$\hat{\theta} = 0.404$

$\hat{\lambda} = 0.275$

$\hat{a}_1 = 1.378$

$\hat{a}_2 = 0.775$

As may be seen, the estimated parameters for the demand for money in Colombia are within the plausible range of values.[10/] Also, these results indicate that after one-quarter 40% of a unitary uncovered interest rate differential will be corrected. After one year, 87% of this discrepancy will be corrected.

The coefficient of $i_t^* (\hat{\theta})$ can also be used to simulate the effect of an increase in the rate of devaluation on the interest rate. Assume that the initial (in period 0) domestic interest rate is 40% and that the rate of devaluation is 22% per annum. Assume now that in period 1 the rate of devaluation is increased to 32%, and maintained at this higher level, with all the rest of the relevant variables remaining constant. The evolution of the domestic interest rate under this case, using the estimated parameters from equation (6.10) is given in Table 6.1.

As may be seen from this table, the empirical results presented in equation (6.10) suggest a fairly high speed of adjustment of the domestic interest rate to a higher rate of devaluation (this, of course, assumes that the actual rate of devaluation captures the expected rate of devaluation): after six quarters the domestic rate of interest has practically reached its new equilibrium.

Equation (6.10) also provides some information regarding the role of the quantity of money on interest rate behavior--specifically, this estimate provides a semi-elasticity of the interest rates with respect to real money of -0.275. The corresponding elasticity, of course, will be variable and will depend on the level of the interest rate. In Table 6.2 the corresponding elasticities for some initial values of the nominal interest rate are given.

From Table 6.2 it may be seen that for the case of a 40% nominal interest rate the corresponding elasticity will be -0.688, indicating that with other things given an increase in the real quantity of money of 10% will reduce the nominal interest rate by 6.9%. However, from a policy perspective this result should be interpreted with caution. The problem, of course, is that according to our model in order to reduce the interest rate it is necessary to increase the real quantity of money. That is, we require an increase in the rate of growth of nominal money that will not be matched by higher equiproportional inflation.

10/ In a recent study Montes and Candelo op cit estimated that for the period 1968-1980 the elasticity of the demand for money with respect to real income was 0.955, and that the interest rate elasticity of the demand for money was -0.20.

Table 6-1 SIMULATION OF THE EFFECT OF A HIGHER RATE OF DEVALUATION OF THE CRAWLING PEG ON THE DOMESTIC INTEREST RATE

Quarter	Nominal Domestic Interest Rate (i)	Rate of Devaluation
0	40.0%	22%
1	44.0%	32%
2	46.5%	32%
3	47.9%	32%
4	48.7%	32%
5	49.2%	32%
6	49.5%	32%
7	49.7%	32%
8	49.8%	32%

Table 6-2. INTEREST RATE ELASTICITY WITH RESPECT TO REAL MONEY

Interest Rate Level	Interest Rate Elasticity With Respect to Real Money
30%	-0.917
35%	-0.786
40%	-0.688
45%	-0.611
50%	-0.550

In order to investigate the level of significance of the structural coefficients from the demand for money, equation (6.9) was estimated using a nonlinear least squares procedure that imposes the respective restrictions across coefficients. The following results were obtained: a_1 had an estimated value of 1.380 with a t-statistic of 1.963, and a_2 was estimated at 0.773 with a t-statistic equal to 1.368.

Estimation of Equation (6.5)

The reduced form of equation (6.5), with an error term (v_t) added, has the following form:

$$i_t = \delta_o + \delta_1 i_t^* + \delta_2 i_{t-1} + \delta_3 \log m_t + \delta_4 \log y_t + v_t \quad (6.11)$$

This expression differs from (6.10) in that log y now enters contemporaneously. The interpretation of the δ's in terms of the structural parameters, however, is quite different.

$$\delta_1 = \frac{\theta}{1+\lambda a_2}$$

$$\delta_2 = \frac{1-\theta}{1+\lambda a_2}$$

$$\delta_3 = \frac{-\lambda}{1+\lambda a_2}$$

$$\delta_4 = \frac{\lambda a_1}{1+\lambda a_2}$$

In this case it is expected, as before, that $\delta_1 > 0$, $\delta_2 > 0$, $\delta_3 < 0$ and $\delta_4 > 0$. The estimation of (6.11) using OLS for 1968 III to 1982 IV generated the following result, where the numbers in parentheses are the t-statistics:

$$(6.12) \quad i_t = \underset{(-1.832)}{-0.434} + \underset{(2.405)}{0.402}\, i_t^* + \underset{(2.845)}{0.363}\, i_{t-1} - \underset{(-2.536)}{0.389} \log m_t + \underset{(4.171)}{0.171} \log y_t$$

$$R = 0.840$$
$$D.W. = 2.112$$
$$N = 58$$

As may be seen, once again all the coefficients have the expected signs, and now their level of significance is even higher than before. The computed structural parameters are:

$$\hat{\theta} = 0.525$$

$$\hat{\lambda} = 0.298$$

$$\hat{a}_1 = 1.175$$

$$\hat{a}_2 = 0.785$$

As may be seen, these numbers are quite similar from those obtained from the estimation of equation (6.10). However, now the speed at which discrepancies between i_t and i_{t-1} is eliminated faster. Actually, these results indicate that, with other things given, in one quater more than one-half of a unitary interest rate differential will be corrected.

Also, according to these results, an increase in the rate of devaluation of the crawling peg of 10 percentage points (i.e., from 22% to 32%) will produce, in the first quarter, an increase in the domestic interest rate of 5.3 percentage points. After two quarters the domestic interest rate would have increased by 7.7 percentage points, and after one year the domestic interest rate will be higher in 9.5 percentage points.

Regarding the estimated coefficient of $\log m_t$ (-0.298), it indicates that with a 35% nominal interest rate, the elasticity of the interest rate with respect to the real quantity of money will be equal to -0.851. This means that, with other things given, an increase of the real quantity of money of 10% will tend to reduce, in the short-run, the interest rate to 26.5%.

Forecasting the Interest Rate

In order to further compare the relative merits of the three interest rates models tested [equations (6.3) through (6.5)], their forecasting properties are analyzed by re-estimating the models for a shorter period of time (1968 III - 1980 IV), and by using the estimated coefficients to make out-of-sample estimates for the seven quarters 1981 I and 1982 IV. Table 6.4 presents the actual values of the interest for this period, and the forecasted values obtained from each equation. Table 6.5, on the other hand, presents a number of statistics that measure the degree of accuracy of these forecasts. As in Table 6.3, for many of the quarters involved the forecasted interest rates are quite different from the actual values. However, it is important to consider that this is an out-of-sample experiment, and that during the period over which the forecast was done interest rates were particularly volatile.[11/]

In order to have a more systematic evaluation of the statistical quality of these forecasts Table 6.4 contains some summary statistics, from the comparison of actual and forecasted values. As may be seen these statistics actually indicate that these forecasts are quite satisfactory. The coefficients of correlation between actual and predicted series are fairly high, with the mean errors and Theil's (1961) inequality coefficient being on the low side. However, from these results, it is not straightforward to determine which equation provides better forecasts. While some statistics (root mean square error, mean-error, and Theil's inequality coefficient) suggest that equation (6.3)--which excludes monetary considerations--does a better job in forecasting the interest rate, other statistics (mean absolute error, and the correlation coefficient) point towards equations (6.5) and (6.4), respectively, as providing better forecasts.

11/ Unfortunately out-of-sample forecasts are not usually done. Most studies usually report forecasts made within the sample, which don not have too much value.

Table 6.3 ACTUAL AND OUT-OF-SAMPLE FORECASTED VALUES OF THE INTEREST RATE IN COLOMBIA; 1981 II - 1982 IV (%)

	Actual	Equation (6.3) Forecast	Equation (6.4) Forecast	Equation (6.5) Forecasts
1981 I	36.7	-	-	-
1981 II	60.9	35.4	40.1	40.6
1981 III	48.6	54.5	48.4	50.0
1981 IV	63.7	45.1	43.7	43.8
1982 I	65.7	56.3	45.4	46.2
1982 II	49.5	57.7	48.7	50.0
1982 III	53.8	45.0	44.4	45.7
1982 IV	57.2	49.0	44.8	44.9

Table 6.4 SUMMARY STATISTICS FOR COMPARISON OF ACTUAL AND PREDICTED INTEREST RATES SERIES: OUT OF SAMPLE FORECASTS 1981 II - 1982 IV

	Equation (4)	Equation (3)	Equation (5)
Correlation Coefficient Between Actual and Predicted	0.671	0.604	0.656
Root Mean Square Error	0.188	0.183	0.186
Mean Absolute Error	0.151	0.152	0.148
Mean Error	0.151	0.116	0.144
Theil's U-statistic	0.193	0.180	0.189
Fraction of Error Due to Bias	0.641	0.404	0.601
Fraction of Error Due to Different Variation	0.109	0.225	0.124
Fraction of Error Due to Different Covariation	0.250	0.371	0.276

Conclusión

This annex examined the behavior of the interest rate in Colombia. The analysis recognized that Colombia is a semi-open economy, and that, as a consequence, open economy and/or closed economy models are inappropriate. Three alternative formulations for the determination of the interest rate in a semi-open economy were developed and tested using quarterly data for 1968-1982. The results obtained were remarkably good, and indicated that: (1) the domestic (nominal) interest rate will tend to converge slowly through time towards the world interest rate plus expected devaluation. The estimates indicate that in one quarter, between one-third and one-half of a

unitary discrepancy between the domestic rate and the world rate plus the expected rate of devaluation will be corrected.12/ In six quarters an acceleration of the rate of devaluation of the crawling peg, will be almost completely translated into an equivalent increase in the domestic rate of interest. An excess supply for (real) money will exercise significant negative pressures on the nominal interest rate (i.e., there is a liquidity effect). Finally, out-of-sample forecasts using the three alternative formulations were presented. The results showed that despite being out-of-sample, the forecasts were quite satisfactory.

12/ It is interesting to note that the speed of adjustment found for Colombia is slightly higher than that found by M. Darby and A. Stockman,"The Mark III International Transmission Model: Specification", in M. Darby, et.al., The International Transmission of Inflation, (Chicago: University of Chicago Press, 1983) using a similar model, for the industrialized countries.

ANNEX 7

COLOMBIAN IMPORT LICENSE SYSTEM: TOWARDS GREATER EFFICIENCY

After years of pursuing mild liberalization in the external sector, Colombia has increased trade restrictions recently, particularly with respect to the imports licenses system. In late 1982 and early 1983 a large number of items have been moved from the Free Imports List to the Prior Licenses List. From the point of view of long-term economic efficiency it would appear that a gradual lowering of these restrictions over time would be desirable, reducing both the level of trade impediments and lowering its dispersion. Such a process of liberalization might be implemented as the present problem of the real appreciation of the peso is solved and the external sector begins to recover.

Even if a liberalization of the external sector can take place only gradually, the efficiency of existing restrictions might, nevertheless, be improved within a constraint that some degree of protection is to be maintained in the short term. A weakness of the present system is that it relies heavily on quantitative restrictions imposed in the form of import licenses, which are allocated to users in fairly arbitrary ways. In principle, a more desirable alternative would be to replace licenses by protective devices relying on the price mechanism, such as production subsidies. If, for fiscal or other reasons, such subsidies are not feasible or desirable, experts generally recommend the use of tariffs instead of licenses.[1/]

An important consideration, however, is related to the inherent permanence of one system relative to another. If the increase in the level of restrictions to trade are meant to be temporary. it would be important to use restrictive instruments that are easier to remove later. In Colombia, there are some indications that it might be easier to reform (i.e. reduce) the licenses system, than the tariff restrictions.

If on the grounds of their relative temporary nature, it is decided that at least in the short-run licenses are to be used, a serious effort should be made to improve the efficiency in their use. Two measures might be available for this purpose: (i) licenses could be allocated in a way that reflects economic agents' willingness to pay for them; a fairly straightforward way of doing that is by auctioning the licenses; (ii) the resale of licenses in the free market might be allowed.

Auctioning of licenses has important advantages. At present agents that receive the licenses succeed in obtaining high economic rents associated with the ownership of the licences. Thus, in addition to the efficiency costs associated with licensing, some distributive effects also result. On the other hand with an auctioning system, the Government could in principle, appropriate at least a part of these rents.

1/ There exists an extensive literature on the non-equivalence between quantitative restrictions (i.e. quotas) and tariffs. See, for example, Bhagwati and Srinivasan (1983).

The basic principles of an auctioning system, are fairly simple. Parties interested in obtaining the licenses offered for a given period of time (i.e. a quarter) would submit bids which can be thought of as demand schedules. That is, they would specify the unit price they are willing to pay for obtaining different quantities of licenses. These quantities corresponding to each unit price are then added up to obtain a total demand at each clearing unitary price. By equating the aggregate demand to the amount of licenses the Government wishes to supply, a market clearing unit price can be found for the licenses. All parties that bid a price higher than this clearing price would then get the licenses by paying the clearing price. The Government can thus capture the rents, and the people with the highest willingness to pay get the licenses and the goods. In order to utilize such an auction system it would be necessary to carry out a detailed study of how to put it into effect.

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ANNEX 8

WELFARE IMPACT OF REDUCING IMPORT RESTRICTIONS ON WHEAT*

This annex provides an analysis and quantification of the welfare effect of one major price intervention in Colombian agriculture, viz. import restrictions on wheat. The approach and results are applicable to other importables, as well, and they support the broad conclusions concerning import restrictions presented in Chapter 4.

In the absence of any import restrictions and port charges, the price of wheat in Bogota would be no more than c.i.f. price at a port (say, Cartagena) puls the cost of shipping from Cartagena to Bogota. Under competitive conditions, this also implies that the price in Pasto, the major wheat growing region, would be no more than the latter price minus the cost of transportation from Pasto to Cartagena. In 1982, because of import restrictions, the farmgate price was about 66% over what it would have been in the free trade situation. Part of the differential accrued to the government in the form of tariffs and part of it is in the form of economic rents to IDEMA.

As mentioned in the main text, the optimal tariff policy for wheat would not be a zero tariff but a tariff equal to those of its substitute in consumption and production. For lack of better information on the substitute goods, it will be assumed that the resources released from reduced domestic production of wheat and the expenditures diverted to the increased consumption of wheat go to/come from some representative composite good. The composite good is assumed to contain exportables, importables and non-traded goods in the same proportion as the composition of GDP. Also, the tradeables are assumed to have the same level of tariffs or export subsidieis as the average level in the economy.

Because both the breakdown of GDP into tradeables and non-tradeables and the levels of protection for tradeables is not known with a great deal of reliability, a sensitivity analysis of the resulting average level of protection is conducted. The range covers most plausible values for the parameters. To obtain a base case, it is assumed that 50% of the economy is composed of non-traded goods, 25% is exportable and 25% is importable.[1/] The average nominal tariff weighted by imports is found to be about 30% in 1983.[2/] The actual protection on importables is expected to be higher due

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* This annex was prepared by Mateen Thobani.

1/ About 55% of the GDP is composed of services, most of which are non-traded. Similarly, over 40% of the GDP is composed of agricultural and industrial goods, most of which are tradeable.

2/ See Chapter 3.

to licensing restrictions. Also, based on previous studies,[3/] the average effective rate of protection is expected to be higher than the nominal. Therefore, a plausible value of the average distortion to importables--which is a weighted average of the effective and nominal rates of protection--is taken to be 45%.

On the side of exportables, there are two major subsidies, CAT (now changed to CERT) which in 1983 had an average level of 11.3%, and PROEXPO credit which in 1981 had an average level of 8%.[4/] However, because of certain export restrictions and taxes on some crops, a figure of 15% rather than 19% is used for the base case calculation of the average distortion in exportables.[5/] Thus the average distortion on the economy as a whole will be .25 x 15% + .25 x 45% + .50 x 0% = 15%. Making fairly large changes in the base case parameters causes the average distortion to vary from 10 to 20% and hence these values are the ones used in the sensitivity analysis.

Under the assumptions made here, the tariff on wheat that is optimal will be equal to the average level of distortion in the economy. Figure 8-1 shows the changes in welfare and net efficiency gains from lowering tariffs to the optimal level. At the current price P_1, Q_1 units are domestically produced but Q_3 are consumed, implying imports of $Q_3 - Q_1$. Lowering the price to P2, which is the price that would prevail with a tariff equal to the average distortion, would decrease production to Q_2 and increase consumption to Q_4 implying an increase in imports of $(Q_1 - Q_2) + (Q_4 - Q_3)$. P_3 is the price that would prevail in the absence of any tariffs and hence G + H reflects the expenditure in foreign exchange on the increased imports of wheat. Of course, this is not the net loss in foreign exchange since the resources freed from the production of wheat and the increased expenditure on wheat would cause an increase in production of other goods and a decrease in the consumption of other goods and a decrease in the consumption of other goods. This would cause decreased imports or increased exports of other goods. Under our assumptions, the cost of the additional foreign exchange will simply be E + F, which may be interpreted either as the decrease in tariff revenue and increase in export subsidies from the decreased imports and increased exports, or as reflecting the shadow price of foreign exchange (since P_3 units of foreign exchange have a worth to society of P_2 units). The calculation of changes in welfare is given in Figure 8-1. The reader should verify that under our assumptions, no net gain can result from lowering tariffs to a level below P_2 because the increased cost of foreign exchange or the reduction in tariff revenues from substitute goods outweighs the reduction in deadweight loss.

Table 8-1 calculates the welfare gains and losses from lowering wheat restrictions based on three values of the level of distortion (and hence the optimal tariff level). All price and quantity data are for 1982. The elasticities of demand and supply have been taken from a study conducted

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3/ G. Giraldo, "Estructura de la Proteccion en Colombia", Revista de Planeacion y Desarrollo, May-August 1979.

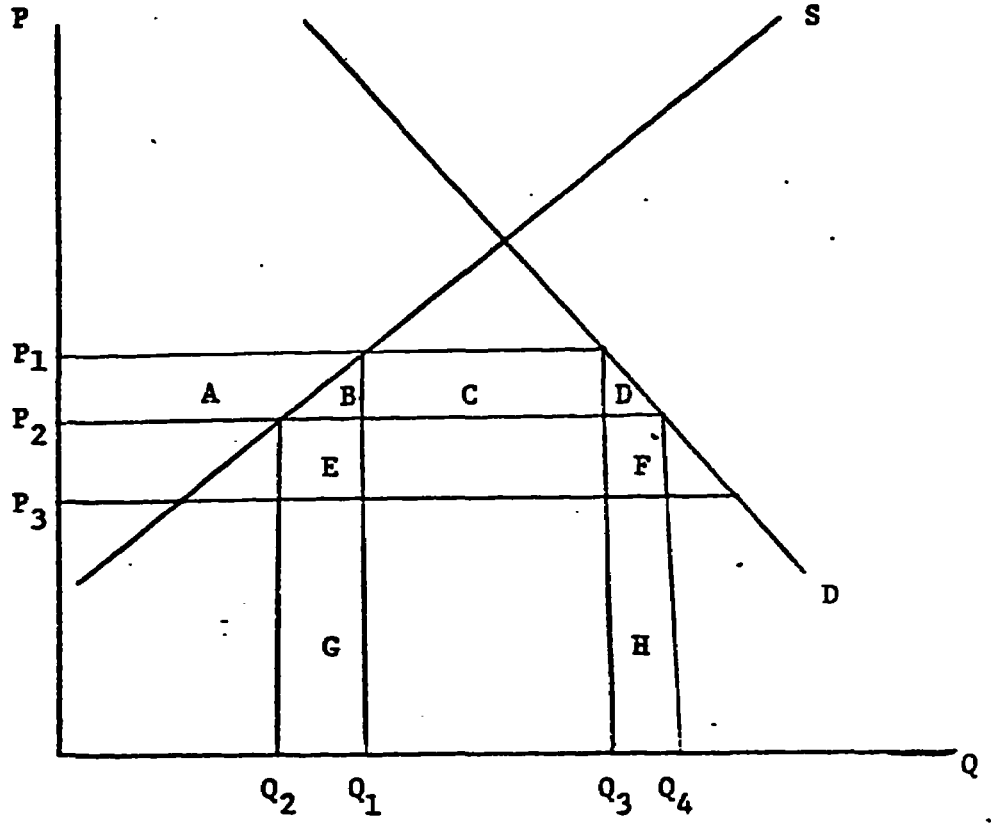
4/ Mission estimates.

5/ Information on the effective rates of protection for exportables is not available so they are implicitly assumed to be equal to the nominal protection rates (i.e., export subsidies).

by FEDESARROLLO.6/ The implied farmgate price is simply the c.i.f. price plus transportation costs from Cartagena to Bogotao less transportation costs from Bogota to Pasto. The implications of the results are discussed in Chapter 4.

6/ See R. Junguito, "FEDESARROLLO Estudio para PROEXPO Sobre Exportaciones," Bogota, February, 1978.

Figure 8-1: IMPACT OF LOWERING IMPORT RESTRICTIONS



Change in Consumer Surplus	A + B + C + D
Change in Producer Surplus	- A
Change in Rents and Tariff Revenues	- C + E + F
Cost of Foreign Exchange (Reduction in Tariff Revenues on Substitute Goods)	- E - F
Net Efficiency Gain	B + D

Table 8-1: IMPACT OF LOWERING IMPORT RESTRICTIONS

(All prices in 1982 pesos/ton, all quantities in tons, all welfare measures in millions of pesos)

Initial Values

Farmgate Price	21,008	Quantity Produced	70,700
CIF Price	11,000	Quantity Consumed	537,400
Transp. (Cartagena-Bogota)	3,700	Quantity Imported	466,700
Transp. (Bogota-Pasto)	2,070	Elasticity of Demand	0.5343
		Elasticity of Supply	0.6

Tariff Level	10%	15%	20%
Implied Farmgate Price	13,730	14,280	14,830
Implied Decrease in Price	7,278	6,728	6,178
Decrease in Production	14,696	13,585	12,475
Increase in Consumption	47,451	43,865	40,279
Increase in Imports	62,147	57,450	52,754
Decrease in Producer Surplus	461	430	398
Increase in Government Surplus	4,084	3,763	3,444
Decrease in Tariffs and Rents	3,328	3,045	2,767
Cost of Increase Foreign Exchange	68	95	116
NET GAIN	226	193	163

Source: Mission Estimates

ANNEX 9

STABILITY AND PREDICTABILITY OF PRICES, PRODUCERS' INCOME AND PROFITABILITY*

Introduction

This annex describes how indexes were constructed for several crops to measure the stability and predictability of several economic variables over the time period 1970-1981 (Chapter 5). The crops are barley, beans, coffee, corn, cotton, potatoes, rice, sugar and wheat. The variables are international price, domestic producer price, domestic consumer price, producer income, profit per ton, profit per hectare planted (or for some crops, gross income per hectare). All variables are in real terms of 1975 peso adjusted by the gross internal product implicit price deflator. Their methods of computation are described below. Next, the method of computing the indexes is described, and finally the results are presented and discussed.

Data Sources

The international price for each product in each year is the implicit import/export price. That is, it is the total value in pesos of the imports or exports of the product divided by the quantity imported or exported. The prices were provided by the Sociedad de Agricultores de Colombia. For rice, two years of missing data were constructed by taking the previous year's price and adjusting it in such a way that the price moved by the same percentage as did rice prices on world markets. (This information was taken from International Financial Statistics). The implicit export price for sugar was for processed sugar. Since it was necessary to make this comparable to producer prices for sugar cane, the export price of sugar each year was adjusted by the overall average percentage mark-up from cane to processed sugar to give some indication of how sugar cane prices would have moved had they been governed by movements in international prices. The implicit international price is not available for beans.

Producer prices were taken from a DNP working paper, a Banco de la Republica source and (for coffee) a FEDERACAFE publication "Boletin de Informacion Estatistica sobre el Cafe", No. 48. Consumer prices were taken from a DNP-UEA working paper of February 28, 1983, "Series de Precios del Sector Agropecuario: 1950-1982". Consumer prices are not available for barley, coffee and cotton. Output was taken from Table 7.1 of the statistical appendix to the World Bank publication "Colombia: Economic Development and Policy under Changing Conditions", April 8, 1983. Yield per hectare was taken from a DNP document "Indicadores Fisicas Nacionales del Sector Agropecuario, 1950-1981". For corn, cotton, rice and wheat, real production costs (per ton) were taken from Table 4.11 of "Aspects of Agricultural Development in Colombia, 1970-1981" by Jorge Garcia-Garcia, a paper prepared for this report. Producer income at domestic prices was computed by multiplying the producer price by output. Likewise, producer income at international prices was computed by multiplying the international price by output. For the four crops for which production cost per ton figures were

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* Annexes 9 through 13 were prepared by John Nash.

available, the profit per ton at domestic and international prices was computed by subtracting the cost from the appropriate price each year.

The gross income per hectare at domestic and international prices was computed by multiplying the appropriate price by the yield (in tons per hectare) each year. The profit per hectare at domestic and international prices was computed by multiplying the profit per ton by the yield.

Method of Index Calculation

After the series were computed for each crop, two indexes were calculated for each of the following series for each crop: international price, producer price, consumer price, profit per ton at domestic prices, profit per ton at international prices, producer income and profit per hectare or (for crops for which production cost was not available) gross income per hectare.

Index 1 is an index of variability or instability. It is simply the standard error of a linear least-squares regression of the series, using time as the independent variable (to remove any secular trend). For the price series and the profit per ton series, the standard error was divided by the mean price in order to transform it into percentage terms and make the indexes comparable across crops. After all, an average $1,000 yearly change in the price of coffee (with a price of around $89,000/ton) would indicate much less instability than the same average change in the price of barley (with a price of around $17,000/ton); to be comparable, the indexes should be in percentage terms. For the same reason, the indexes for the series of producer income were computed by dividing the standard error by the respective means. This was not done for the series profit per hectare and gross income per hectare. The reason is that the indexes from these series were designed to measure the instability of return on investment, the investment being in a hectare of land. The return on investment is the profit (or gross income) divided by the cost of the investment (the implicit rental value of the land). Since the implicit rental value of the land itself is not dependent on the crop planted, it would be the same for each crop. Dividing each crop's standard error by the same number would not change the ordering of the indexes so there is really no reason to do so.

Index 2 is designed to measure uncertainty or unpredictability. It is important to draw the distinction between instability and unpredictability, since it is conceptually possible that a variable, price for example, would be quite unstable but perfectly predictable. If so, the instability would create no risk in the sense of uncertainty, though it might create other problems, such as destabilization of macroeconomic variables. Thus, both indexes are potentially important, each for analyzing a different kind of issue.

Index 2 was computed as follows. After each series was de-trended by a linear regression against time, the residuals were taken and fitted to a first-order autoregressive process of the form $X_t = \lambda X_{t-1} + \varepsilon_t$, where ε_t is "white noise". Index 2 is the standard error of this regression, divided where appropriate by the mean in order to transform it to percentage terms. This index represents the average absolute size of the prediction error involved in predicting one year's value of the variable from the previous

year's value. It is thus a measure of the degree to which each series is unpredictable. (Clearly, it would be desirable to use a more complicated ARIMA scheme to try to capture any predictability, but data constraints make this impossible.)

The results are reported below. That domestic prices are in general more stable than international can be seen in Table 3, where the ratio of international price instability to domestic price instability can be seen to be greater than unity for most crops. For potato, a crop with relatively little intervention, the ratio is rather low, providing some evidence that the government's intervention programs may be a factor in stabilizing price. However, this cannot be said about some of the other variables. For example, in Table 9-1, the variability of producer income for potatoes at international prices is larger relative to variability at domestic prices than is this ratio for several other crops. It is not clear, therefore, that government stabilization programs have stabilized incomes.

Table 9-1 INDEXES OF INSTABILITY AND UNPREDICTABILITY

	Index 1	Index 2
(1) International Price		
Barley	0.223	0.252
Coffee	0.347	0.371
Corn	0.218	0.286
Cotton	0.163	0.227
Potato	0.261	0.377
Rice	0.277	0.388
Sugar	0.692	0.658
Wheat	0.382	0.339
(2) Producer Price		
Barley	0.146	0.221
Beans	0.143	0.240
Coffee	0.219	0.286
Corn	0.118	0.277
Cotton	0.167	0.259
Potato	0.204	0.342
Rice	0.092	0.305
Sugar	0.081	0.229
Wheat	0.165	0.251
(3) Ratio: (1)/(2)		
Barley	1.53	1.14
Coffee	1.59	1.30
Corn	1.85	1.03
Cotton	0.97	0.88
Potato	1.28	1.10
Rice	3.01	1.27
Sugar	8.55	2.87
Wheat	2.32	1.35
(4) Consumer Price		
Beans	0.103	0.238
Corn	0.119	0.261
Potato	0.144	0.308
Rice	0.084	0.252
Sugar	0.221	0.399
Wheat	0.161	0.258

(5) Producer Income at International Prices

Barley	0.341	0.409
Coffee	0.407	0.415
Corn	0.172	0.315
Cotton	0.265	0.316
Potato	0.302	0.465
Rice	0.393	0.485
Sugar	0.712	0.701
Wheat	0.423	0.500

(6) Producer Income at Domestic Prices

Barley	0.286	0.386
Beans	0.277	0.218
Coffee	0.262	0.295
Corn	0.085	0.237
Cotton	0.294	0.366
Potato	0.179	0.332
Rice	0.163	0.239
Sugar	0.066	0.210
Wheat	0.290	0.478

(7) Ratio: (5)/(6)

Barley	1.19	1.06
Coffee	1.56	1.41
Corn	2.03	1.33
Cotton	0.90	0.86
Potato	1.68	1.40
Rice	2.42	2.03
Sugar	10.79	3.34
Wheat	1.46	1.05

(8) Profit per Ton at International Prices

Corn	0.397	0.396
Cotton	0.221	0.252
Rice	0.319	0.391
Wheat	0.444	0.395

(9) Profit per Ton at Domestic Prices

Beans	0.162	0.193
Corn	0.225	0.225
Cotton	0.228	0.308
Rice	0.159	0.168
Wheat	0.192	0.181

(10) Ratio: (8)/(9)

Corn	1.77	1.76
Cotton	0.97	0.82
Rice	2.01	2.33
Wheat	2.32	2.18

(11) Gross Income per Hectare at International Prices

Barley	1245.0	2115.2
Coffee	11240.0	12451.8
Potato	11970.0	19675.7
Sugar	1726.0	1636.1

(12) Gross Income per Hectare at Domestic Prices

Barley	1012.0	2003.9
Coffee	3065.0	4066.4
Potato	6663.0	11223.4
Sugar	224.6	587.1

(13) Ratio: (11/(12)

Barley	1.23	1.06
Coffee	3.67	3.06
Potato	1.80	1.75
Sugar	7.68	2.79

(14) Profit per Hectare at International Prices

Corn	1601.0	1597.1
Cotton	12410.0	14494.2
Rice	2442.0	2993.0
Wheat	1857.0	1670.8

(15) Profit per Hectare at Domestic Prices

Beans	1503.0	1853.2
Corn	1221.0	1243.0
Cotton	9778.0	13214.7
Rice	2599.0	2706.5
Wheat	1056.0	996.7

(16) Ratio: (14)/(15)

Corn	1.31	1.28
Cotton	1.27	1.10
Rice	0.94	1.11
Wheat	1.76	1.68

Source: Mission estimates (see Chapter 5).

ANNEX 10

EFFECTIVENESS OF BUFFER STOCKS FOR STABILIZATION

This annex analyzes the effect of a government-operated buffer stock for an agricultural commodity on the stability of demand for non-agricultural commodities. It indicates--as concluded in Chapter 5--that in general there is no presumption that such a buffer stock would stabilize non-agricultural demand; to the contrary, it might very well destabilize it.

Let D = demand for some manufactured consumption good with a fixed price of unity for simplicity; $D_p(I_p)$ = demand for good D by producers of agricultural products as a function of their income; $D_c(I_c)$ = demand for good D by consumers of agricultural products, as a function of their income not spent on food; Q = agricultural production; P(Q) = the price of agricultural production as a function of Q; I = agricultural consumers' total income (exogenously given). Then:

(10.1) $D = D_p(I_p) + D_c(I_c) = D_p(QP) + D_c(I - QP)$

(10.2) $dD = [D_p' - D_c'] [PdQ + QP'dQ)] = PdQ[1 + \eta] [D_p' - D_c']$,

where η is the inverse elasticity of demand. According to (10.2), shifts in Q result in shifts in demand for the non-agricultural consumption good only to the extent that η differs from -1, and only to the extent that agricultural producers and consumers differ in their marginal propensities to consume the good. Now, suppose we introduce a scheme to stabilize the price of the agricultural product at $\bar{P}$. First, suppose the scheme operates as a buffer stock, that is, in years when output exceeds $Q(\bar{P})$, the stock agency buys the excess and stores it for sale in years when output falls short of $Q(\bar{P})$. In years when the agency sells some of its stocks, the proceeds are saved for years when it must make purchases. Since consumers' expenditure on the non-agricultural good never varies (because the price is fixed and demand for this product is assumed non-stochastic), and since the buffer stock agency only buys and sells the agricultural good, changes in producer demand, D_p, are the only source of fluctuations in demand for the non-agricultural good. So:

(10.3) $dD_{bs} = \bar{P}dQ[D_p']$, where we use D_{bs} to indicate the change in demand

for the non-agricultural good when a buffer stock is operating for the agricultural good. Comparing (10.2) with (10.3), we can observe that if $D_c' < 2D_p'$, and $/\eta/ 2$, then $/dD_{bs}/ > /dD/$, starting from a price $P = \bar{P}$. Under these circumstances, the buffer stock definitely de-stabilizes the demand for the non-agricultural good. Under other circumstances, it may or may not, but unless agricultural consumers as a group have a much larger marginal propensity to consume the non-agricultural good than do producers, or unless the demand elasticity is very small in absolute value, the buffer stock cannot stabilize non-agricultural demand. Now suppose that the price stabilization scheme is financed out of current expenditure. That is, in years when production exceeds $Q(\bar{P})$, the excess is purchased and exported, and in years when production falls short of $Q(\bar{P})$, the required quantity is imported and sold to consumers at P; no stocks are held. (IDEMA's price stabilization policies seem to be a sort of hybrid between the buffer stock and current expenditure approaches.) Once again, consumer expenditure on the agricultural good is

fixed, so demand for the non-agricultural good does not fluctuate from this source. Agricultural production shifts cause shifts in non-agricultural demand because agricultural producers' incomes fluctuate and because the Government's demand for other products must fluctuate inversely to their net expenditures on agricultural imports or exports. (For example, an increase in domestic agricultural production will cause an increase in exports or decrease in imports, which will cause an increase in Government revenue if the world price, P_w, exceeds the domestic price, $\bar{P}$, or a decrease in revenue if P_w is less than $\bar{P}$.) So, we have:

$$(10.4) \qquad dD_{ce} = \bar{P}dQD'_p + dQ(P_w - \bar{P})D'_c ,$$

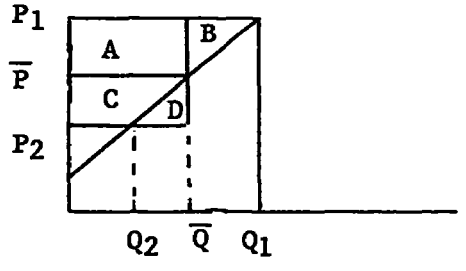
where D_{ce} is the non-agricultural demand when price is stabilized out of current Government expenditure and D'_c is the Government's marginal propensity to consume the non-agricultural good. Comparing (10.4) with (10.2), there is no clear presumption about whether the agricultural price stabilization policy stabilizes non-agricultural demand. In one sense, the policy seems more likely to make demand less predictable, since there is one source of uncertainty in (10.4) which does not appear in (10.2)—the world price. For this reason, $D'_p = D'_c$ is a sufficient condition in (10.2) to assure that shifts in Q do not affect D, whereas $D'_p = D'_c$ in (10.4) is not.

ANNEX 11

WELFARE COST OF PRICE STABILIZATION

This annex explains the origin of the efficiency cost estimates of price stabilization, which are presented in Table 5.2 of Chapter 5. To illustrate the methodology, the explanation will be phrased in terms of a simple model of an export good whose price in the world market assumes only two values, P_1 or P_2 ($P_1 \geq P_2$), each with probability 1/2, and whose domestic producer price is stabilized at the mean value, $\bar{P}$, by means of a tax-subsidy scheme devised so that the average protection is 0. (That is, when world price is P_1 there is a tax of $P_1-\bar{P}$ on the export; when world price is P_2, there is a subsidy of $\bar{P}-P_2$.) The results can easily be extended to an import good, a good with multiple possible prices, and a good with a rate of protection which differs from 0, either positively or negatively. The explanation assumes a linear supply schedule. To derive the formula exactly, this must be true, at least locally.

Figure 11-1 EFFECT OF PRICE STABILIZATION



Consider Figure 1. With a price stabilization scheme, since producers always receive price $\bar{P}$, they always produce quantity $\bar{Q}$. When world price is P_1, the government receives area A in export taxes; when world price is P_2, the government gives subsidies equal to (C+D). When world price is P_1, exporters forego a producer surplus increase of (A+B) by selling only quantity $\bar{Q}$ at a price of $\bar{P}$. But area A is not a welfare loss to the country because it goes to the government in taxes. The welfare loss from maintaining producer price at $\bar{P}$ is area B. Area B is a triangle whose area is $\frac{1}{2}(P_1-\bar{P})(Q_1-\bar{Q})$. The quantity $(Q_1-\bar{Q})$ can be expressed as $dQ/dP\ (P_1-\bar{P})$, so area $B = \frac{1}{2}(P_1-\bar{P})^2\ dQ/dP = \frac{1}{2}(P_1-\bar{P})^2(\bar{Q}/\bar{P})E$, where E is the export supply elasticity. By the same kind of logic, the welfare loss to the economy from maintaining internal price of $\bar{P}$ when the world price is P_2 is area D, which is $\frac{1}{2}(P_2-\bar{P})^2(\bar{Q}/\bar{P})E$. So, the average yearly loss is $\frac{1}{2}E(\bar{Q}/\bar{P})$ var (P), where var (P) is the variance of the world price. (By definition, the variance is the average of $(P_1-\bar{P})^2$ and $(P_2-\bar{P})^2$).

Also, by similar logic, the welfare loss from stabilization of the price of an imported good can be shown to be $\frac{1}{2}N/(\bar{Q}/\bar{P})$ var (P), where N is the import demand elasticity.

To give some idea of the magnitude of such welfare losses, the values of $\bar{Q}$, $\bar{P}$, var (P) and $\frac{1}{2}E(Q/P)$ var (P) or $\frac{1}{2}N/(\bar{Q}/\bar{P})$ var (P) are reported below for a small sample of crops. The import and export elasticities are

computed from estimates of domestic elasticities of demand and short-run supply, and thus are the elasticities which would prevail in a market with no governmental interference in free trade. The estimates of domestic elasticities were taken from the results of the background study for an article on nutrition in Colombia.[1]/

Table 11-1 ANNUAL WELFARE LOSSES FROM PRICE STABILIZATION
(1975 pesos)

Import Crops	Wheat	Corn	Barley
$\bar{Q}$ (MT)	364,167	57,125	50,125
$\bar{P}$ ($/MT)	3,471	3,072	3,898
var (P)	1,642,000	541,900	710,200
N	-.69	-12.08	-0.19
$\frac{1}{2}/N/(\bar{Q}/\bar{P})$ var (P)	59,434,446	60,864,084	867,595

Export Crops	Rice	Cotton	Potato
$\bar{Q}$	22,467	50,317	6,708
$\bar{P}$	7,660	32,961	4,571
var (P)	4,093,000	26,950,000	2,299,000
E	38.60	5.28	74.87
$\frac{1}{2}E(\bar{Q}/\bar{P})$ var (P)	231,694,311	108,611,811	126,298,630

Source: Mission estimates.

1/ "The Impact of Increasing Food Supply on Human Nutrition: Implications for Commodity Priorities in Agricultural Research and Policy", by Per Pinstrup-Anderson, Norha Ruiz de Londoño, and Edward Hoover, American Journal of Agricultural Economics, May 1976, p. 131-142.

ANNEX 12

NON-FINANCIAL COSTS OF STORAGE

Chapter 5 discusses in some detail the subject of the financial costs of storage, because these costs can be computed fairly precisely. This annex is concerned primarily with indirectly estimating the non-financial costs of storage using price data. The preliminary conclusions herein tend to reinforce those of the text; that is, IDEMA's estimates of storage cost, on which it bases pricing policy, should be revised upward and should be calculated separately for each crop. Or, preferably, IDEMA should follow market prices in its pricing, rather than trying to artificially restrain price increases.

It is possible to estimate the true cost of storage in a free market by looking at the rate of price rise over the period when marginal consumption comes from stored commodities. (This does not necessarily mean a period when there is no harvest, but rather a period when harvest is insufficient to meet the demand.) During this period, the price must be expected to rise by at least as much as it costs to store a commodity; otherwise, storers would store less, causing price to rise over the period faster. That is to say, if a processor buys rice at $100/ton on February 1, for use on May 1, incurring net costs[1/] of $10/month for storage, he does so because he expects the price in May to be $130 or more; otherwise, he would simply wait until May to buy the amount he needs. The collective action of many such producers in buying less in February and more in May would lower the February price and raise the May price, causing price to rise faster between these months. Furthermore, if the storage industry is competitive, the price increase must be generally expected to be no more than the cost of storage - otherwise, the excess profits would cause competitive storers to buy more in the current period for resale later, driving the current price up, the future price down, and decreasing the price spread. Both of these conditions together determine that price must be expected to rise at a rate which just covers the costs of storage. These conditions, of course, are based on expectations, but we assume that on average, expectations are realized, that is, even though in any given year, the price is likely to rise slower or faster than expected, the former type of years balance the latter, so that over a long period of time, expectations are correct. Consequently, the long-run average rate of price increase during periods when marginal consumption comes from storage is a good indication of storage costs.

This annex uses the general method outlined above to estimate the degree by which IDEMA's target rate of price increase understates the true cost of storage, and therefore the degree to which it is likely to make private storage unprofitable. Because the financial cost of storage can be

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1/ Costs include the financial opportunity cost of funds "tied up" in the stored commodity, and are net of any benefits a storer may receive from holding stocks, e.g., the convenience of having stocks available to fill unexpected demand.

easily computed in other ways, and because it varies substantially from year to year, we are mainly interested here in estimating the non-financial costs. We do this by taking the rate of price increase during a non-harvest period each year, subtracting from it the financial cost for that year (computed from Tables 5.3 and Annex Table 28), then averaging the residual over the available years. These years are 1978-1981 for rice, 1980-1981 for corn, and 1973-1981 for potatoes. Rice and corn, of course, are markets in which IDEMA intervenes and in which it may have suppressed "natural" price increases. These estimates, therefore, should be considered lower bounds on the true non-financial storage costs. The estimates are in Tables 12-1 through 12-3 below.

While it is hard to draw definite conclusions on the basis of estimates from such a limited number of years and crops, the results at least call into question IDEMA's estimates of storage costs, upon which its pricing policy is based. (These estimates are based on IDEMA's idea of what their costs are for each component of storage cost.) While IDEMA estimates non-financial storage costs for grains of 1.52% per month, the estimates in Tables 12-2 and 12-3 are considerably higher, even for the two grains in whose market IDEMA intervenes. The estimate of the non-financial cost of potato storage in Table A1 is extremely high. This can be partially explained by a high rate of spoilage for potatoes, which is a real storage cost, but even making allowance for this leaves a very high estimate of other costs. This is especially significant because this is a crop in whose market IDEMA does not attempt to restrain price increases, and is in that sense the best estimate of true storage costs.

On balance, the evidence indicates that the non-financial costs of storage, like the financial costs, are higher than IDEMA estimates, and vary from crop to crop. We believe that if IDEMA is not to discourage private storage activity, it must be guided in its pricing by market prices, or at least base its guidelines regarding price increases on historical trends rather than on some figure which does not accurately reflect the costs of private storers. It may very well be true, of course, that IDEMA's estimate of its own storage cost is accurate, but this may under-estimate private storage costs because of differences in access to technology or perhaps other factors as well. Unless IDEMA intends to take over all storage activity, it must allow private storers to recover their costs.

Table 12-1 NON-FINANCIAL COSTS OF STORAGE: POTATO
(All figures % per two months)

Year	(1) Price Rise[1]/	(2) Financial Cost A[2]/	(3) Financial Cost B[2]/	(4) Non-Financial Cost A[3]/	(5) Non-Financial Cost B[4]/
1973	62.3	2.0	2.4	60.3	59.9
1974	85.4	3.0	3.7	82.4	81.7
1975	23.9	3.1	3.1	20.8	20.8
1976	12.0	3.0	3.2	9.0	8.9
1977	18.1	3.0	3.3	15.1	14.8
1978	61.8	3.1	3.5	58.7	58.3
1979	48.0	3.5	4.7	44.5	43.3
1980	26.8	4.6	5.3	22.2	21.5
1981	10.1	5.6	5.9	4.5	4.2
			Average	35.3	34.8
			Monthly Average	17.6	17.4

1/ January/February average to March/April average.

2/ Financial cost = $r_m - .8\ (P_b/P_m)\ (r_m - r_s)$, where r_m=market interest rate, P_b=basic price, P_m=market price for product, r_s = subsidized bonos de prenda loan rate.
Since figures are not available on P_b, financial cost was computed under two assumptions. Financial cost A assumes that $P_b=P_m$ for every year. Financial cost B assumes that (P_b/P_m) for potatoes is equal to the average for the crops in Table 2 in the text for each year. To the extent that (P_b/P_m) for potatoes is below the average, both estimates overstate the financial costs and so underestimate the non-financial costs.

3/ Non-financial Cost A = (1) - (2)

4/ Non-financial Cost B = (1) - (3)

Source: Table 5.3 and Annex Table 5-1, and monthly price information from CORABASTOS for "Papa ICA Purace".

Table 12-2 NON-FINANCIAL COSTS OF STORAGE: RICE
(all figures % per two months)

Year	Price Rise[1]/	Financial Cost[2]/	Non-Financial Cost[3]/
1978	1.7	3.5	-1.8
1979	20.0	4.6	15.4
1980	14.3	5.2	9.1
1981	2.9	5.9	-3.0
		Average	4.9
		Monthly Average	2.5

1/ March to May
2/ Financial Cost = $P_m - .8\ (P_b/P_m)\ (r_m - r_s)$, where the variables are as defined in footnote 2 of Table A1
3/ Non-financial cost = (1) - (2)

Sources: Table 5.3 and Annex Table 5-1, and monthly price information from CORABASTOS. Data is for "Arroz Cica 9," first quality.

Table 12.3 NON-FINANCIAL COSTS OF STORAGE: CORN
(all figures % per three months)

Year	Price Rise[1]/	Financial Cost[2]/	Non-Financial Cost[3]/
1980	16.7	8.6	8.1
1981	10.7	8.8	1.9
		Average	5.0
		Monthly Average	1.7

1/ August/September average to November/December average.
2/ Financial Cost = $r_m - .8\ (P_b/P_m)\ (r_m - r_s)$, where the variables are as defined in Footnote 2 of Table A1.
3/ Non-financial cost = (1) - (2)

Sources: Table 5.2 and Table 5-1, and monthly price information on "Maiz Amarillo" from IDEMA, Office of Planning.

ANNEX 13

THE ORGANIZATION AND MANAGEMENT OF THE COFFEE ECONOMY[1/]

For more than 50 years the National Federation of Coffee Growers (hereafter referred to as "the Federation" or FEDERACAFE), a private nonprofit-making association of coffee producers which engages in commercial activities, has had an important influence on policy and has been the main body charged by the Government with administering this policy as far as the coffee sector is concerned. The Federation is responsible for the management of the National Coffee Fund (NCF, see below), for the provision of technical assistance to the industry, for the control of domestic and export marketing and for advice on the setting of certain rates of taxation and prices which affect the industry.

The relationship between the Government and the Federation has been controlled since 1928 by a series of contracts which set out the duties to be delegated to the latter and the remuneration which it will receive in return for its services. The most recent of these covers the ten-year period from 31 December 1978.

Although the Federation is allowed considerable freedom of action in running the coffee industry, the Government can control its operations in a number of ways. First, the budget of the Federation is subject to the approval of the Government and, in addition, under the present contract, the Federation submits to the Government quarterly financial projections. Second, the appointment of the general manager of the Federation is subject to the approval of the President. Third, the Government can convene whenever it sees fit an extraordinary meeting of the National Congress of Coffee Growers, the supreme authority of the Federation. Ministers can present the views of the Government to the Congress, although they have no power to vote, and certain major decisions of the Congress are subject to the approval of the President. Finally, under the present contract the Government and the representatives of coffee growers have equal representation on the important National Committee of Coffee Growers which executes the decisions of the Congress. In addition to this control of the Federation, the Government determines the rates of all taxes in the country, including those specific to the coffee industry, and has a majority in the Committee which determines the price at which the Federation purchases coffee from growers.

1/ This annex draws extensively from a publication of the International Coffee Organization (ICO) - "Coffee in Colombia, 1979/80", September 23, 1980, and supports the analysis in Chapter 6.

Apart from administering the NCF and supervising the marketing of the crop, the main activities of the Federation are carried out by the Departmental Committees. In addition to the taxation set aside for specific campaigns, the Committees obtain income from their own assets, from various government departments and from the local community. The activities of the Committees are diverse, ranging from the provision of extension services and technical education to improvement of the infrastructure in coffee growing areas and the provision of social services. The Committees, therefore, benefit the community at large as well as growers of coffee and, to the extent that the resources of the Committees are drawn from taxation of the coffee sector, their activities result in a redistribution of income from this sector to the rest of the economy.

The NCF was originally established in 1940 to finance the surplus stocks expected to accumulate as a result of the international export quota arrangement introduced in that year. Throughout the life of the Fund its administration has been delegated to the Federation. With the passing of time the functions of the Fund have increased in scope so that it has become the main instrument for regulating the supply and the price of coffee. It has also become an important investor in activities related to the production of and trade in coffee.

Coffee Marketing and Export

Coffee is generally partially processed on the farm and then sold in the form of dried "parchment". The dried parchment is brought to the nearest village or town where it is sold either at one of the 500 purchasing points of the Federation or to commercial buyers such as exporters and dealers who subsequently sell to the Federation or to private exporters. The parchment is then bulked and transported to the nearest depot or mill of the Federation or the exporter concerned as the case may be.

The Federation guarantees to purchase parchment coffee delivered to its agents at the same price throughout the country, provided that the parchment is of "Federation type", that is above a given quality standard. This price is established by a committee which includes the Ministers of Agriculture and Finance and the General Manager of the Federation. For ease of reference this will hereafter be referred to as the "minimum price".

Coffee is exported by the Federation and by private traders. The latter export not only coffee purchased from growers and private dealers but also coffee sold to them from the stocks of the Federation. The price at which the Federation sells for this purpose is set in terms of an ex-dock New York price expressed in cents per pound and is varied frequently. The volume of coffee exported by the Federation and by private exporters is compared in Table 13-1 for crop years since 1969/70. The reason that the Federation's share of exports varies from year to year is discussed below.

All proceeds from the export of coffee must be surrendered to the Central Bank within twenty days of registration for export. After deduction of the ad valorem tax, the Bank in the past exchanged these proceeds for currency exchange certificates which can be converted to pesos immediately at a discount of between 6 and 15 percent or after 120 days at their full face value; recently this discount has been eliminated.

Table 13-1 COLOMBIA: EXPORTS OF COFFEE BY THE FEDERATION AND BY PRIVATE EXPORTERS
(60 kilo bags)

Crop year	Federation	Private Exporters	Total[1]/	Proportion by Federation (percent)
1969/70	2,963,781	3,910,284	6,874,065	(43)
1970/71	2,478,130	3,852,543	6,330,673	(39)
1971/72	2,302,435	4,184,517	6,486,952	(35)
1972/73	2,589,297	3,665,266	6,254,563	(41)
1973/74	3,226,002	4,181,856	7,407,858	(44)
1974/75	3,027,621	4,514,498	7,542,119	(40)
1975/76	1,489,127	5,533,834	7,022,961	(21)
1976/77	1,742,338	3,549,892	5,292,230	(30)
1977/78	4,811,162	2,747,072	7,558,234	(64)
1978/79	8,838,438	2,592,775	11,431,213	(77)
1979/80	11,357,071	182,814	11,539,885	(98)
1980/81	6,106,128	2,924,491	9,030,619	(67)
1981/82	5,241,000	3,749,000	8,990,000	(58)
1982/83	5,110,000	4,064,000	9,174,000	(56)

1/ Official registered exports only.

Source: FEDERACAFE.

To ensure that the amount of foreign exchange corresponding to the actual earnings from exports enters the country, a minimum surrender price is set by the Monetary Board of the Central Bank for coffee and certain other commodities. For green coffee the minimum surrender price, the reintegro cafetero, represents the amount of foreign exchange per 70 kg bag which exporters are required to surrender to the Bank.

As the international price varies, the amount of the reintegro is adjusted so that the reintegro payments to the Bank equal the foreign exchange earnings from the export of coffee. In practice there has tended to be a time lag between changes in the international price and in the reintegro. In rising markets this has tended to result in reintegros below the unit values of foreign exchange earnings, thereby allowing exporters to accumulate holdings of foreign currency and increase their margins as a

result of the fact that the export tax is based on the reintegro. When coffee prices fall, the reintegro price tends to be higher than the unit value of export earnings and exporters have had to purchase foreign exchange on the free market in order to be able to make the full payment of the reintegro to the Bank. Changes in the reintegro price expressed in US cents per lb. and the ICO indicator price for Colombian Mild Arabicas ruling on the day of the change are given for the period since 1975 in Table 13-2.

Export Taxation and Contributions

Sales of coffee by growers are subject to four indirect taxes and contributions, described below. An exporter of coffee, prior to receiving permission to export, must provide evidence of payment of the first three of these taxes.

The retention quota

Private exporters must contribute to the NCF without compensation an amount of parchment related to the excelso to be exported. The parchment must be delivered to a warehouse of ALMACAFE, a wholly owned subsidiary of the Federation. Exports by the Federation are made on behalf of the Fund and the tax on these exports is an internal transaction within the Fund.

While its original purpose in 1958 was to accumulate in public hands the coffee withheld from the market under a retention agreement among Latin American producers, the retention tax has come to be used as a device to manipulate domestic prices and to shield domestic producers from the full impact of changes in world prices. In periods when the world price was high, the retention tax was raised to keep domestic prices relatively low, as in 1976, when the tax was at 85%. Conversely, in periods of low world prices, the retention tax was lowered to prevent domestic prices from falling too much. Mostly as a consequence of changes in the retention tax and the Federation's guaranteed minimum purchase price, yearly changes in producer prices have been on average only half as great as changes in the world price (see Table 1 of the text). Table 13-3 shows the reintegro minimo (approximately the world price) and the retention tax since 1978. Changes in the reintegro are accompanied or quickly followed by changes in the same direction of the retention tax.

The pasilla and ripio tax

Before a license is issued to an exporter for the export of a consignment of green coffee he must provide evidence of sale to the Federation of an amount of low grade pasilla and ripio parchment equivalent to 6 percent of the volume of the consignment. For the delivery, which must comprise eleven parts pasilla to one part ripio and be made to a warehouse of ALMACAFE, the exporter receives a payment of 6 pesos per 62.5 kg. bag of hulled coffee. This rate of payment has been unchanged since 1941 and now comprises only a fraction of a percentage point of the value of the coffee. The pasilla and ripio tax is designed to remove low grade coffee from the export market and provide the Federation with stocks for sale to the domestic market.

Table 13-2 COLOMBIA: AMOUNTS AND EFFECTIVE DATES OF COFFEE REINTEGRO AND THE ICO INDICATOR PRICE FOR COLOMBIAN MILD ARABICAS

Effective Date	Reintegro		ICO indicator price for Mild Arabicas (US cents/lb)
	US$/70 kg.bag	US cents/lb.	
1975			
22 July	117.00	75.82	
1976			
15 January	130.00	84.24	102.50
20 February	143.00	92.66	107.50
1 April	153.50	99.47	118.50
7 April	170.00	110.16	123.25
12 April	193.00	125.06	136.00
7 May	207.00	134.14	147.75
18 May	231.00	149.69	156.50
27 May	245.00	158.76	168.00
8 June	259.25	167.99	185.00
29 November	284.65	184.45	195.00
28 December	307.60	199.32	223.00
1977			
11 February	331.00	214.49	236.00
17 February	354.00	229.39	249.50
24 February	376.50	243.97	275.00
28 February	423.00	274.10	304.00
9 March	440.00	285.12	309.00
23 March	457.00	296.13	325.00
14 April	477.00	309.09	334.00
26 May	466.50	302.29	290.00
16 June	415.00	268.92	229.50
12 July	376.50	243.97	241.00
16 July	361.00	233.93	245.00
18 August	313.75	203.31	202.00
1978			
8 April	290.00	187.92	193.00
16 June	275.00	178.20	191.50
17 July	259.00	167.83	229.50
1979			
24 January	243.00	157.46	160.00
31 January	217.00	140.62	148.00
22 February	188.40	122.08	129.00
19 April	202.00	130.89	142.00
5 May	216.00	139.97	155.00
5 June	251.00	162.65	186.00
1980			
9 May	287.32	186.18	205.00
3 October	201.00	130.52	151.00
10 December	181.95	118.15	130.00
1981			
24 April	186.55	121.14	141.00
6 March	201.90	131.10	157.00
14 December	206.50	134.09	153.00
1982			
13 March	217.25	141.07	158.00
24 May	206.50	134.09	146.00
1983			
19 February	191.00	123.77	..
15 October	195.50	126.68	..
30 November	204.50	132.52	..

Source: FEDERACAFE.

Table 13-3 COLOMBIA: TWO MAJOR CONTRIBUTIONS OF COFFEE

Effective Date		The "Reintegro Minimo" US$/70 kg.	Ad-Valorem Tax[1/] %	Retention Quota %
1978				
January	1		16	
April	8	290.00		
June	17	275.00		
July	12	259.00		
1979				
January	25	243.00		
February	1	217.00		
February	22	188.40		
February	27			45
April	19	202.00		
May	5	216.00		55
June	5	251.00		58
1980				
May	9	287.32		62
October	3	201.00		25
December	9		4	
December	10	181.95		
December	11			15
1981				
April	24	186.55		20
September	1		12	
September	18			25
November	6	201.90		30
December	14	206.50		35
1982				
March	13	217.25		39
May	24	206.50		35
October	1		9	40
1983				
February	19	191.00		
September	10		6.5	45
October	15	195.50		50
November	30	204.50		
December	12			58
1984				
February	1			62
March	22	206.00		66

1/ The ad valorem is distributed between the Government and the Coffee sector. Always National Coffee Fund has received 3.2%, Departmental Committees 0.8%, and the rest received by the Government; today, the Government receives 2.5% out of the 6.5%.

Source: FEDERACAFE—Division de Investigaciones Economicas.

The ad valorem tax

A tax equal to 6.5% of the reintegro price is currently payable to the Central Bank in foreign exchange by all exporters of coffee including the Federation. Out of this, an amount equal to 3.2% of total export value is paid by the Bank to the NCF, and another 0.8% (of total export value) is paid to the Departmental Committees to be used for projects in the coffee zone. The remainder is paid into the Special Exchange Account of the Treasury and represents an important contribution to the national revenues, averaging about 7.5% of total government revenues in the period 1974-1981. In the third quarter of 1983 the so-called "reintegro anticipado" was introduced in an effort to induce early surrender of coffee revenues to the Central Bank. The measure provides exporters with a forward exchange rate of up to sixty days for future coffee sales.

The ad valorem tax was introduced in 1967 at the rate of 26 percent as part of the tax reforms which accompanied the abolition of the special rate of exchange for coffee. The rate of the tax was reduced in steps of 0.25 percent per month until it reached the rate of 20 percent in December 1968 at which level it was held until the end of 1974. The rate was then cut by one percentage point in each year from 1975 to 1978 when it fell to 16 percent. Changes in the rate since 1978 are shown in Table 13-3. The loss in revenue from these reductions was borne entirely by the Treasury. Of the portion of the tax received by the NCF, one-fifth passes directly to the campaign for economic and social progress administered by the departmental committees of the Federation.

The discount on currency exchange certificates

When an exporter surrenders the proceeds of coffee sales, in dollars, to the Central Bank, he receives a certificate which in the past--between May 1977 and October 1980--could be redeemed at face value in 120 days, or sold immediately at a discount. This system acted as an indirect tax on coffee exports. As noted earlier, the discount has been eliminated recently.

Table 13-4 contains a brief summary of the evolution of the different taxes on coffee since 1950. As can be seen, the retention tax has been gaining in importance relative to the others in recent years, and now provides almost 70% of total tax revenues.

The Tax System and the Producer's Price

By using the various taxes and prices described above, the Government is able to determine the price received by growers, influence production, and to determine whether growers sell to the Federation or to private exporters. The means by which this is achieved can be seen by considering how a private exporter determines the price which he can pay to growers for deliveries of parchment.

Table 13-4: THE VALUE OF TAXES LEVIED ON AND THE VALUE OF PRODUCTION OF THE COFFEE SECTOR, 1950-1982

(million pesos)

Year	Ad valorem tax	Exchange differential and exchange discount	General export tax	Pasilla and Ripio tax	Retention quota	Total Taxes and contributions	Value of production	Total taxes and contributions as a percentage of the value of production
1950			1.0	0.9		1.9	1,070.1	0.2
1955		14.6	1.3	1.2		17.1	1,825.4	0.9
1960	324.0	94.4	1.3	1.3	212.5	633.5	2,573.8	24.6
1965		613.7	1.2	1.4	242.6	858.9	4,304.0	20.0
1969	1,563.2		1.4	1.4	1,275.2	2,841.2	8,342.1	34.0
1971	1,392.9		1.4	1.4	1,260.1	2,655.8	7,894.5	33.6
1972	1,807.3		1.4	1.4	1,630.8	3,441.9	10,922.8	31.5
1973	2,683.9			1.4	2,424.8	5,110.1	14,497.5	35.2
1974	2,744.0			1.5	3,319.0	6,004.5	17,229.9	35.2
1975	3,402.5			1.8	3,587.5	6,991.8	20,397.8	34.3
1976	6,156.0			1.0	10,071.0	16,228.0	39,251.3	41.3
1977	8,964.0	2,550.0		4.0	20,545.0	32,063.0	65,928.0	48.6
1978	10,878.3	5,397.0		9.6	29,707.2	45,992.1	77,099.0	59.6
1979	12,342.0	5,036.0		4.0	29,846.0	47,228.0	78,764.0	60.0
1980	15,025.0	4,068.0		4.0	31,116.0	50,213.0	99,683.0	50.4
1981[e]	11,468.0	-		4.0	9,597.0	21,069.0	102,000.0	20.7
1982[e]	10,607.0	-		5.0	23,531.0	34,143.0	120,000.0	28.0

e Preliminary estimate.

* Excluding exchange discount.

Sources: Economia Cafetera Colombiana, page 506; Boletin de Informacion Estadistica sobre Cafe No. 48, 1978; and FEDERACAFE sources.

An exporter pays to the Central Bank the foreign exchange which he receives from the sale of coffee and the Bank pays him the equivalent in pesos converted at the current official rate of exchange less the value of the ad valorem tax based on the reintegro price. This amount is paid in the form of currency exchange certificates which the exporter values at below their face value. From this he must deduct the cost of internal transport, grading and warehousing and the minimum amount of profit which he is prepared to accept. The balance which remains is the amount he can pay for the volume of parchment necessary for the export order and for the payment of the retention tax. Division of the balance by this volume--including retention and the amount needed to convert pergamino into excelso--gives the maximum price per unit of parchment which the exporter is prepared to pay. In practice an exporter will take other factors into account when determining this price, such as the small payment received for deliveries of pasilla, but this simplified description serves to show how changes in the rates of the various taxes and the reintegro affect the price which private exporters are prepared to offer, and how these changes can be used to offset changes in world price to keep producers' prices relatively constant.

By setting the minimum price of the Federation above the price which some, or all, exporters can offer or by increasing taxes, thereby forcing the exporter's price below that of the Federation, the Government can induce growers to sell to the Federation and can reduce or eliminate sales to private exporters. Conversely, by setting the Federation price below the price which private exporters can pay, the Government can reduce or eliminate sales to the Federation.

In columns (1) and (2) of Table 13-5 the prices paid by the Federation and by exporters are given for each month since January 1972. In the normal way a grower might be expected to sell his coffee to the buyer offering the higher price. The higher of the prices in columns (1) and (2) may therefore reasonably be considered the market price to growers in each month. This price is given in column (4).

Table 13-5: PRICES TO GROWERS PAID BY THE FEDERATION AND BY PRIVATE EXPORTERS 1972 TO 1983
(Pesos per 125 kg of Federation Type Parchment)

Year	Month	Federation	Private exporters	Difference (1)-(2)	Higher of (1) and (2)
		(1)	(2)	(3)	(4)
1972	Average	1,500	1,508	-8	1,508
	January	1,325	1,320	5	1,325
	February	1,325	1,345	-25	1,345
	March	1,374	1,390	-16	1,390
	April	1,400	1,400	0	1,400
	May	1,406	1,430	24	1,430
	June	1,459	1,470	-11	1,470
	July	1,544	1,600	-36	1,600
	August	1,610	1,630	-20	1,630
	September	1,610	1,620	-10	1,620
	October	1,621	1,620	5	1,621
	November	1,655	1,620	35	1,655
	December	1,655	1,650	5	1,655
1973	Average	1,937	1,891	46	1,940
	January	1,709	1,720	-11	1,720
	February	1,775	1,745	30	1,775
	March	1,903	1,840	63	1,903
	April	1,985	1,850	35	1,985
	May	1,985	1,940	45	1,985
	June	1,985	2,000	-15	2,000
	July	1,985	1,925	60	1,985
	August	1,985	1,950	35	1,985
	September	1,985	1,900	85	1,985
	October	1,985	1,940	45	1,985
	November	1,985	1,920	65	1,985
	December	1,985	1,960	25	1,985
1974	Average	2,207	2,369	-162	2,369
	January	1,985	2,190	-203	2,190
	February	1,965	2,350	-355	2,350
	March	1,985	2,300	-315	2,300
	April	2,179	2,350	-171	2,350
	May	2,262	2,350	-87	2,350
	June	2,263	2,376	-113	2,376
	July	2,263	2,300	-37	2,300
	August	2,263	2,346	-83	2,346
	September	2,263	2,394	-131	2,394
	October	2,263	2,442	-179	2,442
	November	2,281	2,491	-210	2,491
	December	2,491	2,542	-51	2,542

1975	Average	2,730	2,934	-339	2,934
	January	2,500	2,596	-96	2,596
	February	2,500	2,492	8	2,500
	March	2,500	2,406	94	2,500
	April	2,435	2,256	179	2,256
	May	2,350	2,500	-150	2,500
	June	2,350	2,561	-211	2,561
	July	2,560	2,833	-233	2,833
	August	3,000	4,143	-1,143	4,143
	September	3,000	3,551	-551	3,551
	October	3,065	3,442	-367	3,442
	November	3,250	3,496	-246	3,496
	December	3,250			
1976	Average	5,533	5,828	-295	5,828
	January	3,496	4,131	-635	4,131
	February	3,845	4,528	-683	4,528
	March	4,120	4,430	-310	4,430
	April	4,495	5,356	-861	5,356
	May	4,495	6,115	-1,620	6,115
	June	6,079	6,669	-590	6,669
	July	6,560	6,221	-340	6,560
	August	6,560	6,283	277	6,560
	September	6,560	6,271	289	6,560
	October	6,560	6,225	335	6,560
	November	6,619	6,479	140	6,619
	December	7,000	7,200	200	7,200
1977	Average	7,179	6,946	233	7,179
	January	7,000	7,445	-445	7,445
	February	7,000	7,371	-371	7,371
	March	7,000	7,541	-541	7,541
	April	7,000	7,291	-291	7,291
	May	7,048	6,589	459	7,048
	June	7,300	6,524	776	7,300
	July	7,300	6,560	740	7,300
	August	7,300	6,828	472	7,300
	September	7,300	6,869	431	7,300
	October	7,300	6,645	655	7,300
	November	7,300	6,839	461	7,300
	December	7,300	6,849	451	7,300
1978	Average	7,300	6,946	354	7,300
	January	7,300	7,008	292	7,300
	February	7,300	7,001	299	7,300
	March	7,300	6,921	379	7,300
	April	7,300	6,991	309	7,300
	May	7,300	6,923	377	7,300
	June	7,300	6,938	362	7,300
	July	7,300	6,905	395	7,300
	August	7,300	7,009	291	7,300
	September	7,300	7,073	227	7,300
	October	7,300	6,960	340	7,300
	November	7,300	6,849	451	7,300
	December	7,300	6,773	527	7,300

1979	Average	7,270	7,179	91	7,270
	January	7,300	6,920	380	7,300
	February	7,236	6,860	376	7,236
	March	6,400	6,150	250	6,400
	April	6,400	6,363	37	6,400
	May	6,574	6,578	-4	6,578
	June	6,946	6,955	-9	6,955
	July	7,143	7,110	33	6,143
	August	7,340	7,276	64	7,340
	September	7,714	7,759	-45	7,759
	October	7,900	7,919	-19	7,919
	November	8,066	8,076	-10	8,076
	December	8,216	8,185	31	8,216
1980	Average	8,663	8,528	135	8,663
	January	8,300	8,305	-5	8,305
	February	8,300	8,333	-33	8,333
	March	8,356	8,450	-94	8,450
	April	8,733	8,761	-28	8,761
	May	8,733	8,763	-30	8,763
	June	8,733	8,484	249	8,733
	July	8,733	8,313	420	8,733
	August	8,733	8,345	388	8,733
	September	8,733	8,318	415	8,733
	October	8,733	8,665	68	8,733
	November	8,733	8,675	58	8,733
	December	9,140	8,898	242	9,140
1981	Average	9,453	9,271	182	9,453
	January	9,200	8,893	307	9,200
	February	9,200	8,861	339	9,200
	March	9,200	9,036	164	9,200
	April	9,200	9,100	100	9,200
	May	9,200	9,000	200	9,200
	June	9,200	8,893	307	9,200
	July	9,200	9,156	44	9,200
	August	9,200	9,380	-180	9,380
	September	9,460	9,310	150	9,460
	October	9,800	9,673	127	9,800
	November	10,241	9,956	285	10,241
	December	10,330	10,000	330	10,330

1982	Average	11,171	11,003	168	11,171
	January	10,330	10,166	164	10,330
	February	10,330	10,214	116	10,330
	March	10,795	10,619	176	10,795
	April	11,050	10,868	182	11,050
	May	11,050	10,770	280	11,050
	June	11,050	10,930	120	11,050
	July	11,050	10,913	137	11,050
	August	11,050	10,891	159	11,050
	September	11,050	10,923	127	11,050
	October	12,100	11,839	261	12,100
	November	12,100	11,963	137	12,100
	December	12,100	11,935	165	12,100
1983	Average				
	January	12,100	12,095	5	12,100
	February	12,100	12,156	-56	12,156
	March	12,100	12,102	-2	12,100
	April	12,800	12,460	340	12,800
	May	12,800	12,363	437	12,800
	June	12,800	12,563	237	12,800
	July	12,800	12,543	257	12,800
	August	12,800	12,615	185	12,800
	September	13,900	13,151	749	13,900
	October	14,150	..	..	..
	November	14,150	..	..	..
	December	14,400			
1984	March	14,800	..	..	..

Source: FEDERACAFE.

The Recipients of Coffee Taxes

Of the total taxes and levies on the export of coffee, more than two-thirds in recent years have gone to the National Coffee Fund which obtains its revenues entirely from taxation on coffee. The whole of the retention tax is received by the Fund and the share of the Fund from all forms of taxation on coffee has tended to increase as this tax has gained in importance relative to the ad valorem tax which, apart from the tax implicit in the system of currency exchange certificates, is the only indirect tax on the coffee sector received by the Government.[2/] Total proceeds and their distribution are shown in Table 13-6.

Table 13-6: THE PROCEEDS OF TAXES ON COFFEE AND THEIR DISTRIBUTION (as % of total)

	Total Taxes and Levies (million pesos)	National Coffee Fund	Departmental Committees of FEDERACAFE	National Government
1974	6,064	62.9	1.8	35.3
1975	6,992	58.5	2.1	38.4
1976	16,228	68.8	1.7	29.5
1977	32,063	69.3	1.3	29.4
1978	45,992	69.0	1.0	30.0
1979	47,228	68.0	1.0	30.0
1980	50,213	68.0	2.0	30.0
1981[a/]	21,069	59.0	3.0	38.0
1982[a/]	34,143	83.9	2.3	13.8

a/ Excluding exchange discount.

Source: FEDERACAFE

2/ Note, however, that the value of the retention tax to the Federation and the National Coffee Fund is not realized until the coffee is sold. The bags of coffee received as retention tax, but never sold, are of no value. The figures in Table 13-6 were computed on the assumption that the coffee delivered to the Federation as retention tax should be valued at its market value. To the extent that this coffee has a true value less than its market value, these figures over-estimate the total taxes and the shares of the NCF and Departmental Committees. On the other hand, the Government's tax is received in cash, so its share tends to be under-estimated in this table.

ANNEX 14

INTERNATIONAL COFFEE AGREEMENT[1/]

A. Background

Before World War II, there was no international action on coffee because Brazil, then accounting for about two-thirds of world production, followed a strong price support policy on its own. Other producing countries benefited from this policy and thus saw no reason to undertake international action.

World War II, which precluded producers from shipping coffee to the European market, created the prospect of huge oversupplies. In the face of this situation an Inter-American Coffee Agreement was signed by the United States and 14 Latin American producers, and entered into force in April 1941. Its main economic measure in support of coffee prices was a system of export quotas. Initially the system was effective, but towards the end of the war, quotas were set so liberally that its effect was drastically diminised.

Declining world coffee prices, starting in the mid-1950s, created a situation which led again to international action. After some attempts by producing countries to regulate the market on their own, an International Coffee Agreement (ICA) was signed in 1962 by a large group of consuming and producing countries. It entered into force in October 1963. Its main market regulatory instrument was an export quota system. This Agreement succeeded in halting the declining price trend; prices started to increase in nominal terms, although they remained stagnant in real terms. With strong market prospects in the early 1970s, producing countries pressed for higher prices and lower overall quotas than importing countries were willing to accept. Producers and consumers were not able to reach an agreement and no regulation of the coffee market under the International Coffee Agreement was in force after 1973.

The ICA 1962, (followed by the ICA 1968) was extended until September 1976 when a new agreement, the International Coffee Agreement, 1976, was concluded. The ICA 1976 differs from the previous one in that both the Diversification Fund and the requirement of producers to submit production policy plans to the Organization were dropped; furthermore, the quotas for each country are determined not only on the basis of past export performance but also on the basis of the stocks held by each of them.

Main Features of the ICA, 1976

Like the other ICAs before it, the ICA 1976 is an export quota agreement. It differs, therefore, from the new International Cocoa Agreement which has a buffer stock as the main market regulatory instrument.

1/ Reproduced from Commodity Handbook--Coffee, IBRD, 1982; it supports the discussion in Chapter 6.

The Agreement has as members producing countries that account for over 99% of world net exports and importing countries that account for about 90% of world net imports. Important non-member importing countries are the Eastern European countries, the USSR and some countries in North Africa and the Middle East. Consumers and producers as blocks have equal votes (1,000 each) in the Executive Board of the Agreement. Within each block, votes are allocated on the basis of the relative importance of each country as a producer or consumer of coffee. Two key elements of the Agreement's economic provisions, i.e. export quotas and trigger prices, are described below.

(i) Export Quotas. The Council, which is the highest authority in the International Coffee Organization (ICO), sets a global annual quota for each coffee year. In seting the global annual quota, factors taken into account include annual consumption and estimated changes in the level of inventories in importing member countries.

For the allotment of the global quota among the individual exporting countries, small exporters are allotted fixed export quotas while larger exporters are allotted "basic quotas" which serve as the basis for determining their export quotas. The size of fixed quotas for countries exporting less than 400,000 bags for the coffee year (October to September) 1976/77 was specified for each country in an Annex to the Agreement. These quotas were to be increased by 10% each year for those countries whose initial quota is less than 100,000 bags and by 5% each year for those countries whose initial quota is between 100,000 and 400,000 bags. For countries exporting more than 400,000 bags, the quotas are calculated on the basis of "basic quotas" derived from recent annual averages of exports, and variable parts, distributed in proportion to verified stocks in producer countries.

(ii) Trigger Prices. For the purpose of introducing, suspending or reintroducing quotas, an indicator price, a composite price reflecting the overall world coffee price, is calculated daily. The export quota is introduced when the 15-day moving average composite indicator price falls below the floor of the price range agreed by the Council or in case when there are no agreed price range when it falls 15% or more below the average for the previous year. Quotas are suspended when the 15-day moving average composite price goes above the agreed ceiling price or if there are no agreed ceiling price when it is 15% or more above the previous year's average. Within a coffee year, the Council may adjust the annual and quarterly quotas if it finds the market situation so requires.

Impact of the Recent Implementation of the Quota on the Market

World coffee prices started declining in June 1980 and by October 1980 were about 25% below their June level. The International Coffee Council met in September 1980 to introduce export quotas to halt the declining price

trend. The ceiling and floor prices were set at USc155/lb. and USc115/lb. respectively. The initial global quota set for the 1980/81 coffee year was 58.19 million bags of 60 kg each. It was decided by the Council in October 1980 that the global quota would be cut by 1.4 million bags each time the composite indicator price went below a certain level.

The indicator price fell below USc115/lb. in June 1981, which was the floor price at the time, resulting in an ICO Executive Board decision to apply the 4th quota cut, thus reducing the global quota to 51.8 million bags.

The sharply declining price trend that lasted until mid-1981, despite implementation of export quotas, is surprising, given that the global quota level was substantially below the export level of recent years, and coffee supplies were tight in mid-1981. The main explanation for declining prices, despite the low global quota, seems to have been the market expectation that, with substantial increases in world coffee supply for the 1981/82 season, especially from Brazil, either the members of ICA would be unable to agree on a global quota level for the 1981/82 season or the global quota decided on would be so generous that it would not have any impact on the market. Other reasons for the declining prices include the recession in the industrial economies and the high interest rates in most of the industrialized countries which make stock holding of coffee quite costly. This recent experience with export quotas shows that the price support effect of the quota system is quite limited when the medium to long-term fundamentals of the market are weak.

The declining price trend during the summer of 1981 was halted and prices increased in August and September because of the severe frost that ocurred in Brazil in late July and the recent decision of the ICO members to limit the global export quota for the 1981/82 coffee season to a level of 56 million bags, which is lower than last season's initial quota. Further, the quota for the first quarter of the 1981/82 coffee year was set at an annual rate of 52 million bags--equivalent to the quota level in the 4th quarter of the 1980/81 coffee year. This reduction in quota should increase the stocks in producing countries, which will then be available to compensate for Brazil's production decline in the 1982/83 season.

ANNEX 15

TRENDS IN PRODUCTION OF MAJOR AGRICULTURAL CATEGORIES*

The real value of gross output within agriculture has varied distinctly for the various products during 1970/72-1979/81, the smallest increase taking place in animal production, 47%, and the largest in coffee, 71%. The real value of gross sugar output went up by 68% and that for other agricultural products by 50%. The largest increase in physical production has taken place in cereals, 65%, from 2 million tons in 1970/72 to 3.3 million tons in 1980/82, mainly due to a more than doubling of the production of rice, from 860 thousand tons in 1970/72 to 1.8 million tons in 1980/82. The performance of sorghum has also been outstanding with its output almost trebling between 1970/72 and 1980/82, from 189 to 513 thousand tons. For the remainder of cereals, output has remained relatively constant or has grown at a very slow pace. There has been a 50% fall in barley output in 1981 and 1982, with no clear trend for the 1970s despite a considerable but shortlived upward movement in output at the end of the past decade. After a decline in production during the first half of the 1970s, corn production has peaked in the last two years increasing by 10% in 1980/82 compared to 1970/72. Finally, wheat production has been recovering in the last three years, but it is still at the same level as it was at the beginning of the 1970s.

Oilseed production has been stagnant throughout the 1970s and 1980s, despite the phenomenal success of cotton in the mid-1970s. This disappointing behavior can be attributed entirely to a fall in cotton output, in part owing to the conditions prevailing in the international markets, as well as to internal conditions which have increased the general price level and costs of production, thereby putting it out of the market. Although there has been a declining trend in cotton production since 1977, there was a substantial decline in output of fiber between 1981 and 1982, when it dropped from 121.2 to 52.1 thousand tons. Sugar production increased by 60% between 1970/72 and 1980/82, most of it due to a 54% increase in area planted of sugar cane. As for brown block sugar, output also went up by 80% between 1970/72 and 1980/82, while area planted stayed constant, thereby implying an increase in yields of 80%; however, this astonishing result cannot be properly supported, and it seems to stem from a serious mistake in statistics made between 1974 and 1975 rather than from actual performance.

A more than doubling of potato output between 1970/72 and 1980/82, from 885 to 1,994 thousand tons, and a stagnant output of cassava led to a 30% increase in tuber output. The sharp increase in potato output is due to an increase in area, 75%, rather than to an increase in yields, 28%; the latter is the result of improved management techniques and higher levels of fertilization and mechanization.[1]/ Bean output went up by 70% between

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* This annex is taken from Garcia-Garcia, op. cit.

1/ See DNP, "L. Economia de la Papa en Colombia," Revista de Planeacion y Desarrollo (January/April 1979), pp. 69-110.

1970/72 and 1980/82, as a result both of expansion in area, 55%, and a very small increase in yields, 10%. The information available until 1982 shows, however, that output trebled between 1970 and 1982 and it attributes such outcome to a massive increase in yield of 77% between 1980 and 1981. This result cannot be adequately documented and is probably the result of statistical inaccuracies rather than of actual performance.

There are three kinds of tobacco grown in Colombia: black for the domestic market; black for export and burley. By and large production of black tobacco has remained stagnant between 1970/72 and 1981/82, but it experienced wide fluctuations within the period. Area planted in tobacco has decreased and yields stayed relatively constant, although they seem to have increased substantially in 1981/82. The increase in yield appears to be rather suspect, since, as in the case of beans and brown block sugar, there are no developments to support this outcome. In fact, tobacco is grown on small plantations by farmers who use traditional technologies and, to a limited degree, modern inputs or new varieties of tobacco.[2/] Production and yield of burley may have increased more significantly.

Important technological developments took place in the production of banana destined for export and of coffee. With regard to banana, there has been a high and sustained growth in yields--9.3% per year between 1970/72 and 1980/82--due to the introduction of new varieties, increased fertilization and irrigation as well as to improvements in farm management. These developments led to a trebling of banana production for export with a relatively small increase in area planted per annum--3.0% per year between 1970/72 and 1980/81. As for plantains produced for domestic consumption, the information available on output and area planted is not very reliable and not much can be said about it. However, it is well known that little research on the development of new varieties or improvements in farm management techniques is carried out, as would be the generation of important technological developments for this product. Moreover, most of the production for the domestic market is done by small farmers ('minifundio') or in way of home production ('huertas caseras'), both for human consumption and animal feed.[3/] Therefore, the chances of devising and adopting major technological improvements are very slim. Hence, any increase in output of plantains must be the result of an expansion in area planted rather than of an increase in yields. In coffee, output increased 50% between 1970/72 and 1980/82, but the increase actually took place since 1976, when new dwarf varieties (caturra coffee) began to bear fruit. These varieties, which are high-yielding, permitted an increase in output without any significant expansion in area during the period as a whole. Moreover, with the boom in coffee prices, increased fertilization became more profitable, thus raising yields; with the decline in these prices, fertilization and maintenance of coffee plantations have been reduced owing to a decrease in profitability, thereby reducing productivity which, nonetheless, is still higher than it was in the past.

2/ See DNP, "La Industria del Tabaco," Revista de Planeacion y Desarrollo (May/August 1979), pp. 163-167.

3/ ICA, Sector Agropecuario Colombiano: Diagnostico Tecnologico, Documento de Trabajo No. 78, January 1980, Chapter 5.

Livestock has been the slowest-moving sector of agriculture. Its output, expressed in 1975 pesos, increased by 46% between 1970/72 and 1979/81, while the number of hectares used for cattle raising increased by 20%. According to this information, and for the time-span under consideration, the increase in productivity measured in constant 1975 pesos, comes to a low 22%. This low productivity measure is consistent with the information available on indices of physical productivity for the Colombian livestock sector. Extraction rates are low and static, and weight per animal and birth rates are low by international standards. Thus, the extraction rate is around 11%, much lower than the 20 and 18% had in Argentina and Uruguay; in Colombia it takes 3.5 to 4 years for an animal to reach a weight of 400 kilograms, while in Argentina it only takes 2.5 years. Moreover, birth rates are 55% for beef cattle and 68% for milk cattle, these birth rates fluctuating between 80 and 90% in developed countries.[4/] The limiting factors of productivity in the Colombian livestock sector have been the lack of genetic improvement, feedstuff, health and management.[5/] Despite this low productivity, the Colombian livestock sector is efficient--in the economic sense--since the present structure of relative factor prices favors the adoption of the relatively backward technologies used at the present time;[6/] for example, only in the Savanna of Bogota, some areas of Valle del Cauca and Piedemente Llanero, where the relative price of land is high, have new pasture varieties been adopted.[7/]

Another classification of agricultural crops commonly used classifies them as traditional crops, because of the rather backward technology used in their cultivation, food raw materials, non-food raw materials, export crops and rice.[8/] With this grouping, the area planted in traditional crops

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4/ See DNP, "La Economia Ganadera en Colombia," Revista de Planeacion y Desarrollo (September/December 1980), pp. 108-110.

5/ ICA, op. cit., p. 630.

6/ L. Currie, "La Industria Ganadera" in Sociedad de Agricultores y Ganaderos del Valle--Fondo Ganadero del Valle del Cauca--La Ganaderia de Carne en Colombia, pp. 16-27, and J. Garcia Garcia, The Economics of the Livestock Sector in Colombia: 1957-1977, mimeo, IFPRI--Washington, 1980.

7/ DNP--UEA, op. cit., p. 111.

8/ Traditional crops comprise wheat, pulses, fruits, vegetables, potatoes, corn, cassava, plantain and brown block sugar; food raw materials include soybeans, sorghum, sesame, sugar, barley, palm and cocoa; non-food raw materials are cotton and tobacco; and export products comprise coffee and bananas. See DNP, Diagnostico del Sector Agrario, Tomo I (mimeographed), 31 January 1983, Table 10.

iucreased by 8% and that in non-food raw materials declined by 15% from 1970/72 to 1979/81; on the other hand, yields from traditional crops increased by around 15%, while those from non-food raw materials went up by 10%, but with substantial variations throughout the period under study. This tendency of low yield increases is also clearly evident with regard to rice, where yields went up by 16%; however, yields from the production of rice are among the highest in the world, and most productivity gains took place in the late 1960s. As for food raw materials, yields went up by 20% and the largest gain is observed in export products, where yields increased by 50% on the average; this increase in yields from export products is not only owing to coffee, which went up by 40% after 1973/75, but also to bananas which increased by 140% from 1970/72 to 1980/82.

ANNEX 16

AGRICULTURAL STATISTICS

Statistical Weaknesses and Reform

1. Methods employed to generate and utilize agricultural data deteriorated significantly during the 1970s, and at present Colombian agricultural statistics are in dire need of improvement. In comparison to the first complete agricultural census of 1960, the census carried out in 1970--partly for financial reasons--employed an inadequate sampling method, the universe surveyed remained incomplete, and only a part of the results were published. Plans for performing complementary surveys of the sector following the census also were abandoned. Instead, systematic surveys and measurements of production and area under cultivation began to be increasingly replaced by a process of "statistical consensus", whereby agreements are reached at the departmental level on the size of output based on the views of cultivators, suppliers of inputs and purchasers of output, and the departmental estimates are then summed up at the national level. The weaknesses in this procedure are particularly acute in the case of food crops, such as cassava, plantains, fruits and vegetables, which do not utilize major organized channels of input provision, and for which strong producer associations do not exist. On the other hand, crop estimates for processed commodities and export items such as coffee, cotton, sugar and rice are relatively reliable. In the case of coffee, FEDERACAFE carried out a census of area and production in 1980, based on aerial photography, which has provided a sound basis for coffee data.

2. Plans for a more general agricultural census in 1980, including one for livestock, have been postponed, partly because of resource constraints, and partly because DANE has given greater priority to population and housing censuses, and because the statistical institute has not been able to agree with the Ministry of Agriculture on a census methodology. In fact, a clear definition of institutional responsibility for leadership in agricultural statistics is yet to be developed, although the Ministry of Agriculture is beginning to take the lead in this area. DANE has found that agricultural data development is costly in Colombia, and statistical work in non-agricultural areas is more quick-yielding, which has turned out to be an important consideration particularly in view of severe resource constraints.

3. A variety of statistical sources exist at present which can provide some measure of cross checks on available crop statistics and give alternative indications on sectoral performance. Price data are fairly well-developed, although statistics from alternative sources--DANE, Banco de la Republica, Ministry of Agriculture, IDEMA and various producer associations--should be interpreted with caution with respect to definition of the markets, quality of products, locations and time periods. Particularly noteworthy is progress made in agricultural data compilation and use under the revisions made in national accounting procedures of DANE.

4. Nothwithstanding the statistical weaknesses noted above, there is a strong interest on the part of the Colombian authorities and technicians to improve the data base in agriculture. A small experimental project under

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* This annex was taken from a paper by A. Merediz-Montero (FAO/CP).

the auspices of FAO assistance is underway to carry out systematic sample surveys of areas under cultivation in selected places. This survey needs to be expanded to other areas, and the scope of the work augmented to include production surveys and output projections. Available funds under FAO assistance could only cover the planning and design of future work on nation-wide production surveys, and financial assistance for setting up the actual work on a continuous basis will be needed.

STATISTICAL TABLES

Table 1 COLOMBIA: GROSS DOMESTIC PRODUCT BY TYPE OF EXPENDITURE AT CURRENT MARKET PRICES, 1960-82

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Gross Domestic Product at m.p.	26,746.7	30,421.0	34,199.2	43,525.5	53,760.3	60,797.6	73,612.3	83,082.7	96,421.7	110,953.3
Gross Domestic Consumption	21,248.6	24,600.5	27,955.7	36,173.8	44,951.2	49,436.4	60,753.0	67,312.8	77,275.4	89,510.2
Private Consumption	(19,589.3)	(22,584.5)	(25,699.7)	(33,024.8)	(41,467.6)	(45,482.1)	(55,842.6)	(61,596.0)	(70,695.6)	(81,677.4)
Government Consumption	(1,659.3)	(2,016.0)	(2,356.0)	(3,149.0)	(3,483.6)	(3,954.3)	(4,910.4)	(5,716.8)	(6,579.8)	(7,832.8)
Gross Domestic Investment	5,494.8	6,335.0	6,404.7	7,844.5	9,602.0	10,742.2	15,040.4	15,341.0	20,406.2	22,715.2
Gross Fixed Investment	(4,844.9)	(5,580.3)	(6,136.9)	(7,167.5)	(8,653.8)	(9,504.2)	(12,303.6)	(14,729.1)	(18,815.1)	(21,230.1)
Change in Stocks	(649.9)	(754.7)	(267.8)	(677.0)	(948.2)	(1,238.0)	(2,736.8)	(611.9)	(1,591.1)	(1,485.1)
Exports of Goods & NFS	4,163.9	3,920.2	4,146.6	5,173.5	6,376.5	6,943.5	8,916.5	9,950.3	12,519.6	14,675.1
Imports of Goods & NFS	4,160.6	4,434.7	4,407.8	5,666.3	7,169.4	6,324.5	11,097.6	9,521.4	13,779.5	15,947.2
Net Factor Income from Abroad	-302.3	-394.6	-499.9	-811.4	-797.4	-897.6	-1,242.9	-1,470.7	-2,003.2	-2,676.5
Gross National Product at m.p.	26,444.4	30,026.4	33,699.3	42,714.1	52,962.9	59,900.0	72,369.4	81,612.0	94,418.5	108,276.8

Note: Exports and imports of Goods and NFS and Net Factor Income are balance of payments figures converted to Colombian pesos by IBRD staff. The exchange rate used in the conversion is an annual average of the implicit rates of daily customs declarations provided by Banco de la Republica. The private consumption item is a residual in the account. Gross National Product is derived as the difference between GDP and Net Factor Income from Abroad.

Source: Banco de la Republica

Table 1 COLOMBIA: GROSS DOMESTIC PRODUCT BY TYPE OF EXPENDITURE AT CURRENT MARKET PRICES, 1960-82
(millions of Colombian Pesos)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Preliminary estimate 1982
Gross Domestic Product at m.p.	130,361.0	152,262.8	186,092.3	243,235.9	329,155.4	412,828.7	534,015.3	718,474.5	916,559.7	1,195,379.5	1,595,154.6	2,033,892.1	2,542,867.1
Gross Domestic Consumption	104,446.0	123,770.6	149,497.9	199,580.8	260,330.8	335,234.1	406,370.5	524,955.1	684,943.3	897,677.5	1,190,943.9	1,563,409.4	1,989,360.0
Private Consumption	(94,484.0)	(110,342.0)	(134,848.7)	(180,566.5)	(237,172.5)	(304,809.2)	(367,640.1)	(476,801.2)	(619,219.0)	(806,556.5)	(1,058,439.6)	1,386,219.5)	(1,760,642.3)
Government Consumption	(9,962.0)	(13,428.6)	(14,649.2)	(19,014.3)	(23,158.3)	(30,424.9)	(38,730.4)	(48,153.9)	(65,724.3)	(91,120.0)	(132,504.3)	(177,189.9)	(228,717.7)
Gross Domestic Investment	28,660.0	34,585.2	37,739.3	40,764.6	74,279.5	73,599.9	111,353.4	169,139.6	208,942.4	269,192.0	401,336.1	552,914.1	655,330.0
Gross Fixed Investment	(26,441.0)	(31,603.7)	(34,520.4)	(42,534.6)	(63,860.3)	(77,572.1)	(97,081.3)	(134,784.0)	(187,721.1)	(243,041.3)	(347,640.9)	(441,805.5)	(552,688.0)
Change in Stocks	(2,219.0)	(2,981.5)	(3,218.9)	(-1,770.0)	(10,419.2)	(-3,972.2)	(14,272.1)	(34,355.6)	(21,221.3)	(26,150.7)	(53,695.2)	(111,108.6)	(102,642.0)
Exports of Goods & NFS	18,420.0	19,080.0	25,217.1	36,083.9	47,360.4	64,062.4	94,416.3	123,259.4	151,122.0	190,900.0	250,330.6	228,512.2	269,931.5
Imports of Goods & NFS	21,165.0	25,173.0	26,362.0	33,193.4	52,815.3	60,067.7	78,124.9	98,879.6	128,448.0	162,390.0	247,456.0	310,943.6	371,754.4
Net Factor Income from Abroad	-3,316.0	-3,448.0	-4,239.4	-5,012.0	-4,894.1	-7,782.2	-10,535.6	-9,737.6	-11,375.0	-10,582.0	-10,055.0	-23,322.0	-44,935.5
Gross National Product at m.p.	127,045.0	148,814.8	181,852.9	238,223.9	324,261.3	405,046.5	523,479.7	708,736.9	905,184.7	1,184,797.5	1,585,099.6	2,010,570.1	2,497,931.6

Note: Exports and imports of Goods and NFS and Net Factor Income are balance of payments figures converted to Colombian pesos by IERD staff. The exchange rate used in the conversion is an annual average of the implicit rates of daily customs declarations provided by Banco de la Republica. The private consumption item is a residual in the account. Gross National Product is derived as the difference between GDP and Net Factor Income from Abroad.

Source: Banco de la Republica

Table 2 COLOMBIA: GROSS DOMESTIC PRODUCT BY TYPE OF EXPENDITURE AT CONSTANT MARKET PRICES, 1960-82
(millions of 1970 Colombian Pesos)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Gross Domestic Product at m.p.	78,085.8	82,193.7	86,685.9	89,206.5	95,095.2	97,797.7	103,348.8	107,628.2	114,558.8	121,775.3
Gross Domestic Consumption	58,626.6	62,371.8	67,529.7	70,973.6	76,877.7	76,475.7	83,181.8	84,592.4	89,488.4	96,536.2
Private Consumption	(53,155.2)	(56,599.9)	(61,275.8)	(64,359.5)	(70,174.6)	(69,349.4)	(75,737.3)	(76,759.9)	(81,384.7)	(87,831.8)
Government Consumption	(5,471.4)	(5,771.9)	(6,253.9)	(6,614.1)	(6,703.1)	(7,126.3)	(7,444.5)	(7,832.5)	(8,103.7)	(8,704.4)
Gross Domestic Investment	17,375.1	19,127.5	17,850.2	17,238.9	19,514.0	18,886.1	22,157.8	20,100.2	24,147.0	24,514.9
Gross Fixed Investment	(15,809.1)	(17,152.6)	(17,217.3)	(15,840.5)	(17,824.2)	(16,831.6)	(18,181.4)	(19,386.5)	(22,290.5)	(22,847.2)
Change in Stocks	(1,566.0)	(1,974.9)	(632.9)	(1,398.4)	(1,689.8)	(2,054.5)	(3,976.4)	(713.7)	(1,856.5)	(1,667.7)
Exports of Goods & NFS	13,638.9	12,729.3	13,760.4	13,428.3	14,210.2	15,138.8	14,878.1	16,179.0	17,527.5	18,351.1
Imports of Goods & NFS	11,554.8	12,034.9	12,454.4	12,434.3	15,506.7	12,702.9	16,868.9	13,243.4	16,604.1	17,626.9
Net Factor Income from Abroad	-882.6	-1,290.5	-1,267.2	-1,662.9	-1,410.4	-1,443.9	-1,744.9	-1,905.2	-2,380.0	-2,937.5
Gross National Product at m.p.	77,203.2	80,903.2	85,418.7	87,543.6	93,684.8	96,353.8	101,603.9	105,723.0	112,178.8	118,837.8

Note: Exports and imports of Goods and NFS and Net Factor Income are balance of payments figures deflated by IBRD staff using price indices based on dollar value and volume of exports and imports and the International Price Index (IPI). Private consumption is a residual item in the account.

Gross National Product = Gross Domestic Product + Net Factor Income from abroad

Source: Banco de la Republica

Table 2 COLOMBIA: GROSS DOMESTIC PRODUCT BY TYPE OF EXPENDITURE AT CONSTANT MARKET PRICES, 1960-82
(millions of 1970 Colombian Pesos)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Preliminary estimate 1982	Least Square Growth Rate 1970-80	Least Square Growth Rate 1981-82
Gross Domestic Product at m.p.	130,361.4	137,889.0	148,629.5	159,194.7	168,786.9	175,225.9	183,296.1	192,187.0	209,368.5	220,091.2	229,271.1	235,006.9	238,297.0	5.8	1.4
Gross Domestic Consumption	104,445.1	111,387.7	118,907.2	131,916.6	138,381.5	143,015.0	147,477.3	154,805.8	168,563.5	176,233.5	184,126.0	189,568.4	192,599.8	5.7	1.6
Private Consumption	(94,483.5)	(99,581.5)	(107,574.5)	(119,685.2)	(126,395.6)	(130,296.5)	(133,972.6)	(140,819.2)	(153,218.5)	(159,731.5)	(165,899.3)	(170,046.8)	(172,375.4)	5.8	1.4
Government Consumption	(9,961.6)	(11,806.2)	(11,332.7)	(12,231.4)	(11,985.9)	(12,718.5)	(13,504.7)	(13,986.6)	(15,345.0)	(16,502.0)	(18,226.7)	(19,521.6)	(20,224.4)	5.1	3.6
Gross Domestic Investment	28,660.3	30,767.3	30,193.3	26,836.6	35,651.6	29,460.9	36,856.8	42,020.2	42,647.0	43,813.7	52,625.5	59,408.3	57,585.7	6.0	-3.1
Gross Fixed Investment	(26,440.8)	(28,066.6)	(27,786.2)	(29,151.6)	(31,700.0)	(31,843.7)	(32,801.6)	(34,487.1)	(38,736.8)	(39,719.3)	(45,293.8)	(46,704.8)	(47,638.9)	5.1	2.0
Change in Stocks	(2,219.5)	(2,700.7)	(2,407.1)	(-2,315.0)	(3,951.6)	(-2,382.8)	(4,055.2)	(7,531.1)	(3,910.2)	(4,094.4)	(7,331.7)	(12,703.5)	(9,946.8)	-	-21.7
Exports of Goods and N.F.S.	18,420.0	18,826.0	19,588.0	20,208.0	18,971.0	24,617.0	22,582.0	21,586.0	28,115.0	31,392.0	32,360.3	27,464.1	25,816.3	5.7	-6.0
Imports of Goods and N.F.S.	21,164.0	23,092.0	20,059.0	19,766.5	24,217.2	21,867.0	23,620.0	26,225.0	29,957.0	31,338.0	39,840.7	41,433.9	37,704.8	5.7	-9.0
Net Factor Income from Abroad	-3,315.6	-2,996.2	-3,029.0	-2,787.0	-2,007.2	-2,403.0	-2,811.1	-2,250.0	-2,104.1	-1,555.3	-1,619.0	-3,101.0	-4,349.1	-7.0	-127.7
Gross National Product at m.p.	127,045.8	134,892.8	145,600.5	156,407.7	166,779.7	172,822.9	180,485.0	189,937.0	207,264.4	218,535.9	227,652.1	231,905.9	233,947.9	6.0	0.8

Note: Exports and imports of Goods and NFS and Net Factor Income are balance of payments figures deflated by IBRD staff using price indices based on dollar value and volume of exports and imports and the International Price Index (IPI). Private consumption is a residual item in the account.

Gross National Product = Gross Domestic Product + Net Factor Income from abroad

Source: Banco de la Republica

Table 3 COLOMBIA: GROSS DOMESTIC PRODUCT AT FACTOR COST BY SECTOR AT CURRENT PRICES, 1960-82
(millions of Colombian Pesos)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Gross Domestic Product at F.C.	25,073.3	28,674.3	32,450.5	41,294.1	50,457.2	56,893.4	67,892.4	76,940.5	88,763.5	101,736.2
Agriculture a/	8,553.0	9,525.8	10,149.6	12,506.4	16,623.8	17,675.7	20,742.9	23,269.4	26,875.2	30,208.6
Mining	985.6	995.3	991.9	1,229.0	1,394.7	1,551.8	1,468.3	1,566.6	2,149.3	2,514.0
Manufacturing	4,335.3	4,962.6	5,933.8	7,986.9	9,015.3	10,386.3	12,357.8	13,272.3	14,917.1	17,208.1
Construction	909.4	1,139.9	1,416.8	1,607.7	1,826.7	2,080.7	2,832.6	3,792.7	4,565.3	5,427.7
Electricity, Gas and Water	227.2	247.3	357.9	463.7	566.9	740.2	871.0	1,159.5	1,325.5	1,515.0
Transportation and Communication	1,647.8	1,869.0	2,333.6	3,031.0	3,390.1	3,596.8	4,457.7	5,049.7	6,013.3	7,310.7
Trade b/	3,929.9	4,431.7	5,051.9	6,442.6	8,028.0	9,735.7	11,725.3	13,372.4	15,259.4	17,172.4
Public Administration & Defense c/	1,373.8	1,718.4	1,992.4	2,689.9	3,025.9	3,394.5	4,298.6	4,892.8	5,542.7	6,631.9
Other branches d/	3,111.3	3,784.3	4,222.6	5,336.9	6,585.8	7,731.7	9,138.2	10,565.1	12,115.7	13,747.8

a/ Includes fishing, hunting and forestry.
b/ Composed of commerce, banking, finance and insurance.
c/ Equals Government services.
d/ Composed of house rentals and personal services.

Source: Banco de la Republica

Table 3 COLOMBIA: GROSS DOMESTIC PRODUCT AT FACTOR COST BY SECTOR AT CURRENT PRICES, 1960-82
(millions of Colombian Pesos)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Preliminary estimate 1982	As Percent of Total 1970	As Percent of Total 1982
Gross Domestic Product at F.C.	119,796.9	140,531.8	172,231.8	226,384.5	307,797.1	386,371.6	494,272.1	662,613.6	841,155.7	1,082,638.9	1,425,078.4	1,796,575.4	2,241,600	100.0	100.0
Agriculture a/	34,244.8	38,828.1	49,221.3	66,644.2	88,171.6	113,340.0	148,040.5	211,950.5	255,682.0	310,571.7	392,954.0	483,339.6	591,782	28.6	26.4
Mining	2,528.0	2,968.9	2,953.6	3,438.0	4,124.8	4,980.5	5,985.5	7,576.8	11,179.2	14,846.4	27,974.9	32,215.1	44,832	2.1	2.0
Manufacturing	20,976.7	25,589.5	31,746.9	44,127.0	63,722.8	79,700.6	104,653.2	132,855.5	174,077.3	238,237.3	310,047.9	384,925.1	479,702	17.5	21.4
Construction	6,530.0	8,039.9	8,923.3	12,207.9	17,086.4	19,728.7	20,446.4	27,655.6	37,974.2	52,061.3	75,001.2	103,681.0	130,013	5.5	5.8
Electricity, Gas and Water	1,789.9	2,204.4	2,733.9	3,317.1	3,887.5	4,849.0	6,771.3	8,839.7	11,434.9	16,083.3	24,443.1	35,413.1	49,315	1.5	2.2
Transportation and Communication	8,881.1	10,336.3	11,666.9	13,883.1	20,551.9	23,987.4	32,472.8	45,072.8	57,471.3	79,759.4	108,423.9	133,269.6	170,362	7.4	7.6
Trade b/	20,760.2	23,513.6	29,683.8	39,218.0	55,786.2	69,619.7	88,156.4	117,509.6	149,940.9	181,805.0	233,202.2	293,299.4	363,139	17.3	16.2
Public Administration & Defense c/	8,283.5	10,225.3	12,714.3	16,454.9	20,849.4	26,758.0	32,457.8	40,102.9	54,061.4	74,461.8	100,558.8	131,226.5	163,637	6.9	7.3
Other branches d/	15,804.7	18,825.8	22,587.8	27,094.3	33,616.5	43,407.7	55,288.2	71,050.2	89,334.5	114,812.7	152,472.2	199,206.0	248,818	13.2	11.1

a/ Includes fishing, hunting and forestry.
b/ Composed of commerce, banking, finance and insurance.
c/ Equals Government services.
d/ Composed of house rentals and personal services.

Source: Banco de la Republica

Table 4 COLOMBIA: GROSS DOMESTIC PRODUCT AT FACTOR COST BY SECTOR AT CONSTANT PRICES, 1960-82
(millions of 1970 Colombian Pesos)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
Gross Domestic Product at F.C.	71,902.4	75,748.0	79,896.2	82,367.8	87,263.2	90,351.4	95,332.2	99,648.3	105,838.5	112,424.1
Agriculture a/	24,305.2	25,337.3	26,193.2	26,326.6	27,823.7	27,833.6	28,762.0	30,249.9	32,332.6	33,430.6
Mining	1,862.0	1,741.1	1,733.8	1,951.0	2,109.0	2,267.2	2,180.9	2,209.0	2,133.5	2,518.4
Manufacturing	11,698.1	12,397.5	13,249.8	13,878.7	14,699.2	15,388.5	16,411.2	17,000.1	18,051.1	19,367.8
Construction	3,114.6	3,537.5	3,786.1	3,439.8	3,444.7	3,526.3	4,148.6	5,010.1	5,521.7	6,048.1
Electricity, Gas and Water	767.2	781.5	949.6	1,024.7	1,066.4	1,163.7	1,234.4	1,398.5	1,495.9	1,625.0
Transportation and Communication	4,767.7	5,133.1	5,532.3	5,811.7	6,166.8	6,488.2	6,935.1	7,028.6	7,448.2	8,075.6
Trade b/	11,279.8	11,944.0	12,782.8	13,196.6	14,372.7	15,047.0	16,106.8	16,363.7	17,487.5	18,786.5
Public Administration & Defense c/	4,852.7	5,205.2	5,519.6	5,961.7	6,185.2	6,523.4	6,789.6	6,971.7	7,206.5	7,563.9
Other Branches d/	9,255.1	9,670.8	10,149.0	10,777.0	11,395.5	12,113.5	12,763.6	13,416.7	14,161.5	15,008.2

a/ Includes fishing, hunting and forestry.
b/ Composed of commerce, banking, finance and insurance.
c/ Equals Government services.
d/ Composed of house rentals and personal services.

Source: Banco de la Republica

Table 4 COLOMBIA: GROSS DOMESTIC PRODUCT AT FACTOR COST BY SECTOR AT CONSTANT PRICES, 1960-82
(millions of 1970 Colombian Pesos)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Preliminary estimate 1982
Gross Domestic Product at F.C.	119,796.9	126,721.8	136,743.5	147,178.0	156,707.5	163,399.2	170,226.5	178,325.7	194,817.6	203,664.3	211,929.9	217,228.2	220,296.8
Agriculture a/	34,244.8	34,887.6	37,784.8	39,157.4	41,516.9	44,066.4	44,905.0	46,096.5	50,575.0	52,617.5	53,953.8	55,680.3	55,234.9
Mining	2,528.0	2,550.8	2,379.9	2,591.7	2,403.8	2,240.7	2,145.9	2,063.8	2,154.4	2,131.2	2,438.2	2,523.5	2,712.8
Manufacturing	20,976.7	22,778.8	24,933.4	27,828.2	29,657.2	30,030.7	32,037.7	33,386.8	36,289.2	37,891.0	38,372.5	37,988.8	37,625.5
Construction	6,530.0	6,859.6	6,993.9	7,839.2	8,142.4	7,795.9	6,686.2	7,067.0	7,334.9	7,235.3	7,936.2	8,706.0	9,054.0
Electricity, Gas and Water	1,787.9	1,960.0	2,226.7	2,473.3	2,615.1	2,753.4	3,067.7	3,138.4	3,391.0	3,742.1	4,031.4	4,140.3	4,409.4
Transportation and Communication	8,881.1	9,537.9	10,377.2	11,367.5	12,946.5	14,085.3	15,076.1	16,232.7	18,041.6	19,333.2	20,524.2	20,996.0	22,381.7
Trade b/	20,760.2	22,430.9	24,220.6	26,227.4	28,231.8	29,487.8	31,698.2	33,724.4	37,795.1	38,799.7	40,335.6	40,835.8	40,590.8
Public Administration & Defense c/	8,283.5	8,859.3	9,757.0	10,529.7	10,775.1	11,189.1	11,370.6	11,786.3	12,678.0	13,567.2	14,515.9	14,979.5	15,690.4
Other Branches d/	15,804.7	16,856.9	18,070.0	19,163.6	20,418.7	21,749.9	23,239.1	24,829.8	26,558.4	28,347.1	29,822.1	31,378.0	32,597.3

a/ Includes fishing, hunting and forestry.
b/ Composed of commerce, banking, finance and insurance.
c/ Equals Government services.
d/ Composed of house rentals and personal services.

Source: Banco de la Republica

Table 5 COLOMBIA: GROSS DOMESTIC PRODUCT AT MARKET PRICES, AGRICULTURE AND TOTAL ('000)

	Current Pesos			1975 Pesos		
	Agriculture[a]/	Non-Coffee Agriculture	Total Economy	Agriculture	Non-Coffee Agriculture	Total Economy
1970	36,194	27,531	132,768	86,488	69,168	307,496
1971	39,595	31,822	155,886	88,059	70,886	325,825
1972	49,439	39,453	189,614	93,772	75,786	350,813
1973	65,203	51,340	243,160	96,022	77,686	374,398
1974	84,386	70,856	322,384	100,944	82,252	395,910
1975	108,490	88,194	405,108	108,490	88,194	405,108
1976	147,300	107,237	532,270	108,805	89,648	424,263
1977	211,216	142,513	716,029	109,904	91,142	441,906
1978	240,133	170,228	909,487	123,624	98,550	479,335
1979	285,523	213,262	1,188,817	132,306	102,660	505,119
1980	362,075	270,688	1,579,130	135,499	105,319	525,765
1981	407,649	331,421	1,982,773	136,285	113,609	537,736
1982	491,399	402,367	2,458,788	134,483	112,580	542,757

n.a. Not available.

a/ Consisting of Pergamino coffee (01), other agricultural production (02), animal production (03), coffee harrowing (08) and sugar manufacturing (12).

Source: DANE.

Table 6 COLOMBIA: EXPORTS (f.o.b.) AND IMPORTS (c.i.f.), 1970-1982
(in million of current pesos)

Year	Exports (f.o.b.)						Imports (c.i.f.)			
	Agriculture (01+02+03)	Processed Coffee (08)	Sugar (12)	Broad Agriculture (01+02+03+08+12)	Rest of the Economy	Total	Agriculture (01+02+03)	Sugar (12)	Rest of the Economy	Total
1970	2,095	8,749	1,472	12,316	5,303	17,619	769	10	18,545	19,324
1971	2,118	8,279	336	10,733	7,921	18,654	1,324	-	23,644	24,968
1972	2,781	10,646	672	14,099	11,034	25,133	1,223	-	23,044	24,267
1973	3,103	15,165	783	19,051	17,239	36,290	2,365	-	28,429	30,794
1974	4,694	16,703	1,927	23,324	23,551	46,875	3,560	-	46,830	50,390
1975	7,809	23,622	2,883	34,314	29,763	64,077	2,574	-	54,188	56,762
1976	8.650	42,329	993	51,972	38,760	90,732	3,639	-	70,320	73,959
1977	11,229	60,751	106	72,086	48,677	120,763	4,084	22	90,401	94,507
1978	13,132	79,060	1,049	93,241	57,970	151,211	4,618	317	120,561	125,496
1979	14,241	88,762	2,445	105,448	75,448	180,896	5,968	-	153,870	159,838
1980	19,918	116,793	9,273	145,984	110,119	256,103	13,370	1	232,926	246,297
1981	25,618	85,773	4,705	116,096	118,887	234,983	12,130	2	293,575	305,707
1982	26,577	109,330	3,799	139,706	134,204	273,910	18,379	1	359,674	378,054

Note: Exports and imports for the total economy comprise goods and services. These data differ slightly from the national account statistics of the Central Bank.

Source: DANE, Cuentas Nacionales de Colombia (Revision 3), 1970-1980, Matriz Insumo-Producto, and unpublished information.

Table 7 COLOMBIA: EXPORTS (f.o.b.) AND IMPORTS (c.i.f.), 1970-1982
(million of 1975 pesos)

Year	Exports (f.o.b.)						Imports (c.i.f.)			
	Agriculture (01+02+03)	Processed Coffee (08)	Sugar (12)	Broad Agriculture (01+02+03+08+12)	Rest of the Economy	Total	Agriculture (01+02+03)	Sugar (12)	Rest of the Economy	Total
1970	5,981	18,153	1,565	25,699	20,335	46,034	2,870	-	50,702	53,572
1971	5,162	18,651	1,685	25,498	22,639	48,137	4,318	-	60,045	64,363
1972	5,342	18,835	1,992	26,169	27,689	53,858	3,522	-	52,383	55,905
1973	4,554	19,253	1,779	25,586	32,341	57,927	4,087	-	53,889	57,976
1974	5,348	19,931	1,843	27,122	28,869	55,991	3,764	-	60,009	63,773
1975	7,809	23,622	2,883	34,314	29,763	64,077	2,574	-	54,188	56,762
1976	7,690	21,431	1,436	29,557	32,476	62,033	3,547	-	60,215	63,762
1977	8,114	15,921	291	24,326	34,916	59,242	3,177	70	66,732	69,979
1978	8,942	27,473	2,141	38,556	35,597	74,153	4,529	1,009	78,940	84,478
1979	7,283	33,991	3,041	44,315	36,032	80,347	3,871	-	81,268	85,139
1980	8,381	34,753	3,591	46,725	37,725	84,450	6,111	-	94,994	101,105
1981	8,714	29,018	2,196	39,928	34,529	74,457	4,990	1	101,064	106,055
1982	6,873	28,416	3,825	39,114	33,528	72,642	6,873	1	107,147	114,021

Note: Exports and imports for the total economy comprise goods and services.

Source: DANE, Cuentas Nacionales de Colombia (Revision 3), 1970-1980, Matriz Insumo-Producto, and unpublished information.

Table 8 COLOMBIA: COMMODITY EXPORTS, 1970-82 a/
(millions of US Dollars)

	1970	1971	19'2	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982e
Major Export:													
Green Coffee	467.0	400.0	430.0	598.0	622.0	672.0	967.2	1,497.9	1,979.0	2,005.0	2,361.0	1,423.3	1,561.5
Minor Exports:													
Agro-based Products	101.4	105.2	155.0	166.5	229.5	327.4	267.5	353.8	339.3	381.1	643.0	589.6	494.1
Cotton	34.6	29.7	51.2	38.1	48.6	76.1	59.4	164.0	72.5	52.0	159.3	148.4	66.5
Cattle & Beef	21.8	28.2	37.7	43.4	36.0	56.8	52.1	45.0	46.5	37.2	27.3	54.1	46.1
Sugar	14.0	15.7	28.4	30.2	68.6	95.1	24.1	2.2	19.5	49.6	165.0	76.9	54.7
Bananas	18.1	14.7	13.7	15.4	25.4	31.6	40.9	45.6	76.0	84.8	94.0	122.4	131.1
Tobacco	7.2	9.2	9.9	15.0	18.9	12.8	25.5	19.2	27.5	24.2	25.7	19.6	21.7
Flowers	1.0	1.8	3.1	8.4	16.0	19.3	21.6	32.6	53.4	79.2	99.4	108.6	111.5
Rice	0.0	0.0	0.7	3.4	0.5	22.9	21.4	19.9	4.6	8.8	16.6	9.5	-
Cheese	-	0.2	1.4	3.3	0.4	1.2	2.8	6.8	16.1	17.1	20.4	16.7	10.0
Fish	4.7	5.7	8.9	9.3	11.5	11.6	19.7	18.5	23.2	28.2	35.3	33.4	32.6
Manufactured Products:	83.3	118.4	168.5	256.4	479.3	392.5	429.4	449.3	615.0	665.8	747.7	751.1	900.8
Food Products b/	11.1	11.7	15.7	8.1	11.9	19.3	16.1	30.5	31.3	34.0	54.3	94.1	67.9
Footwear, Clothing & Textiles c/	18.7	26.7	42.6	81.9	154.0	102.4	139.0	88.0	194.7	150.4	180.0	176.2	183.9
Leather & Hides	6.7	7.0	19.0	25.5	16.0	16.5	20.4	30.0	33.8	37.7	32.0	39.7	47.4
Chemicals & Pharmaceuticals	7.6	11.4	16.9	32.2	70.7	53.0	44.5	45.9	12.2	60.7	84.5	78.2	76.5
Basic Metals & Products	4.9	6.9	10.9	20.9	28.0	21.5	23.6	32.7	36.4	65.9	47.8	62.4	68.0
Mechanical & Electrical Equipment	3.7	5.3	7.3	13.1	23.6	23.1	29.4	43.9	41.1	52.1	62.4	63.8	62.7
Timber & Wood Products	5.4	5.6	8.7	22.0	30.6	8.0	13.6	14.7	7.5	15.1	11.3	11.7	16.9
Paper, Cartons & Books	3.6	4.4	10.0	11.0	14.2	16.4	25.1	28.3	72.2	53.0	71.0	90.9	74.0
Cement	3.3	3.2	5.7	6.9	9.8	11.9	23.3	14.9	21.9	30.7	35.7	31.3	34.3
Glass	4.2	3.9	4.2	4.8	6.6	7.3	10.0	10.0	9.7	14.3	18.0	14.9	11.3
Plastics	1.3	2.3	3.5	4.7	5.9	7.6	9.8	10.7	14.4	17.3	25.8	25.4	26.9
Transport Equipment	0.7	9.5	2.3	2.8	5.4	7.1	9.2	15.6	21.1	17.9	25.7	30.2	16.2
Fuel Oil d/	12.1	20.5	21.7	22.5	102.6	98.3	65.4	84.1	118.7	116.7	99.2	32.3	212.8
Other Products:	83.9	66.4	112.5	156.4	86.1	33.3	62.5	121.8	63.9	218.9	193.3	192.4	138.6
Total Goods	735.6	690.0	866.0	1,177.3	1,416.9	1,465.2	1,745.2	2,443.2	3,002.7	3,300.4	3,945.0	2,956.4	3,095.0
Balance of Payments Adjustment	52.4	62.0	113.0	85.7	77.1	281.8	509.8	283.8	267.3	280.6	427.4	501.8	303.6
Total Goods Adjusted	788.0	752.0	979.0	1,263.0	1,494.0	1,747.0	2,255.0	2,727.0	3,270.0	3,581.0	4,372.4	3,458.2	3,398.6
Freight & Insurance	43.0	49.0	49.0	65.0	98.0	93.0	120.0	144.0	140.0	153.0	142.4	114.1	166.7
Other Transportation	52.0	58.0	55.0	69.0	80.0	82.0	142.0	146.0	165.0	182.0	290.0	366.3	303.5
Travel	54.0	61.0	59.0	72.0	105.0	141.0	175.0	231.0	260.0	357.0	402.4	375.6	420.0
Other	63.0	54.0	65.0	79.0	81.0	102.0	113.0	195.0	204.0	385.0	470.3	291.5	390.3
Total Goods and NFS	1,000.0	974.0	1,207.0	1,548.0	1,858.0	2,165.0	2,805.0	3,443.0	4,039.0	4,658.0	5,677.5	4,605.7	4,679.1

e Preliminary estimate.

a/ Based on Customs data.
b/ Excluding sugar.
c/ Excluding cotton fiber.
d/ ECOPETROL figures for 1976-81.

Source: DANE and Banco de la Republica

Table 9 COLOMBIA: BALANCE OF PAYMENTS, 1970-82
(millions of US Dollars)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982e
FOB Merchandise Exports	788	752	979	1,263	1,494	1,747	2,255	2,727	3,270	3,581	4,372	3,458	3,399
FOB Merchandise Imports	802	900	848	982	1,510	1,425	1,665	1,979	2,564	2,996	4,300	4,763	5,175
Trade Balance	-14	-148	131	281	-16	322	590	748	706	585	72	-1,305	-1,776
Non-Factor Service Receipts	212	222	228	285	364	418	550	716	769	1,077	1,304	1,148	1,281
Non-Factor Service Payments	347	385	388	442	562	605	656	783	861	943	1,194	1,315	1,269
Goods and Services Balance	-149	-311	-29	124	-214	135	484	681	614	719	182	-1,472	-1,764
Net Factor Income	-180	-176	-196	-215	-192	-263	-313	-272	-301	-255	-210	-428	-701
Receipts	(19)	(n.a.)	(n.a.)	(40)	(89)	(61)	(71)	(72)	(132)	(267)	(494)	(647)	(496)
Payments	(199)	(n.a.)	(n.a.)	(255)	(281)	(324)	(384)	(344)	(433)	(522)	(704)	(1,075)	(1,197)
Net Private Transfers	-10	3	11	11	22	30	39	40	44	98	164	242	223
Current Account Balance	-339	-484	-214	-80	-384	-98	210	449	357	562	136	-1,658	-2,242
Official Grant Aid	37	31	24	24	33	18	12	6	29	3	-	-	24
Private Capital	56	59	24	8	27	24	-25	37	35	208	109	630	597
Direct Investment	39	40	17	23	36	32	14	43	67	704	52	228	268
Loans (net)	17	19	7	-15	-9	-8	-39	-6	-32	104	57	402	329
Disbursements	(84)	(109)	(104)	(81)	(88)	(58)	(44)	(55)	(65)	(152)	(70)	(690)	(428)
Amortization	(67)	(90)	(97)	(96)	(97)	(66)	(83)	(61)	(97)	(48)	(13)	(288)	(99)
Public and Publicly Guaranteed Capital	173	145	261	310	216	269	141	202	79	505	635	1,031	871
Disbursements	(248)	(237)	(357)	(441)	(424)	(411)	(295)	(382)	(325)	(950)	(1,055)	(1,321)	(1,245)
Amortization	(75)	(92)	(96)	(131)	(208)	(142)	(154)	(180)	(246)	(445)	(420)	(290)	(374)
SDR Allocation	21	17	18	-	-	-	-	-	-	24	24	24	-
Short-Term Capital	58	67	-34	-63	-241	-111	7	-67	-21	-178	-67	181	170
Net Reserve Change (- = Increase)	2	75	-192	-225	364	-139	-562	-852	-610	-1,237	-1,094	-140	773
Central Bank	-55	-19	-178	-180	93	-117	-619	-667	-652	-1,624	-1,235	-242	706
Rest of Banking System	57	94	-14	-45	269	-22	57	-185	42	387	747	102	67
Errors and Omissions	-8	90	113	26	-15	37	217	225	131	113	257	-68	-193

e Preliminary estimate.

Source: Banco de la Republica.

Table 10 COLOMBIA: IMPORTS BY ECONOMIC CATEGORY, 1970-82 a/
(millions of US Dollars)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
CONSUMER GOODS	91.9	101.1	105.4	161.6	190.3	168.5	204.5	287.6	503.5	451.1	619.6	667.6	690.6
Durables	43.9	45.1	48.4	57.5	87.9	78.5	93.7	130.3	187.4	196.8	312.2	336.2	366.7
Non-Durables	43.0	56.0	57.0	104.1	102.4	90.0	110.8	157.3	316.1	254.3	307.4	331.4	323.9
RAW MATERIALS AND INTERMEDIATE GOODS	366.1	410.7	405.7	490.1	936.4	780.8	843.0	1,076.5	1,434.8	1,705.3	2,458.8	2,701.1	2,771.2
Fuels	1.2	8.1	5.4	2.1	3.0	14.5	39.9	136.2	204.5	322.2	562.8	724.1	656.7
Agricultural Inputs	8.3	10.1	21.2	34.8	99.4	54.8	22.9	69.7	104.5	95.8	162.2	147.0	189.7
Industrial Inputs	356.6	392.5	379.1	453.2	834.0	711.5	780.2	870.6	1,125.8	1,287.3	1,734.0	1,830.0	1,924.8
CAPITAL GOODS	368.2	397.6	330.8	386.7	464.9	539.3	660.6	664.2	898.0	1,076.8	1,584.2	1,830.5	2,015.9
Construction Equipment	20.3	15.8	10.1	18.9	32.4	35.4	42.6	26.1	44.7	63.1	98.3	159.6	213.6
Agricultural Equipment	13.0	8.1	10.6	18.3	24.3	29.0	30.7	44.1	54.2	39.3	63.1	66.1	68.3
Industrial Equipment	194.7	246.3	216.7	225.1	260.5	269.1	330.5	387.8	517.0	603.1	955.0	1,113.2	1,148.9
Transport Equipment	140.2	127.4	93.4	124.4	147.7	205.8	156.7	206.2	282.1	371.2	467.8	491.6	585.1
UNCLASSIFIED	17.8	20.0	17.1	23.1	5.6	6.2	-	-	-	-	-	-	-
TOTAL GOODS	844.0	929.4	859.0	1,061.5	1,597.2	1,494.8	1,708.1	2,028.3	2,836.3	3,233.2	4,662.6	5,199.2	5,477.7

a/ Based on Customs data.

Notes: Subcategories were calculated on the basis of import registrations as shares of totals for the years 1970 to 1973.
Figures for total merchandise imports have been adjusted in the Balance of Payments by Banco de la Republica.

Source: DANE

Table 11 COLOMBIA: IMPORTS BY PRINCIPAL PRODUCT GROUPS, 1970-82 a/
(millions of US Dollars)

	Machinery & Electrical Equipment	Vehicles & Transportation Equipment	Fuels, Mineral Oils & Products	Chemicals & Pharmaceuticals	Iron & Steel	Plastics	Paper Materials & Products	Rubber Products	Foodstuffs	Other	Total
1970	231.2	136.8	8.7	76.6	78.6	22.5	35.9	14.0	31.0	200.9	836.2
1971	275.5	127.7	10.8	87.6	81.6	25.4	35.1	16.9	62.7	206.1	929.4
1972	256.0	117.3	5.4	92.4	64.6	21.0	37.8	17.0	46.7	200.8	859.0
1973	359.3	128.0	3.9	127.0	72.2	21.8	48.4	21.3	80.1	199.5	1,061.5
1974	306.7	191.6	3.7	210.8	139.6	45.1	67.9	35.1	143.5	453.2	1,597.2
1975	329.7	238.4	18.4	199.1	135.3	41.1	68.3	28.7	94.8	341.0	1,494.8
1976	406.4	251.4	41.7	200.6	122.9	48.8	66.6	40.5	146.2	383.0	1,708.1
1977	475.5	273.7	136.3	236.8	123.6	61.0	72.2	45.3	156.6	447.3	2,028.3
1978	618.4	380.7	205.1	300.6	180.9	84.0	96.3	55.3	180.6	734.4	2,836.3
1979	719.4	455.4	324.3	291.4	251.6	101.2	103.4	69.4	213.6	703.5	3,233.2
1980	1,099.1	626.0	566.5	409.9	316.1	145.3	169.8	85.8	232.6	1,011.5	4,662.6
1981	1,244.9	661.4	729.1	436.3	382.5	135.6	199.7	95.8	294.9	1,019.0	5,199.2
1982	1,310.0	776.9	661.4	457.2	442.5	139.6	213.1	98.2	297.0	1,081.8	5,477.7

a/ Based on Customs data.

Source: DANE

Table 12 WEIGHTED AVERAGE NOMINAL TARIFFS, 1979-1983

(Percent)

	Section	Chapters	1979	1981	1983
1.	Live Animals & Related Products	1-5	25.25	22.75	27.25
2.	Vegetables & Related Goods	6-14	15.93	14.09	16.75
3.	Greases, Oils, Vegetable Oils	15	20.32	18.17	21.03
4.	Foods, Beverages, Alcoholic Beverages, Tobacco	16-24	35.77	32.31	38.45
5.	Mineral Products	25-27	12.29	11.21	13.28
6.	Chemical Products	28-38	17.91	16.41	19.62
7.	Plastics, Cellulose & Rubber Products	39-40	35.78	27.41	32.26
8.	Leathers, Furs, Luggage & Others	41-43	21.75	22.63	25.49
9.	Timber, Cork, Vegetable Coal	44-46	38.95	35.41	42.89
10.	Paper & Related Products	47-49	30.55	25.37	28.38
11.	Textiles	50-63	51.55	52.24	63.31
12.	Shoes, Hats, Artifical Flowers	64-67	53.09	53.15	63.78
13.	Manufacturers of Stoves, Cement, Pottery, Glass	68-70	38.53	29.69	35.16
14.	Pearls, Precious Stones, Coins	71-72	33.71	34.71	41.66
15.	Common Metals	73-83	28.49	25.24	30.05
16.	Machinery, Electircal Material	84-85	26.51	22.83	26.80
17.	Transportation Material	86-89	45.96	38.50	45.99
18.	Optimal Material, Medical	90-92	22.69	21.98	23.60
19.	Material, Music, Television Weapons	93	49.13	49.80	59.70
20.	Other Products	94-98	44.92	38.73	45.72
21.	Art Objects, Antiques	99	0.00	0.00	0.00

Source: Constructed from data obtained from Giraldo (1979), DNP and Arancel de Aduanas Legis.

Table 13 NOMINAL TARIFFS, 1979-1983

(Percent)

Chapter		1979 (1st Quarter)			1981 (2nd Quarter)			1983		
		$\bar{x}$	σ	max	$\bar{x}$	σ	max	$\bar{x}$	σ	max
1	Live Animals	17.30	10.04	50.00	15.27	6.57	35.00	18.16	8.00	42.00
2	Meats, etc.	27.50	5.20	35.00	24.23	6.89	35.00	29.08	8.43	42.00
3	Fish, etc.	24.12	1.91	25.00	20.23	3.53	25.00	24.27	4.33	30.00
4	Milk, Milk Products, Eggs, Honey	26.86	12.04	45.00	24.33	11.69	45.00	29.16	14.33	54.00
5	Products of Animal Origin	18.14	5.48	20.00	14.65	5.01	20.00	17.54	6.26	24.00
6	Live Plants	12.50	4.33	15.00	11.00	4.90	15.00	13.20	6.57	18.00
7	Vegetables, Plants, Roots	17.38	5.26	25.00	16.30	3.96	25.00	19.17	5.10	30.00
8	Fruits	20.53	1.53	25.00	20.28	1.78	25.00	24.33	2.15	18.00
9	Coffee, Tea, Spices	20.74	2.95	35.00	17.22	4.37	35.00	20.77	5.43	42.00
10	Cereals	15.10	6.93	25.00	12.96	5.34	25.00	15.41	7.74	30.00
11		26.38	3.45	35.00	21.61	5.83	35.00	25.92	7.13	42.00
12	Oil, Seeds, Industrial Plants	14.12	3.31	25.00	12.88	4.01	20.00	15.28	4.95	18.00
13	Rubber	16.58	4.60	35.00	17.14	5.25	35.00	20.57	6.34	42.00
14	Other Products of Vegetable Origin	15.00	0.00	15.00	15.00	0.00	15.00	18.00	0.00	18.00
15	Oils and Fats	20.32	7.06	35.00	88.17	5.20	35.00	21.03	7.02	42.00
16	Meat, Fish & Shellfish, Prepared Foods	48.50	10.50	55.00	44.29	9.42	55.00	52.75	11.24	66.00
17	Sugar	26.94	14.92	55.00	25.00	14.81	55.00	30.00	18.29	66.00
18	Cocoa & Derivatives	29.29	14.00	55.00	27.86	13.59	55.00	31.14	17.61	66.00
19	Prepared Foods based on Cereals & Wheats	40.45	4.98	45.00	37.00	6.00	45.00	44.40	7.59	54.00
20	Foods based on Vegetables and Fruits	54.22	2.91	55.00	48.31	6.35	55.00	57.30	10.26	66.00
21	Other Food	32.31	8.23	55.00	31.21	8.68	55.00	37.45	10.60	66.00
22		59.46	11.26	75.00	52.42	11.94	75.00	62.73	14.70	90.00
23		10.29	1.18	15.00	10.10	1.18	15.00	11.75	1.80	12.00
24		24.10	9.71	30.00	21.00	10.84	30.00	25.17	13.65	36.00

Table 13 Nominal Tariffs 1979 - 1983
(Percent)

Chapter		1979 $\bar{x}$	1979 σ	1979 max	1981 $\bar{x}$	1981 σ	1981 max	1983 $\bar{x}$	1983 σ	1983 max
25	Salt, Sulfur, Stones, Cement	10.71	2.58	25.00	11.02	2.96	25.00	13.31	3.46	30.00
26	Metallurgic metals, Ashes	10.00	0.00	10.00	8.33	2.36	10.00	10.00	2.89	12.00
27	Mineral Fuels, Oils, & Waxes	12.44	6.31	35.00	11.26	5.33	20.00	13.31	6.61	24.00
28	Inorganic Chemical Materials, Precious Metals	24.73	2.21	25.00	20.06	2.82	25.00	23.90	3.62	30.00
29	Organic Chemical Products	15.70	7.27	45.00	15.52	7.25	45.00	18.53	8.43	42.00
30	Pharmaceutical Products	16.51	12.99	45.00	13.14	10.96	45.00	15.10	13.11	54.00
31	Fertilizers	3.00	3.65	15.00	2.93	3.24	15.00	3.21	3.95	18.00
32	Paints & Other Dying Products	26.39	3.39	45.00	25.28	4.24	45.00	30.55	5.20	54.00
33	Perfumes & Cosmetics	43.19	8.47	65.00	33.68	8.71	65.00	40.42	10.74	78.00
34	Soaps & Others	36.33	10.40	55.00	32.67	10.62	55.00	38.73	13.22	66.00
35	Albuminoids	25.63	1.65	30.00	20.79	9.36	30.00	24.92	11.55	36.00
36	Powder, Explosives and Others	30.63	1.65	35.00	27.35	3.48	35.00	32.82	4.30	40.00
37	Photographic Materials	14.10	12.04	40.00	10.57	9.16	30.00	16.50	9.40	24.00
38	Other Chemical Products	21.59	6.09	45.00	20.26	6.02	45.00	23.92	7.65	54.00
39	Plastics & Others	37.96	20.62	75.00	30.57	13.97	75.00	35.90	18.02	90.00
40	Natural Rubber Products	32.08	19.36	65.00	22.02	14.01	65.00	26.06	17.15	78.00

Table 13 Nominal Tariffs 1979 - 1983
(Percent)

Chapter		1979 $\bar{x}$	1979 σ	1979 max	1981 $\bar{x}$	1981 σ	1981 max	1983 $\bar{x}$	1983 σ	1983 max
41	Leathers & Furs	15.88	8.06	30.00	16.28	8.00	30.00	19.52	9.83	36.00
42	Leather Manufactures	41.39	15.07	65.00	43.89	15.54	65.00	45.47	23.87	78.00
43	Furs	61.43	21.00	85.00.	45.83	17.89	70.00	55.00	23.52	84.00
44	Timber, Vegetable Coal, Timber Manufacture	39.72	17.74	65.00	36.17	15.63	65.00	43.78	19.47	78.00
45	Corks	20.54	6.56	25.00	17.92	3.80	20.00	21.50	4.76	24.00
46	Baskets	46.25	5.45	55.00	43.75	6.50	55.00	52.50	9.00	66.00.
47	Materials used in the manufacturing of Paper	15.00	0.00	15.00	15.00	0.00	15.00	18.00	0.00	18.00
48	Paper, Cardboard, Cellulose	31.50	7.98	55.00	29.06	6.97	45.00	32.38	11.87	54.00
49	Stationery & Books	39.68	20.18	55.00	25.27	18.47	45.00	27.70	22.83	54.00
50	Silk Products	47.27	20.04	75.00	35.00	16.01	60.00	42.00	20.54	72.00
51	Artificial Textiles	39.75	9.15	55.00	37.31	13.24	55.00	44.52	16.71	66.00
52	Metallic Textiles	68.33	4.71	75.00	68.33	4.71	75.00	82.00	6.43	90.00
53	Wool & Related Products	43.67	22.52	75.00	49.87	24.43	75.00	66.11	24.75	90.00
54	Linen	44.50	22.96	75.00	42.73	22.60	75.00	51.27	28.44	90.00
55	Cotton	47.50	23.25	75.00	48.50	21.10	75.00	58.20	25.98	90.00
56	Artificial, Discontinuous Textiles	36.43	9.02	55.00	37.85	9.86	55.00	45.69	11.37	66.00
57	Other Textiles	37.50	17.95	65.00	24.32	15.76	65.00	41.18	14.36	78.00
58	Carpets & Other Related Goods	81.43	9.34	95.00	84.29	9.97	95.00	95.90	17.27	114.00
59	Special Textiles	53.04	18.84	75.00	51.00	18.87	75.00	60.92	25.21	90.00

Table 13 Nominal Tariffs 1979 - 1983
(Percent)

Chapter		1979 $\bar{x}$	1979 σ	1979 max	1981 $\bar{x}$	1981 σ	1981 max	1983 $\bar{x}$	1983 σ	1983 max
60		78.27	17.15	95.00	77.59	17.18	95.00	93.11	21.01	114.00
61	Clothes	92.20	4.49	95.00	92.78	4.16	95.00	111.33	5.08	114.00
62	Other Clothes	78.10	9.82	85.00	80.42	8.16	85.00	96.50	10.48	102.00
63		70.00	15.00	85.00	70.00	15.00	85.00	84.00	25.46	102.00
64	Shoes, Boots & Components	55.00	17.85	85.00	57.69	18.15	85.00	69.23	22.66	102.00
65	Hats	51.36	9.79	65.00	47.00	6.00	55.00	56.40	7.59	66.00
66	Umbrellas, Canes & Components	47.00	7.48	55.00	42.50	4.33	45.00	51.00	6.00	54.00
67	Feathers & Related Goods	47.00	9.80	55.00	42.50	8.29	55.00	51.00	11.49	66.00
68	Manufactures of Stone & Other	31.67	4.71	45.00	27.63	4.83	40.00	33.08	5.94	48.00
69	Pottery & Ceramic Goods	39.52	16.97	85.00	34.17	17.83	70.00	40.50	21.10	84.00
70	Glass Products	39.93	12.84	65.00	26.39	8.45	40.00	31.10	10.90	48.00
71	Pearls, Precious Stones	33.71	18.26	75.00	34.71	20.80	75.00	41.66	25.32	90.00
72	Coins	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
73	Iron, Steel Products	25.77	12.22	85.00	22.99	10.34	85.00	27.31	12.20	48.00
74	Copper	29.38	12.15	40.00	26.06	11.18	40.00	31.10	31.42	48.00
75	Nickel	25.00	10.95	40.00	17.92	9.23	30.00	20.18	11.15	36.00
76	Aluminum	35.34	12.91	55.00	32.43	11.91	55.00	37.80	15.25	54.00
77	Magnesium	21.11	11.00	40.00	16.87	7.88	30.00	20.25	10.11	36.00
78	Lead	23.08	10.48	40.00	20.67	9.10	35.00	24.80	11.31	42.00
79	Zinc	26.25	12.77	45.00	22.50	11.46	45.00	27.00	14.48	54.00

Table 13 Nominal Tariffs 1979 - 1983
(Percent)

Chapter		1979 $\bar{x}$	1979 σ	1979 max	1981 $\bar{x}$	1981 σ	1981 max	1983 $\bar{x}$	1983 σ	1983 max
80		30.63	15.30	55.00	31.33	15.54	55.00	37.60	14.31	54.00
81	Other Common Metals	15.45	4.98	20.00	13.64	3.75	20.00	16.36	4.60	24.00
82	Tools, Silverwear	40.37	1.52	50.00	36.30	3.75	45.00	41.32	4.17	54.00
83	Other Common Metal Goods	48.53	9.67	65.00	41.03	8.02	65.00	49.31	9.61	78.00
84	Machines, Mechanical	23.20	18.83	105.00	20.43	17.69	105.00	23.81	20.34	78.00
85	Electric Machinery	34.69	17.09	75.00	28.78	15.94	75.00	34.11	18.71	78.00
86	Railroad Vehicles & Materials	32.95	13.03	45.00	29.75	11.45	40.00	36.00	14.42	48.00
87	Cars, Tractors & Other Vehicles	47.41	46.75	200.00	39.63	41.20	150.00	47.35	50.53	180.00
88	Air Navigation	17.91	15.66	55.00	16.69	12.72	45.00	19.46	15.23	54.00
89	Sea, Fluvial, & Ocean Navigation	20.17	20.58	55.00	18.86	16.35	55.00	22.47	20.32	66.00
90	Optical & Photographic Goods	21.11	10.38	65.00	20.63	9.62	75.00	21.60	12.85	66.00
91	Watches, Clocks	36.97	20.01	75.00	31.82	13.53	75.00	36.48	14.89	90.00
92	Musical & Television Products	28.40	8.57	50.00	27.55	8.57	40.00	32.44	17.22	48.00
93	Weapons	49.13	26.22	80.00	49.80	23.78	80.00	59.70	29.40	96.00
94	Furniture & Similar	50.00	8.66	17.32	44.23	10.35	55.00	52.91	14.51	66.00
95		31.67	4.71	45.00	33.57	7.42	45.00	40.28	9.62	54.00
96	Brushes & Similar	35.45	7.22	45.00	34.17	9.32	45.00	41.00	11.68	54.00
97	Toys & Sporting Goods	43.28	14.78	65.00	36.82	14.91	65.00	41.91	16.62	66.00
98	Various Manufactures	44.05	6.48	55.00	36.92	5.62	55.00	44.62	7.51	66.00

Table 13 Nominal Tariffs 1979 - 1983
(Percent)

Chapter		1979 $\bar{x}$	1979 σ	1979 max	1981 $\bar{x}$	1981 σ	1981 max	1983 $\bar{x}$	1983 σ	1983 max
99 00	Art Objects, Antiques	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Sources: For 1979 the data was obtained from Giraldo (1979); for 1981 the data was obtained from DNP. For 1983 it was computed by the author from the Arancel de Aduanas Legis.

Table 14 IMPORTS BY REGIME, 1979-1980-1983

(By Chapter)

Chapter	1979 FREE LIST		1979 PRIOR LICENSE		1980 FREE LIST		1980 PRIOR LICENSE		1983 FREE LIST		1983 PRIOR LICENSE	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	35	94.6	2	5.4	37	100.0	--	0.0	10	27.0	27	73.0
2	14	58.3	10	41.7	14	58.3	10	41.7	--	0.0	26	100.0
3	17	100.0	--	0.0	17	100.0	--	0.0	--	0.0	22	100.0
4	1	3.6	27	96.4	9	32.1	19	67.9	1	4.0	26	96.0
5	29	100.0	--	0.0	29	100.0	--	0.0	3	12.0	23	88.0
6	2	50.0	2	50.0	3	75.0	--	25.0	5	20.0	4	80.0
7	18	85.7	3	14.0	20	95.2	1	4.8	3	13.0	20	87.0
8	28	49.1	29	50.9	36	63.2	21	36.8	1	2.0	40	98.0
9	16	59.3	11	40.7	22	81.5	5	18.5	--	0.0	26	100.0
10	--	0.0	21	100.0	--	0.0	21	100.0	2	7.0	25	93.0
11	--	0.0	29	100.0	--	0.0	29	100.0	--	0.0	27	100.0
12	16	47.1	18	52.9	21	61.8	13	38.2	39	36.0	25	64.0
13	14	73.7	5	26.3	14	73.7	5	26.3	14	43.0	8	57.0
14	5	38.5	8	61.5	5	38.5	8	61.5	3	18.0	14	82.0
15	25	28.7	62.0	71.3	31	35.6	56	64.4	10	11.0	78	89.0
16	30	100.0	--	0.0	30	100.0	0	0.0	--	0.0	27	100.0
17	18	100.0	--	0.0	18	100.0	--	0.0	--	0.0	18	100.0
18	7	100.0	--	0.0	7	100.0	--	0.0	--	0.0	7	100.0
19	11	100.0	--	0.0	11	100.0	--	0.0	--	0.0	10	100.0
20	58	100.0	--	0.0	58	100.0	--	0.0	--	0.0	63	100.0
21	1	3.8	25	96.2	20	76.9	6	23.1	--	0.0	29	100.0
22	13	35.1	24	64.9	34	91.9	3	8.1	4	11.0	33	89.0
24	5	24.9	12	70.6	15	88.2	2	11.8	3	15.0	17	85.0
25	--	0.0	10	100.0	3	30.0	7	70.0	3	25.0	9	75.0
26	21	25.0	63	75.0	70	83.3	14	16.7	26	41.0	37	59.0
27	16	69.6	7	30.4	23	100.0	--	0.0	24	100.0	--	0.0
28	16	28.1	46	71.9	28	43.8	36	56.2	34	49.0	36	51.0
29	218	74.7	74	25.3	230	78.8	62	21.2	201	76.0	62	24.0
30	486	71.4	195	28.6	579	85.0	102	15.0	649	93.0	50	7.0
31	11	25.6	32	74.4	24	55.8	19	44.2	23	48.0	25	52.0
32	--	0.0	28	100.0	11	39.3	17	60.7	19	61.0	12	39.0
33	23	42.6	31	57.4	44	81.5	10	18.5	33	69.0	15	31.0
34	14	66.7	7	33.3	21	100.0	--	0.0	16	80.0	4	20.0
35	--	0.0	15	100.0	15	100.0	--	0.0	7	47.0	8	53.0
36	5	31.3	11	68.7	13	81.3	3	18.7	18	78.0	5	22.0
37	9	56.3	7	43.7	9	56.3	7	43.7	10	66.0	8	44.0

Table 14 IMPORTS BY REGIME: 1979-1980-1983

(By Chapter)

Chapter	1979				1980				1983			
	FREE LIST		PRIOR LICENSE		FREE LIST		PRIOR LICENSE		FREE LIST		PRIOR LICENSE	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
38	17	42.5	23	57.5	38	95.0	2	5.0	28	82.0	6	18.0
39	51	53.7	44	46.3	78	82.1	17	17.9	80	84.0	5	16.0
40	47	58.0	34	42.0	55	67.9	26	32.1	41	45.0	50	55.0
41	30	50.8	29	49.2	43	72.9	16	27.1	39	64.0	22	36.0
42	9	36.0	16	64.0	23	92.0	2	8.0	20	77.0	6	23.0
43	3	16.7	15	83.3	8	44.4	10	55.6	3	11.0	25	89.0
44	7	57.1	3	42.9	7	100.0	--	0.0	4	67.0	2	33.0
45	--	0.0	53	100.0	13	24.5	40	75.5	23	38.0	37	62.0
46	4	36.4	7	63.6	8	72.7	3	27.3	11	92.0	1	8.0
47	--	0.0	4	100.0	4	100.0	--	0.0	2	50.0	2	50.0
48	8	40.0	12	60.0	8	40.0	12	60.0	10	50.0	10	50.0
49	34	33.7	67	66.3	52	51.5	49	48.5	31	32.0	65	68.0
50	20	76.9	6	23.1	26	100.0	--	0.0	13	54.0	11	46.0
51	8	72.7	3	27.3	11	100.0	--	0.0	7	87.0	1	13.0
52	7	35.0	13	65.0	7	35.0	13	65.0	4	14.0	24	86.0
53	3	100.0	--	0.0	3	100.0	--	0.0	3	100.0	--	0.0
54	20	74.1	7	25.9	20	74.1	7	25.9	35	76.0	11	24.0
55	6	60.0	4	40.0	6	60.0	4	40.0	9	82.0	2	18.0
56	12	75.0	4	25.0	12	75.0	4	25.0	1	5.0	19	95.0
57	7	16.7	35	83.3	7	16.7	35	83.3	--	0.0	79	100.0
58	2	9.1	20	90.4	2	9.1	20	90.4	--	0.0	22	100.0
59	28	100.0	0	0.0	28	100.0	--	0.0	11	38.0	18	62.0
60	18	39.1	28	60.9	18	39.1	28	60.9	14	27.0	38	73.0
61	22	84.6	4	15.4	22	84.6	4	15.4	1	4.0	26	96.0
62	25	100.0	--	0.0	25	100.0	--	0.0	--	0.0	27	100.0
63	14	66.7	7	33.3	14	66.7	7	33.3	5	14.0	31	86.0
64	--	0.0	2	100.0	--	0.0	2	100.0	--	0.0	2	100.0
65	2	25.0	6	75.0	6	75.0	2	25.0	1	8.0	12	92.0
66	5	45.5	6	54.0	10	90.4	1	9.1	--	0.0	10	100.0
67	2	40.0	3	60.0	5	100.0	--	0.0	2	50.0	2	50.0
68	2	40.0	3	60.0	5	100.0	--	0.0	--	0.0	4	100.0
69	3	8.3	33	91.7	19	52.8	17	47.2	16	42.0	22	58.0
70	18	85.7	3	14.3	18	85.7	3	14.3	10	42.0	14	58.0
71	58	80.6	14	19.4	68	94.4	4	5.6	37	52.0	34	48.0
72	9	25.7	26	74.3	35	100.0	--	0.0	25	76.0	8	24.0
73	--	0.0	1	100.0	1	100.0	--	0.0	1	100.0	--	0.0

Table 14 IMPORTS BY REGIME: 1979-1980-1983

(By Chapter)

Chapter	1979 FREE LIST		1979 PRIOR LICENSE		1980 FREE LIST		1980 PRIOR LICENSE		1983 FREE LIST		1983 PRIOR LICENSE	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
74	111	44.9	136	55.1	112	45.3	135	54.7	54	29.0	132	71.0
75	18	45.0	22	55.0	24	60.0	16	40.0	35	70.0	15	30.0
76	13	86.7	2	13.3	15	100.0	--	0.0	10	91.0	1	9.0
77	20	54.1	17	45.9	27	73.0	10	27.0	11	26.0	31	74.0
78	8	88.9	1	11.1	9	100.0	--	0.0	8	100.0	--	0.0
79	13	100.0	--	0.0	13	100.0	--	0.0	13	100.0	--	0.0
80	6	50.0	6	50.0	9	75.0	3	25.0	8	80.0	2	20.0
81	13	81.3	3	18.7	14	87.5	2	12.5	11	73.0	4	27.0
82	20	90.0	2	9.1	20	90.9	2	9.1	22	100.0	--	0.0
83	45	54.9	37	45.1	46	56.1	36	43.9	28	35.0	53	65.0
84	19	55.9	15	44.1	21	61.8	13	38.2	9	13.0	30	77.0
85	250	50.7	243	49.3	267	54.2	226	45.8	353	63.0	209	37.0
86	112	47.9	122	52.1	113	48.3	121	51.7	85	44.0	166	66.0
87	11	50.0	11	50.0	11	50.0	11	50.0	12	60.0	8	40.0
88	16	17.6	75	82.4	20	22.0	71	78.0	15	15.0	85	85.0
89	9	81.8	2	18.2	9	81.8	2	18.2	5	38.0	8	62.0
90	1	8.3	11	91.7	1	8.3	11	91.7	0	0.0	18	100.0
91	126	80.3	31	19.7	130	82.8	27	17.2	134	76.0	42	24.0
92	27	93.1	2	6.9	28	96.6	1	3.4	17	52.0	16	48.0
93	29	58.6	21	42.0	35	70.0	15	30.0	15	26.0	42	74.0
94	--	0.0	16	100.0	--	0.0	16	100.0	--	0.0	20	100.0
95	--	0.0	8	100.0	4	50.0	4	50.0	--	0.0	13	100.0
96	1	11.1	8	88.9	1	11.1	8	88.9	--	0.0	7	100.0
97	--	0.0	11	100.0	4	36.4	7	63.6	1	8.0	11	92.0
98	5	17.2	24	82.8	11	37.9	18	62.1	1	3.0	33	97.0
99	5	11.9	37	88.1	16	38.1	26	61.9	4	10.0	35	90.0
100	--	0.0	6	100.0	--	0.0	6	100.0	--	0.0	6	100.0

Source: Giraldo (1979), Resolution 015/82

Table 15 WEIGHTS USED TO CONSTRUCT WEIGHTED AVERAGE IMPORT TARIFFS AND LICENSES

Section	Weight
1	.00959
2	.06046
3	.02276
4	.02619
5	.12051
6	.12684
7	.04964
8	.00062
9	.00188
10	.03634
11	.02440
12	.00038
13	.00753
14	.00020
15	.09250
16	.21533
17	.17540
18	.02013
19	.00911
20	.00435
21	.00003
TOTAL	1.00000

Source: DANE, "Anuario de Comercio Exterior".

Table 16 COLOMBIA: SUPPORT PRICES FOR AGRICULTURAL COMMODITIES BY IDEMA: 1970-1981
(in current pesos per ton)

Year	Corn	Paddy Rice	Beans	Sorghum	Soybean	Wheat	Barley	Sesame
1970	1,350	2,250	5,400	1,170	2,000	2,100	2,000	3,700
1971	1,600	2,250	5,400	1,200	2,600	2,100	2,150	4,000
1972	1,760	2,250	6,210	1,260	2,600	2,613	2,150	4,700
1973	2,184	2,408	8,493	1,864	2,871	3,069	2,455	5,085
1974	3,225	4,227	11,159	2,623	5,982	4,733	3,751	7,571
1975	3,897	4,613	15,500	3,600	7,000	5,972	5,000	11,700
1976	4,054	4,650	19,785	3,700	n.a.	6,932	6,000	n.a.
1977	5,836	5,332	22,778	4,529	9,240	7,562	n.a.	n.a.
1978	6,914	7,013	25,814	5,700	12,020	7,923	8,500	20,100
1979	7,587	8,436	28,414	6,322	13,045	9,602	8,894	23,339
1980	10,370	11,851	33,750	9,223	15,465	13,000	10,150	29,820
1981	15,250	14,300	42,750	12,350	22,600	16,500	14,000	30,410
1982	18,000	17,850	49,000	15,850	28,950	19,800	17,700	33,500
1983	21,840	21,650	61,625	18,570	34,280	23,625	21,300	40,110

Note: These prices are a weighted average from 1973-79, the weights being the share in total production. For 1980-1982 and 1970-72, the prices are arithmetic averages of the semesterly support prices. For rice the support prices taken as reference are IR-22 and Blue Bonnet.

n.a. not available

Source: E. Sarmiento, Objetivos del IDEMA, mimeo, for 1970-79; information from IDEMA for 1980-1983.

Table 17 COLOMBIA: INDEX OF REAL SUPPORT PRICES ESTABLISHED BY IDEMA: 1970-1982
(1975 = 100)

Year	Sesame	Paddy Rice	Barley	Beans	Corn	Sorghum	Soybean	Wheat
1970	81.3	138.9	102.8	89.5	89.1	83.6	73.4	90.4
1971	79.1	125.0	99.5	80.6	95.0	77.1	85.9	81.4
1972	79.2	106.5	84.8	79.0	89.1	69.0	73.2	86.3
1973	65.3	86.9	73.8	82.4	84.2	77.9	61.6	77.3
1974	78.4	123.1	91.0	87.3	100.3	88.4	103.6	96.1
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	n.a.	86.9	93.4	99.3	80.9	80.0	86.7	90.3
1977	n.a.	71.4	74.2	81.9	77.0	70.1	73.5	90.3
1978	88.0	86.2	87.1	85.3	91.0	81.1	87.9	68.0
1979	87.7	89.1	78.3	80.6	85.6	77.4	81.9	70.7
1980	91.1	103.0	73.7	75.7	98.5	90.6	80.2	81.2
1981	76.9	104.1	86.5	81.6	111.1	101.1	94.7	85.4
1982	74.7	100.9	92.3	82.5	120.5	114.8	107.9	86.5

n.a. not available

Source: Derived from DNP, Diagnostico del Sector Agrario, Volume II, Table 76 and IDEMA.

Table 18 COLOMBIA: PRICES OF AGRICULTURAL COMMODITIES AT THE WHOLESALE LEVEL, 1970-1983
(pesos per ton)

Year	White Rice	Sugar	Beans	Corn	Oil	Wheat	Milk
1970	3,618	2,180	5,273	1,735	13,468	3,402	2,329
1971	3,958	2,309	9,620	1,944	14,115	3,430	2,570
1972	3,996	2,647	10,634	2,271	13,990	3,761	2,926
1973	5,327	3,106	9,267	3,560	17,942	4,783	3,242
1974	8,377	3,915	18,617	3,952	28,645	6,784	4,548
1975	8,530	5,027	21,162	4,937	33,812	12,258	5,790
1976	8,876	6,557	21,472	5,740	40,212	14,201	7,260
1977	14,073	11,175	28,265	9,304	45,560	14,751	8,380
1978	16,618	10,434	28,837	8,121	51,806	14,981	9,478
1979	17,154	12,510	44,202	12,795	61,450	19,680	11,837
1980	24,220	19,570	46,260	15,380	63,609	27,210	15,614
1981	35,370	23,720	44,030	18,380	78,549	31,790	21,135
1982	41,520	29,910	75,600	21,620	100,666	32,910	25,830
1983	43,400	40,730	59,840	25,740	128,010	38,900	n.a.

n.a. not available

1/ Average until September.

Note: For Beans: Calima Bean (1980 - 1983)
For Sugar: Refined Sugar (1980 - 1983)

Source: E. Sarmiento, op. cit. for 1970-79; IDEMA, "Comportamiento de los Precios Nacionales al Nivel Mayorista Registrados en Bogota de diez y nueve productos agricolas basicos", (mimeo) for 1980 - 1982; and CICOLAC.

Table 19 COLOMBIA: RATIO OF SUPPORT PRICES TO PRODUCER PRICES, 1970-1983

Year	Sesame	Paddy Rice	Barley	Beans	Corn	Sorghum	Soybean	Wheat
1970	0.77	1.22	1.26	1.13	0.91	0.88	0.68	1.09
1971	0.82	1.17	1.14	0.65	0.94	0.87	0.85	1.09
1972	0.90	1.20	1.05	0.75	0.81	0.61	0.81	1.04
1973	0.83	0.96	0.81	0.92	0.66	0.67	0.66	1.10
1974	0.73	1.14	1.03	0.82	0.96	0.83	0.99	1.05
1975	1.01	1.06	0.92	0.84	0.95	1.00	1.01	0.92
1976	n.a.	1.13	0.96	0.97	0.84	0.90	0.97	1.08
1977	n.a.	0.85	0.96	0.92	0.68	0.79	0.76	1.01
1978	1.06	0.99	1.10	0.98	0.98	0.95	0.95	1.05
1979	0.99	1.02	0.99	0.70	0.76	0.74	0.86	1.02
1980	1.01	1.14	1.00	0.68	0.77	0.85	0.85	1.11
1981	1.01	1.14	1.04	0.89	0.92	0.94	0.96	1.06
1982	0.88	1.07	1.07	0.82	n.a.	0.98	0.77	1.08
1983	0.94	1.05	1.05	0.92	n.a.	1.00	0.95	1.11

n.a. not available

Source: IDEMA.

Table 20 COLOMBIA: INDEX OF INTERNATIONAL PRICE OF SELECTED AGRICULTURAL COMMODITIES, 1970-1982

Year	Butter	Beef	Barley	Corn	Rice	Wheat	Sugar	Palm Oil	Coffee	Sorghum	Soybeans	Bananas	Tobacco	Cotton	Sisal
1970	46.4	85.3	43.3	48.8	45.3	36.9	18.2	60.6	69.3	49.6	53.2	67.9	77.7	54.5	26.2
1971	65.4	103.3	40.2	48.8	45.8	41.3	22.2	60.9	60.0	47.5	57.3	57.3	70.8	63.9	29.3
1972	75.2	133.4	70.1	46.9	51.6	46.8	35.8	50.6	68.2	50.6	63.6	66.0	77.1	68.4	41.3
1973	61.4	183.1	88.7	81.8	94.7	93.9	46.7	88.0	88.9	88.5	132.3	67.3	80.5	117.0	90.8
1974	73.6	216.0	84.0	110.9	132.6	120.7	146.4	155.9	95.3	113.0	125.9	75.2	92.0	122.8	181.9
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	106.1	106.2	86.6	94.1	73.7	89.1	57.0	94.8	193.0	93.6	105.0	105.6	101.9	146.1	80.8
1977	116.8	136.0	87.1	79.9	79.5	69.2	39.9	125.5	294.0	79.0	126.8	116.6	110.9	134.3	88.4
1978	151.9	135.2	73.7	84.5	95.3	85.6	38.6	139.9	226.7	86.0	121.8	117.0	119.5	135.6	84.4
1979	181.2	223.6	116.0	97.0	91.1	107.4	47.6	152.4	224.5	105.2	135.0	132.9	129.8	145.4	121.7
1980	210.0	250.6	117.0	105.3	118.4	115.7	140.9	135.9	218.9	132.2	135.0	153.1	137.4	176.7	131.8
1981	195.4	216.4	153.1	109.5	135.0	117.2	83.3	133.0	156.8	128.8	131.0	158.7	154.7	158.3	113.6
1982	181.0	164.8	142.8	92.0	87.5	113.7	41.0	103.7	171.0	109.9	111.4	153.0	191.2	136.7	103.7

Source: IMF, International Financial Statistics Yearbook, 1983.

Table 21 COLOMBIA: RATIO OF DOMESTIC TO INTERNATIONAL PRICES OF SELECTED AGRICULTURAL COMMODITIES, 1970-1982

Year	Producer Price/International Price							Wholesale Price/ International Price	
	Wheat	Corn	Sorghum	Soybeans	Rice	Barley	Cotton	Sugar	Beef
1970	1.84	1.38	1.78	1.37	0.82	1.03	0.93	1.4	0.9
1971	1.53	1.46	1.17	1.21	0.78	1.21	0.84	1.1	0.8
1972	1.66	1.77	1.49	1.05	0.62	0.69	0.74	1.3	0.7
1973	0.86	1.44	1.07	0.63	0.42	0.74	0.76	0.6	0.7
1974	0.97	0.98	0.87	0.84	0.40	0.86	0.71	0.2	0.7
1975	1.51	1.11	0.94	1.02	0.46	0.90	0.95	0.5	1.4
1976	1.51	1.24	1.02	1.00	0.58	1.08	1.00	0.8	1.5
1977	2.07	2.25	1.59	1.18	0.85	1.12	1.02	2.1	1.6
1978	1.54	1.79	1.43	1.21	0.69	1.38	0.95	2.0	1.8
1979	1.42	2.03	1.54	1.20	0.78	0.93	1.01	0.6	1.2
1980	1.54	2.37	1.39	1.31	0.69	0.96	1.29	0.7	1.2
1981	1.92	2.21	1.49	1.47	0.71	0.86	1.14	1.4	1.4
1982	2.08	1.83	1.93	1.89	1.20	0.98	n.a.	3.0	n.a.

n.a. Not available.

Source: Garcia-Garcia, op. cit.

Table 22 COLOMBIA: AVERAGE COSTS OF PRODUCTION FOR SELECTED AGRICULTURAL COMMODITIES, 1970 - 1982
(pesos per ton)

Year	Cotton[a/]	Rice	Beans	Corn	Sorghum	Soybean	Wheat	Sesame
1970	5,324	2,299	6,271	2,588	1,235	1,780	2,794	3,551
1971	5,475	1,877	6,529	2,969	1,179	2,127	3,198	3,553
1972	4,798	2,218	6,384	3,012	1,405	2,376	2,987	3,870
1973	6,093	2,894	8,727	3,426	1,989	2,599	2,956	7,040
1974	8,829	2,949	11,968	2,682	2,462	4,225	4,019	9,397
1975	12,551	3,862	13,056	3,227	2,907	5,536	5,450	12,064
1976	15,497	4,282	10,460	3,948	3,877	6,917	6,364	13,204
1977	22,806	4,812	16,200	4,823	4,477	10,404	6,832	n.a.
1978	44,098	6,026	19,458	6,174	5,169	10,601	8,459	18,166
1979	28,892	7,370	25,062	6,567	5,544	11,878	8,161	21,227
1980	30,822	11,364	30,040	9,525	8,401	14,570	11,639	29,083
1981	40,000	13,874	34,079	13,208	12,079	19,235	16,459	35,864
1982	n.a.	17,172	42,005	15,076	13,848	22,922	17,829	40,326
1983	n.a.	20,742	51,538	18,095	17,036	28,737	20,445	43,984

n.a. Not available.

a/ The 1970-1979 and 1980-1982 information for products other than cotton is not strictly comparable. Sarmientos estimates are weighted averages of production costs for different qualities of the same product, the weights being the share in total production. The 1980-1982 data are arithmetic averages of semesterly costs of production. Production costs for cotton correspond to the Costa-Meta region costs.

Source: E. Sarmiento, op. cit., for 1970-1979; IDEMA, Costos de Produccion, Precios al Productor y compras IDEMA por Cosechas (mimeo.), Oficina de Planeacion, March 1983 for the 1980-1982 years.

Table 23 COLOMBIA: RATIO OF PRODUCTION COSTS TO INTERNATIONAL PESO PRICE FOR SOME AGRICULTURAL COMMODITIES, 1970-1982

Year	Rice	Corn	Sorghum	Soybean	Wheat	Cotton
1970	1.011	2.402	1.090	0.825	2.663	0.446
1971	0.755	2.551	1.004	0.847	2.534	0.362
1972	0.722	2.459	1.024	0.776	1.977	0.270
1973	0.473	1.479	0.767	0.378	0.914	0.185
1974	0.313	0.780	0.674	0.585	0.866	0.232
1975	0.459	0.872	0.758	0.814	1.273	0.342
1976	0.615	1.013	0.963	0.863	1.495	0.257
1977	0.605	1.376	1.243	1.014	1.886	0.389
1978	0.594	1.568	1.240	1.012	1.732	0.700
1979	0.699	1.336	1.000	0.940	1.227	0.393
1980	0.745	1.608	1.084	1.038	1.463	0.310
1981	0.692	1.853	1.388	1.226	1.954	0.390
1982	1.124	2.138	1.586	1.460	1.767	n.a.

n.a. Not available.

Source: Garcia-Garcia, op. cit.

Table 24 COLOMBIA: RATIO OF SUPPORT TO INTERNATIONAL PRICES FOR SELECTED AGRICULTURAL COMMODITIES, 1970-1982

Year	Rice	Barley	Corn	Sorghum	Soybean	Wheat
1970	0.99	1.29	1.25	1.03	0.93	2.00
1971	0.91	1.38	1.37	1.02	1.04	1.66
1972	0.73	0.72	1.44	0.92	0.85	1.73
1973	0.39	0.60	0.94	0.72	0.42	0.95
1974	0.43	0.88	0.94	0.72	0.83	1.02
1975	0.49	0.83	1.05	0.94	1.03	1.40
1976	0.67	1.03	1.04	0.92	0.97	1.63
1977	0.67	1.07	1.54	1.26	0.90	2.09
1978	0.69	1.52	1.76	1.37	1.15	1.62
1979	0.79	0.93	1.54	1.14	1.03	1.44
1980	0.79	0.96	1.81	1.18	1.12	1.71
1981	0.74	0.89	2.04	1.40	1.42	2.03
1982	1.17	1.00	3.93	1.82	1.84	1.96

Source: Ibid.

Table 25 COLOMBIA: REAL PESO VALUE OF INTERNATIONAL PRICES OF SELECTED AGRICULTURAL COMMODITIES, 1970-1982
(1975 = 100)

Year	Butter	Beef	Barley	Corn	Rice	Wheat	Sugar	Palm Oil	Coffee	Sorghum	Soybeans	Bananas	Tobacco	Cotton	Sisal
1970	32,014	31,671	3,586	2,493	8,093	2,428	3,586	11,100	54,167	2,623	4,993	7,213	76,465	27,660	6,479
1971	44,029	37,525	3,253	2,435	7,998	2,640	4,253	10,889	45,780	2,456	5,253	5,962	68,630	31,646	7,084
1972	49,167	47,020	5,507	2,269	8,750	2,798	6,722	8,798	50,543	2,541	5,670	6,643	72,617	32,885	9,700
1973	36,097	58,062	6,265	3,570	14,455	4,983	7,867	13,752	59,300	3,995	10,599	6,120	68,151	50,667	19,193
1974	38,065	60,220	5,219	4,226	17,786	5,699	21,482	21,419	55,834	4,485	8,669	5,986	68,479	46,710	33,791
1975	49,952	26,940	6,000	3,699	12,956	4,281	14,197	13,272	56,602	3,834	6,805	7,702	71,912	36,745	17,949
1976	47,378	22,541	4,644	3,107	8,532	3,391	8,265	11,240	97,657	3,207	6,385	7,269	65,510	47,986	12,961
1977	42,842	26,881	3,837	2,164	7,558	2,236	4,109	12,224	122,872	2,224	6,335	6,312	58,530	36,235	11,644
1978	50,539	24,260	2,947	2,075	8,225	2,575	3,628	12,374	85,517	2,198	5,524	5,998	57,279	33,226	10,089
1979	52,889	35,193	4,067	2,088	6,894	2,825	3,904	18,819	74,254	2,358	5,368	5,983	54,552	31,234	12,768
1980	53,389	32,842	3,574	1,973	7,810	2,650	10,076	9,180	63,072	2,580	4,676	5,999	50,287	33,063	12,041
1981	47,945	27,836	4,388	1,932	8,355	2,284	5,585	8,432	42,389	2,360	4,255	5,836	53,131	27,792	9,738
1982	41,370	20,310	3,921	1,557	5,190	2,228	2,661	6,299	44,300	1,928	3,468	5,392	59,160	22,985	8,516

Source: García-García, op. cit. using information on the implicit price deflator of gross internal product as given in DANE. Cuentas Nacionales, Table 26, for 1970-1980, and unpublished information from DANE for 1981 and 1982.

Table 26 COLOMBIA: INDEX OF REAL PESO VALUE OF INTERNATIONAL PRICES OF SELECTED AGRICULTURAL COMMODITIES, 1970-1982

Year	Butter	Beef	Barley	Corn	Rice	Wheat	Sugar	Palm Oil	Coffee
1970	64.1	117.6	59.8	67.4	62.5	56.7	25.3	83.6	95.7
1971	88.1	139.3	54.2	65.8	61.7	61.7	30.0	82.0	80.9
1972	98.4	174.5	91.8	61.3	67.5	65.4	47.3	66.3	89.3
1973	72.3	215.5	104.4	96.5	111.6	116.5	5[illegible].4	103.6	104.8
1974	76.2	223.5	87.0	114.2	137.3	133.1	151.3	161.4	98.6
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	94.8	83.7	77.4	84.0	65.8	79.2	58.2	84.7	172.5
1977	85.8	99.8	64.0	58.5	58.3	52.2	28.9	92.1	217.1
1978	101.2	90.1	49.1	56.1	63.5	60.1	25.6	93.2	151.1
1979	105.9	130.6	67.8	56.4	53.2	66.0	27.5	141.8	131.2
1980	106.9	121.9	59.6	53.3	60.3	61.9	71.0	69.2	111.4
1981	96.0	103.3	73.1	52.2	64.5	53.4	39.3	63.5	74.9
1982	82.8	75.4	65.4	42.1	40.1	52.0	18.7	47.5	78.3

Year	Sorghum	Soybeans	Bananas	Tobacco	Cotton	Sisal
1970	68.4	73.4	93.7	106.3	75.3	36.1
1971	64.1	77.2	77.4	95.4	86.1	39.5
1972	66.3	83.3	86.3	101.0	89.5	54.0
1973	104.2	155.8	79.5	94.8	137.9	106.9
1974	117.0	127.4	77.7	95.2	127.1	188.3
1975	100.0	100.0	100.0	100.0	100.0	100.0
1976	83.6	93.8	94.4	91.1	130.6	72.2
1977	58.0	93.1	82.0	81.4	98.6	64.9
1978	57.3	81.2	77.9	79.7	90.4	56.2
1979	61.5	78.9	77.7	75.9	85.0	71.1
1980	67.3	68.7	77.9	69.9	90.0	67.1
1981	61.6	62.5	75.8	73.9	75.6	54.3
1982	50.3	51.0	70.0	82.3	62.6	47.4

Source: Ibid.

Table 27 COLOMBIA: INDEX OF THE RATIO OF INTERNATIONAL PRICE IN PESOS TO PRODUCTION COSTS FOR SOME AGRICULTURAL COMMODITIES, 1970-1982

Year	Rice	Corn	Sorghum	Soybean	Wheat	Cotton
1970	45.4	36.3	69.5	98.6	47.8	76.7
1971	60.8	34.2	75.5	96.1	50.2	94.5
1972	63.6	35.5	74.0	104.9	64.4	126.5
1973	97.0	59.0	98.8	215.5	139.3	184.5
1974	146.6	111.9	112.5	139.1	147.1	147.2
1975	100.0	100.0	100.0	100.0	100.0	100.0
1976	74.6	86.1	78.7	94.3	85.2	132.9
1977	75.9	63.4	61.0	80.3	67.5	88.0
1978	77.3	55.6	61.1	80.5	73.5	48.9
1979	65.7	65.3	75.8	86.6	103.7	87.0
1980	61.6	54.2	69.9	78.4	87.0	110.1
1981	66.3	47.1	54.6	66.4	65.1	87.6
1982	40.8	40.8	47.8	55.7	74.7	n.a.

n.a. Not available.

Source: Ibid.

Table 28 COLOMBIA: RATIO OF BASIC PRICES TO MARKET PRODUCER PRICES, 1970-1981

Products	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Barley	135.1	114.1	104.5	80.3	89.7	92.4	79.8	86.1	77.8	67.1	86.1	123.3
Beans	113.1	65.4	65.4	59.8	39.7	74.8	67.8	59.7	60.3	39.0	45.8	n.a.
Cocoa	92.5	94.1	90.9	74.5	65.0	106.2	98.8	67.0	64.0	54.1	77.9	95.9
Corn	87.2	76.7	66.8	73.6	93.6	94.1	82.0	55.7	70.1	49.3	51.2	91.8
Cotton Fiber	126.8	106.2	94.1	89.9	82.9	106.8	68.6	83.9	94.8	68.3	102.3	102.0
Cotton Seed	131.3	95.0	93.4	105.9	80.2	97.5	80.9	72.1	63.2	50.6	73.6	100.7
Palm Oil	97.1	93.9	90.2	61.8	41.1	38.4	34.9	27.0	23.5	18.6	36.6	103.9
Rice (Paddy)	109.2	104.6	107.3	80.4	67.7	101.1	101.4	66.7	67.9	58.2	73.5	88.9
Sesame	95.0	93.0	87.4	74.6	44.2	101.0	87.5	74.6	61.5	49.4	94.5	94.8
Sorghum	-	84.9	57.1	42.1	85.0	100.0	87.6	67.0	76.1	58.3	60.3	86.7
Soybeans	88.3	85.2	81.2	64.4	82.4	100.9	86.9	57.8	58.7	47.7	60.5	111.9
Wheat	108.6	108.6	89.5	85.9	53.4	89.7	90.4	82.5	87.6	69.9	73.3	92.4

N.A. Not available.

Source: Calculations DNP/UEA/DC.

Table 29 COLOMBIA: EFFECTIVE RATE OF INTEREST FOR BANKS ON BONOS DE PRENDA

Year	Market Interest Rate[a]/	Effective Rate[b]/ Bonos de Prenda
1970	13.3	22.0
1971	16.4	22.0
1972	15.6	22.0
1973	20.3	22.0
1974	30.4	22.4
1975	23.8	22.6
1976	22.4	22.6
1977	22.9	22.6
1978	25.9	22.6
1979	36.5	22.6
1980	41.5	29.8
1981	52.5	32.1

a/ CAT, 120 day maturity, average annual rate.

b/ $R_e = \frac{R_m - (R_r)(M_r)}{1 - M_r}$, where R_e = effective rate of interest, R_m = market rate of interest, R_r = re-discount interest rate, M_r = margin of re-discount.

Source: Calculations by DNP/UEA/DC, based on Banco de la Republica, Resoluciones de la Junta Monetaria, Asobancaria.

Table 30 COLOMBIA: VALUE OF DISCOUNTS AND RE-DISCOUNTS UNDER THE BONOS DE PRENDA SYSTEM, AND THE DISTRIBUTION OF THE COST OF THE IMPLIED SUBSIDY, 1981
(thousands of pesos)

Product	Value Discounted	Value Re-Discounted	Total Cost[a/]	Paid by Government[b/]	Paid by Banks[c/]
Beans	6,759	1,660	1,602	476	1,126
Corn	225,875	80,421	53,532	23,081	30,451
Cotton Fiber	1,995,175	758,997	472,856	217,832	255,024
Cotton Seed	568,298	215,353	134,687	61,806	72,881
Rice (Paddy)	1,419,137	475,056	336,335	136,341	199,994
Sesame	45,561	22,382	10,798	6,424	4,374
Sorghum	897,613	325,966	212,734	93,552	119,182
Soybeans	681,131	264,781	161,428	75,992	85,436
Tobacco	1,066,679	238,222	252,803	68,370	184,433
Other Agricultural Products[d/]	483,461	168,969	114,580	48,494	66,086
Other products[e/]	2,329,949	115,373	552,198	33,112	519,086
Total	9,719,638	2,667,180	2,303,553	765,480	1,538,073

a/ Total cost = Value Discounted x ($r_m - r_s$), where r_m = market interest rate, r_s = subsidized interest rate for bonos de prenda.

b/ Paid by Government = Value Re-discounted x ($r_m - r_s$), where r_r = re-discount interest rate.

c/ Paid by Banks = Total Subsidy - Paid by Government.

d/ Barley, Cocoa, Malt, Wheat

e/ Manufactured products and products for export.

Source: Mission estimates.

Table 31 COLOMBIA: INDEX OF RE-DISCOUNT OF BONOS DE PRENDA FOR 14 AGRICULTURAL PRODUCTS, 1968-1978

Month	Index
January	95
February	121
March	122
April	117
May	93
June	77
July	84
August	102
September	107
October	98
November	84
December	85

Source: A. Silva, R. Monsalvo, and G. Montes, "El Almacenamiento de Productos Agropecuarios en Colombia," Revista de Planeacion y Desarrollo, Vol. XI, No. 3, September-December 1979, Annex No. 6.

Table 32 COLOMBIA: SUPPLY AND DISTRIBUTION OF EXPORT GRADE GREEN COFFEE, 1958-59 TO 1981-82
(thousands of 60-kilogram bags)

Coffee Year (Oct./Sept.)	Stocks Carry-In	Production a/	Domestic Consumption	Exports			Stocks Carry-Out b/
				Normal Markets	Other Markets	Total	
1958/59	11	7,442	908	6,372	59	6,431	114
1959/60	114	7,648	1,197	5,597	74	5,671	894
1960/61	894	7,500	1,270	5,990	53	6,043	1,081
1961/62	1,081	8,035	1,526	5,536	58	5,594	1,996
1962/63	1,996	7,500	1,416	5,952	104	6,056	2,024
1963/64	2,024	7,800	1,375	6,228	82	6,310	2,139
1964/65	2,139	8,547	1,354	5,612	131	5,743	3,589
1965/66	3,589	8,224	1,202	5,670	195	5,865	4,746
1966/67	4,746	7,507	1,250	5,421	213	5,634	5,369
1967/68	5,369	7,995	1,270	6,344	251	6,595	5,499
1968/69	5,499	7,375	1,290	6,204	330	6,534	5,050
1969/70	5,050	8,266	859	6,467	407	6,874	5,583
1970/71	5,583	6,872	989	6,008	322	6,331	5,135
1971/72	5,135	5,958	1,035	6,198	289	6,487	3,571
1972/73	3,571	8,564	1,046	6,046	209	6,255	4,834
1973/74	4,834	7,066	1,252	6,873	535	7,408	3,240
1974/75	3,240	7,981	1,279	7,102	440	7,542	2,400
1975/76	2,400	7,804	1,369	6,554	469	7,023	1,812
1976/77	1,812	8,939	1,305	4,891	401	5,292	4,154
1977/78	4,154	10,463	1,420	7,144	414	7,558	5,639
1978/79	5,639	12,300	1,638	10,714	717	11,431	4,870
1979/80	4,870	11,848	1,728	10,692	848	11,540	3,450
1980/81	3,450	13,037	1,478	8,310	721	9,031	5,978
1981/82	5,978	12,893	1,592	8,052	938	8,990	8,289
1982/83	8,289	12,810	1,695	8,465	709	9,174	10,230

a/ Reduced production. Series deduced from data on stocks, consumption and exports.
b/ Stocks include private holdings.
c/ Preliminary.
d/ Estimate.

Source: FEDERACAFE.

Table 33 COLOMBIA: ALTERNATIVE CROPS FOR COFFEE DIVERSIFICATION
(all figures in US$ per ha, converted at exchange rate of Col$75/US$1)

Crop	Installation Cost		Net Revenues		Annualized Net Present Value [a/]	Net Annual Benefit From Diversification	
	Years	Total Cost	Beginning in Year	Value		Social	Private
Avocado	3	2,128	6	3,961	2,473	4,056	2,396
Citrus	3	2,500	7	2,377	1,297	2,880	1,220
Cocoa	2	1,769	6	958	514	2,097	437
Onion (cebolla junca)	1	7,515	2	8,837	7,159	8,742	7,082
Raspberry (mora)	1	3,180	3	3,987	3,005	4,588	2,928

a/ $ANPV = \left[\left(\frac{NR}{0.07}\right)\frac{1}{1.07^{x-1}}\right] - \left(\frac{IC}{n}\right)\sum_{i=0}^{n-1}\frac{1}{(1.07)^{i}}$

where NR = net revenues; x = year in which NR begins; IC = installation cost (total); n = number of years over which IC is spread.

Source: FEDERACAFE and mission estimates.

Table 34 COLOMBIA: AGRICULTURAL SHARE IN THE NATIONAL BUDGET ALLOCATIONS *
(millions of Colombian pesos)

Year	Total Budget		Agriculture Sector[1]/			Agriculture Sector Public Agencies Only[2]/		Participation of Public Agencies in Agric. Sector Budget	Ministry of Agriculture[5]/	
	Current Pesos (A)	Constant 1970 Pesos[3]/ (B)	Current Pesos (C)	Constant 1970 Pesos[3]/ (D)	Participation in Total Budget (C/A)	Current Pesos[4]/ (E)	Constant 1970 Pesos[3]/ (F)	(E/C)	Current Pesos (G)	Participation in Agric. Sector Budget (G/C)
					(%)			(%)		(%)
1970	20,644.2	20,644.2	5,186.9	5,186.9	25.1	1,518.7	1,518.7	29		
1971	25,522.1	22,446.9	5,413.9	4,761.6	21.2	1,287.3	1,132.2	24		
1972	31,279.5	24,191.4	6,388.0	4,940.4	20.4	1,550.3	1,199.0	24		
1973	38,492.0	24,753.7	8,103.2	5,211.1	21.1	1,764.3	1,134.6	22		
1974	50,726.5	26,255.9	8,688.6	4,497.2	17.1	2,071.8	1,072.4	24		
1975	60,719.5	25,384.4	7,124.4	2,978.4	11.7	2,696.0	1,127.1	38		
1976	86,185.9	30,050.9	12,852.4	4,481.3	14.9	2,715.6	947.2	21	59.2	0.5
1977	112,805.7	32,763.8	16,738.9	4,861.7	14.8	3,348.3	972.5	20	81.3	0.5
1978	174,875.7	40,830.2	16,972.0	3,962.6	9.7	3,993.0	932.3	24	100.6	0.6
1979	234,160.1	42,404.9	20,693.7	3,747.5	8.8	5,448.0	986.6	26	119.4	0.6
1980	332,382.3	47,496.8	28,277.4	4,040.7	8.5	7,054.7	1,008.1	25	184.3	0.7
1981	438,678.7	50,020.4	33,218.3	3,787.7	7.6	8,990.1	1,025.1	27	232.7	0.7
1982						10,164.3	919.8		270.8	
1983P						12,929.9	959.2			
Least Square Annual Growth Rate		8.3%		-2.7%			1970-83: -2.5%			

* Tables 34 through 42 were compiled by Aichin Wee.
P Projection.

1/ Agriculture sector includes (a) Ministry of Agriculture (Direccion Superior); (b) its ascribed agencies (Entidades Ascritas): ICA, INCORA, INDERENA, HIMAT; (c) agriculture-related investments of the Autonomous Regional Corporations (essentially CVC, Corpouraba, CAR, Codechoco); (d) other public enterprises or entities (Entidades Vinculades) which receive investment funds from budget allocations at various times: mainly IDEMA, CORFIAGRO, EMCOPER. The figures include (a) Investment Funds (Inversion), from both (i) Budget allocations (Presupuesto Nacional), or (ii) Own resources (Recursos Propios); and (b) Recurrent Funds (Funcionamiento) from both (i) Budget and (ii) own resources, as above.
2/ Includes only the Entidades Adscritas - ICA, INCORA, INDERENA, HIMAT, which account for about 23% of total public allocations in Agriculture Sector (see Table 4).
3/ Deflated using implicit price deflator for government current purchases of goods and services with assumed annual rates of inflation for 1982-1986.
4/ 1970-81 figures derived from Column (F), actual figures for 1982 and 1983; as well as projected allocations for investment and recurrent expenditures for 1984-1986 supplied by DPSA.
5/ "Direccion Superior". Figures are for investment and recurrent expenditures.

Source: DPSA, Ministry of Agriculture, based on data from Contraloria General de la Republica, INFORMES FINANCIERO

Table 35 COLOMBIA: PUBLIC SECTOR EXPENDITURES IN AGRICULTURE BY MAIN AREAS OF ACTIVITY
(in percentages, based on total investment and recurrent allocations and expenditures)

Item	Actual Expenditures						Projected Allocations[b]			Main Executing Agencies
	1976	1977	1978	1979	1980	1981	1984	1985	1986	
1. Research	4.5	2.7	3.6	4.9	3.9	5.3	21.3	20.2	15.0	ICA (Agriculture, Livestock; INDERENA (Forestry, Fisheries and Fauna)
2. Control & Supervision of Inputs	1.0	0.8	0.2	0.2	0.2	0.3	4.3	4.2	3.6	ICA
3. Agric/Livestock Sanitation	0.4	0.6	0.2	0.1	0.7	1.1	1.3	1.2	1.0	ICA
4. Transfer of Technology	2.5	2.7	2.7	2.8	2.4	3.4	2.7	3.5	8.4	ICA (at national level); INDERENA (regional level); INCORA (on specific projects)
5. Administration of Renewable Natural Resources	0.5	1.1	1.5	1.9	1.8	2.3	1.8	2.0	1.7	INDERENA
6. Studies & Design of Districts and Structures	0.2	0.9	1.4	1.7	1.3	1.3	18.3	33.1	38.7	HIMAT
7. Operation & Conservation of Drainage and Irrigation Districts	0.9	2.1	0.9	1.9	1.8	3.2	-	-	-	HIMAT
8. Social Services & Physical Infrastructure	3.1	2.5	5.1	3.9	4.8	6.9	0.3	0.3	0.3	INCORA
9. Agro-Livestock Dev. Credit	3.2	5.1	3.0	3.3	3.8	4.0	25.2	17.3	10.8	INCORA (In colonization projects)
10. Commercial Services & Physical Infrastructure[a]	50.8	46.1	33.2	23.3	33.8	21.6	-	-	-	IDEMA (Marketing), COFIAGRO, and EMCOPER (from 1984)
11. DRI/PAN	-	1.0	1.7	2.3	2.0	3.4	3.1	2.8	2.7	INCORA, INDERENA
12. Others	0.5	0.7	1.7	2.3	1.8	2.0	16.6	8.5	7.3	Mainly Hydrology and Meteorology by HIMAT
13. Debt Service and Transfer Expenditures	22.1	25.1	34.5	39.9	30.4	32.2	5.1	6.9	10.5	For external and internal debt (as in -a below)
14. Recurrent Capital	10.3	8.6	10.3	11.5	11.3	13.0				
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Total current millions of pesos	10,926	14,897	14,023	15,862	20,818	22,913	23,321[c]	26,029[c]	31,467[c]	

a/ This item has been relatively large because of the "own resources" (Recursos Propios) of IDEMA - this includes internal credit such as "Bono de prenda" which IDEMA obtains from Banco de la Republica.

b/ Note that the percentage figures in each category are relatively bigger as the total excludes recurrent capital ("Funcionamiento") not yet projected.

c/ In 1983 pesos.

Source: OPSA, Ministry of Agriculture.

Table 36 COLOMBIA: SOURCES OF FINANCING FOR INVESTMENT AND RECURRENT ALLOCATIONS IN AGRICULTURE 1/
(millions of Colombian pesos)

	1976		1977		1978		1979		1980		1981		1982		1983P	
	Inv.	Rec.	Inv.	Rec.	Inv.	Rec.	Inv.	Rec.	Inv.	Rec.	Inv.	Rec.	Inv.	Rec.	Inv.	Rec.
1. Budget allocations																
ICA	390.2	41.8	485.8	78.4	565.0	89.7	708.4	203.0	1,110.4	248.3	1,379.5	304.7	1,845.7	380.9	1,959.5	389.5
INCORA	576.8	100.0	623.1	90.0	926.0	155.1	934.2	302.0	1,514.5	375.6	1,712.1	461.8	1,739.0	634.0	1,840.0	560.0
INDERENA	182.0	30.6	263.0	32.0	301.4	50.9	454.1	89.7	718.0	146.6	843.9	180.4	839.6	222.5	1,031.0	226.4
HIMAT	135.6	9.0	389.9	25.0	512.0	28.6	738.8	98.3	1,072.5	94.6	1,233.7	137.3	1,263.2	164.7	1,606.0	166.4
Total	1,284.6	181.4	1,761.9	225.4	2,304.4	324.3	2,835.5	693.0	4,415.1	865.2	5,169.1	1,084.2	5,687.5	1,402.1	6,436.3	1,342.3
	1,466.0		1,987.3		2,628.7		3,528.5		5,280.6		6,253.3		7,089.6		7,778.6	
Of which,																
External Credit	152.3		540.3		413.3		1,045.6		1,809.0		2,045.0		1,516.0		1,459.0	
(as a % of Total)	(10%)		(27%)		(16%)		(30%)		(34%)		(33%)		(21%)		(19%)	
2. Own Resources																
ICA	545.0	53.9	882.2	40.2	281.0	69.8	522.7	-	531.2	-	638.6	-	738.1	3.0	1,328.1	-
INCORA	680.9	133.6	901.4	106.0	500.6	87.5	623.6	61.4	707.8	80.2	1,425.5	64.8	1,079.3	126.4	1,574.1	337.4
INDERENA	115.8	19.5	148.5	25.2	197.9	32.2	246.3	19.4	181.1	11.8	186.5	13.4	209.1	15.2	341.9	14.1
HIMAT	33.1	7.7	230.5	-	116.5	18.6	112.4	9.4	114.6	16.9	249.6	3.0	125.0	32.0	1,307.1	40.4
Total	1,374.8	214.7	2,162.7	171.4	1,095.9	208.1	1,505.0	90.2	1,534.6	108.9	2,500.2	81.2	2,151.4	176.6	4,614.2	391.5
	1,589.5		2,334.1		1,304.0		1,595.2		1,643.5		2,581.2		2,328.0		5,005.7	
3. Total Financing (Budget allocations plus Own Resources)	3,055.3		4,321.4		3,932.7		5,123.7		6,924.1		8,834.5		9,417.6		12,784.3	
4. Ratios																
(i) Own Resources as % of Total Financing	52%		54%		33%		31%		24%		29%		25%		39%	
(ii) Budget allocation: Own Resources	0.92		0.85		2.01		2.21		3.21		2.42		3.05		1.55	

P Projection.

1/ For the four agencies ascribed to Ministry of Agriculture only ICA, INCORA, INDERENA, HIMAT.
Inv. = Investment allocations Rec. = Recurrent allocations

Note that external credit increased in importance from 1977 to 1981 but is expected to drop after 1982. There are slight variations between these figures for total financing and those in Table 7-1 (Column E), probably due to the implicit price deflator used).

Source: OPSA, Ministry of Agriculture.

Table 37 COLOMBIA: PUBLIC ALLOCATIONS TO AGRICULTURE BY ENTITIES (1970-1981)
(In millions of constant 1970 pesos)

Year	Agriculture, Total (Col$ m)	(%)	Ascribed Agencies ICA, INCORA, HIMAT, INDERENA (Col$ m)	(%)	Regional Corporations (Col$ m)	(%)	Other Entities (Col$ m)	(%)
1970	5,186.9	100.00	1,518.7	29.28	219.9	4.24	3,448.3	66.48
1971	4,814.0	100.00	1,132.2	23.52	477.2	9.91	3,204.6	66.57
1972	4,977.0	100.00	1,199.0	24.09	634.7	12.75	3,143.3	63.16
1973	5,211.1	100.00	1,134.6	21.77	839.1	16.10	3,237.4	62.13
1974	4,497.2	100.00	1,072.4	23.85	759.5	16.89	2,665.3	59.26
1975	2,988.4	100.00	1,127.1	37.72	532.9	17.83	1,328.4	44.45
1976	4,481.3	100.00	947.2	21.14	628.7	14.03	2,905.4	64.83
1977	4,315.4	100.00	972.5	22.53	623.0	14.44	2,719.9	63.03
1978	4,081.0	100.00	932.3	22.84	666.7	16.34	2,482.0	60.82
1979	3,856.1	100.00	986.6	25.59	793.6	19.91	2,101.7	54.50
1980	4,214.2	100.00	1,008.1	23.92	1,064.5	25.26	2,141.6	50.82
1981	3,787.7	100.00	1,025.1	27.06	1,179.7	31.15	1,582.9	41.79

Note: There are slight variations between the figures in this Table and those in Table 34, probably due to the implicit price deflators used.

Source: OPSA, Ministry of Agriculture, (based on data from Contraloria General de la Republica).

Table 38 COLOMBIA: FUNCTIONS OF VARIOUS AGRICULTURAL AGENCIES

	Research	Extension	Credit	Marketing of Inputs	Marketing of Output	Organization and Training	Land Redistribution	Infrastructure	Control and Enforcement	Production of Inputs	Development of Renewable Natural Resources	Agroindustry Development
ICA	X	X				X			X			
INCORA		Z	Z		F	Z	X	Z			Z	Z
INDERENA	X	Y				Z			X	X	X	
HIMAT								Z				
IDEMA					XY			X				
VECOL										X		
INAGRARIO												
Caja Agraria		X	X	X						X		
Banco Cafetero			X									
FEDECOPER					X							
COFIAGRO			X		F			X				Z
Banco Ganadero			X									
Fondos Ganderos			Y									
SENA		X				X						Y
Prodesarrollo	Y	Y	Y			Y		Y			Y	
S. de Agricultura		Y								Y	Y	
Corporacion Regionales	Y	Y							Y			
CONIF	X											
PROEXPO			X	F	F							
FFAP			X									

X = National Level
Y = Regional Level
Z = For specific projects.
F = Activities supported by the agency.

Source: DNP - Diagnostico del Sector Agrario, Tomo II, Cuadro No. 98

Table 39 COLOMBIA: PUBLIC AND PRIVATE EXPENDITURES IN THE AGRICULTURE SECTOR, 1970-1980
(millions of Current Colombian Pesos)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Least Square Growth Rate (1979-80)
Public Expenditures												
(i) Current	3,712	3,794	4,482	5,718	5,559	3,195	7,648	10,167	9,032	10,392	11,138	
(ii) Investment	1,475	1,620	1,906	2,385	3,130	3,929	5,204	6,572	7,940	10,302	17,139	
Total Current Pesos	5,187	5,414	6,388	8,103	8,689	7,124	12,852	16,739	16,972	20,694	28,277	
In Constant 1970 Pesos 1/	5,187	4,762	4,940	5,211	4,497	2,978	4,481	4,862	3,963	3,748	4,041	-2.7%
Private Expenditures												
(i) Current	19,373	23,844	30,877	42,768	60,604	75,505	97,395	144,045	168,698	209,333	250,141	
(ii) Investment	2,280	2,300	2,650	3,400	4,360	5,300	6,610	8,086	11,127	13,135	19,095	
Total Current Pesos	21,653	26,144	33,527	46,168	64,964	80,805	104,005	152,131	179,815	222,468	269,236	
In Constant 1970 Pesos 2/	21,653	23,218	26,994	31,644	32,240	33,171	35,137	38,928	37,106	36,357	34,669	5.1%
Total Public and Private Expenditures												
In Current Pesos	26,840	31,558	39,915	54,271	73,653	87,929	116,857	168,870	196,787	243,162	297,513	
In Constant 1970 Pesos 2/	26,840	28,027	32,138	37,197	36,552	36,096	39,479	43,211	40,608	39,739	38,310	3.8%
Percentage of Public in Total Expenditures	19.3	17.2	16.0	14.9	11.8	8.1	11.0	9.9	8.6	8.5	9.5	

1/ Deflated using implicit price deflator for Government current purchases of goods and services.
2/ Deflated using implicit price deflator for Gross Fixed Domestic Investment (CEM 1983, Vol. II, Table 2.11).

Source: Figures from Table 7-40.

Table 40 COLOMBIA: COMPOSITION OF AGRICULTURE'S SHARE OF GDP, 1970-1980a/
(millions of Current Colombian Pesos)

	1970	%	1971	%	1972	%	1973	%	1974	%	1975	%	1976	%	1977	%	1978	%	1979	%	1980 Agriculture's Share Value	(%)	1980 Total GDP Value	(%)	1980 Agriculture as % of Total GDP
Consumption (Current) Expenditures																									
(i) Public[f]/	3,712	14	3,794	12	4,482	11	5,718	10	5,559	8	3,195	4	7,648	7	10,167	6	9,032	5	10,392	4	11,138	4	159,371	11	7.0
(ii) Private[g]/	19,373	72	23,844	75	30,877	77	42,768	79	60,604	82	75,505	86	97,395	83	144,045	85	168,688	85	209,333	86	250,141	84	1,104,816	72	22.6
Sub-Total	23,085	86	27,638	87	35,359	88	48,486	89	66,163	90	78,700	90	105,043	90	154,212	91	177,720	90	219,725	90	261,279	88	1,264,187	83	20.7
Investment Expenditures (Fixed Capital Formation)																									
(i) Public[f]/	1,475	5	1,620	5	1,906	5	2,385	5	3,130	4	3,929	4	5,204	4	6,572	4	7,940	4	10,302	4	17,139	6			
(ii) Private[g]/	2,280	9	2,300	8	2,650	7	3,400	6	4,360	6	5,300	6	6,610	6	8,086	5	11,127	6	13,135	6	19,095	6	264,894	17	13.7
Sub-Total	3,755	14	3,920	13	4,556	12	5,785	11	7,490	10	9,229	10	11,814	10	14,658	9	19,067	10	23,437	10	36,234	12	264,894	17	13.7
Total Current & Investment Expenditure	26,840	100	31,558	100	39,915	100	54,271	100	73,653	100	87,929	100	116,857	100	168,870	100	196,787	100	243,162	100	297,513	100	1,529,081	100	19.5
Changes in Stocks[e]/	-		-		-		-		-		-		-		-		-		-		-		36,223		-
Exports of Goods and Services[d]/	5,981		5,162		5,342		4,554		5,348		7,809		7,690		8,114		8,942		7,283		8,381		274,637		
Less Imports of Goods and Services[c]/	(769)		(1,324)		(1,223)		(2,365)		(3,560)		(2,574)		(3,639)		(4,084)		(4,618)		(5,968)		(13,370)		(260,811)		
Expenditures Corresponding to GDP[b]/	32,052		35,396		44,034		56,460		75,441		93,164		120,908		172,900		201,111		244,477		292,524		1,579,130		18.5
Breakdown of GDP by[i]/																									
(i) Wages	9,910		10,888		13,195		16,878		22,164		28,410		36,910		56,653		78,160		101,396		131,085				
(ii) Indirect Taxes (net of subsidies)	-203		-198		-272		-274		-344		-566		-287		-214		-381		-674		433				
(iii) Gross Surplus of Production	22,345		24,706		31,111		39,856		53,621		65,320		84,285		116,461		123,332		143,755		161,006				
Gross Domestic Product[j]/	32,052		35,396		44,034		56,460		75,441		93,164		120,908		172,900		201,111		244,477		292,524				
Intermediate Consumption[k]/	5,269		6,281		7,874		11,178		16,904		20,827		24,543		29,774		38,067		50,364		68,887				
Gross Production[k]/	37,321		41,677		51,908		67,638		92,345		113,991		145,451		202,674		239,178		294,841		361,411				

a/ "Agriculture" defined here as Agropecuario, excluding silviculture, fisheries and hunting.
b/ Cuadro 30, p. 73
c/ Cuadro 45, p. 93
d/ Cuadro 43, p. 91
e/ Assumed to be negligible since "Changes in Stock" for the whole economy (GDP) from 1970-1980 is only about 2% in each of the years; see example of 1980.
f/ Estimated from Cuadro 39, p.87, as shown in Table 5.03.
g/ Taken as the residual of total Government expenditure on the agricultural sector (Table 4.01, Colum C), less estimated public investment expenditures in f/ above.
h/ Derived as net of all preceding calculations, to add up to "Expenditures Corresponding to GDP" in b/.
i/ Cuadro 36, pp. 81-83.
j/ Equal to b/.
k/ Cuadro 34, pp. 77-78.
l/ Cuadro 3, pp. 48.

Source: DANE,"Cuentas Nacionales de Colombia" (Revision 3) 1970-1980.

Table 41 COLOMBIA: ESTIMATED GROSS FIXED CAPITAL FORMATION IN AGRICULTURE
(Millions of Current Colombian Pesos)

Item	1970 Value	1970 %	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980 Value	1980 %
1. Land Improvement and Development in plantations and farms[a/]	1,147	3.1	1,204	1,469	1,763	1,999	2,225	2,497	2,952	4,028	5,236	6,769	18.1
2. Agricultural Machinery and Equipment[b/]	371	9.9	254	291	401	735	1,224	1,494	1,742	2,125	1,646	4,226	11.7
(Domestic)	(107)	(2.8)	(96)	(134)	(125)	(200)	(326)	(339)	(395)	(363)	(158)	(1,650)	(4.6)
(Imported)	(264)	(7.1)	(158)	(157)	(276)	(535)	(898)	(1,155)	(1,347)	(1,762)	(1,488)	(2,576)	(7.1)
3. Construction of rural dwellings[c/]	568	15.1	634	634	947	1,187	1,243	1,612	2,311	3,554	4,249	4,997	13.8
4. Other agricultural constructions[d/]	1,510	40.2	1,669	1,929	2,456	3,259	4,117	5,501	6,975	8,374	10,864	18,291	50.5
5. Transport equipment for agriculture[e/]	159	4.2	159	206	218	310	420	710	678	986	1,442	1,951	5.3
6. Estimated Total Fixed Capital Formation in Agriculture, of which:	3,755	100.0	3,920	4,556	5,785	7,490	9,229	11,814	14,658	19,067	23,437	36,234	
(a) Estimated Public Sector	1,475		1,620	1,906	2,385	3,130	3,929	5,204	6,572	7,940	10,302	17,139	
(b) Estimated Private Sector[f/] - value	2,280		2,300	2,650	3,400	4,360	5,300	6,610	8,086	11,127	13,135	19,095	
- % of total	60%		59%	58%	59%	58%	57%	56%	55%	58%	56%	53%	
7. Total Fixed Capital Formation in the Economy[g/]	23,919		27,302	30,486	38,416	52,843	62,129	84,571	104,041	139,897	183,325	264,894	
8. Percentage of Agriculture in Total Fixed Capital Formation (6/7)	16%		14%	15%	15%	14%	15%	14%	14%	14%	13%	14%	
9. Estimated Total Fixed Capital Formation in Agriculture in 1970 Prices[h/]	3,755		3,500	3,674	3,962	3,726	3,788	3,990	3,758	3,931	3,830	4,665	

a/ "Mejoras de tierras y desarrollo de plantaciones y huertas"; Item 0210 in DANE worksheets; mainly done by private sector.

b/ "Maquinaria y equipo Agricolas—Nacional and Importado"; Item 23.1 in DANE worksheets.

c/ "Construccion Vivienda Rural" taken at 14% of total Urban and Rural, based on 1972 figures; Item 2711 in DANE worksheets.

d/ Taken at 20% of "Otras Construcciones salvo las que tienen por finalidad mejorar tierras" in Cuadro 39, op. cit. The 20% is based on the proportion of "Otras Construcciones Agricola" over total "Obras Civiles", based on 1972 figures, Item 27.2 in DANE worksheets. Most (an estimated 90%) of these constructions are made through direct investments by HIMAT, INCORA, INDERENA, ICA.

e/ Taken at 5% of total "Equipo de transporte" in Cuadro 39 for jeeps and other rural transportation (DANE estimates).

f/ Taken as 90% of Item 1, 100% of Item 2, 100% of Item 3, 10% of Item 4, 100% of Item 5 (approximations from DANE).

g/ DANE, Cuentas Nacionales, Cuadro 3, page 48.

h/ Using implicit price deflators for Gross Fixed Domestic Investment.

Source: DANE, Cuentas Nacionales de Colombia (Revision 3), 1970-1980, Cuadro 39 and worksheets from DANE.

Table 42 COLOMBIA: Functions and Characteristics of Agricultural Producer Organizations*

Commodity: Organization:	Coffee FEDERACAFE A	Rice FEDEARROZ B	Potato FEDEPAPA C	Seed ASOSEMILLA D	Cotton FENALCODON E	Cotton CONALGODON F	Sugarcane ASOCANA G	Palm Oil FEDEPALMA H	Flowers ASOCOLFLORES I	Cereals FENALCE** J	Livestock FEDEGAN K
Functions:											
1. Research	X 1/	X 2/	3/	X 4/	X	X	X 5/	6/	7/		3/
2. Extension/ Training	X 1/	X 2/		X 3/	X			X 4/	X	X 5/	
3. Credit	X 1/				X 2/	3/					
4. Production of Inputs		X									
5. Sale of Inputs	X 1/	X 2/	X 3/	X				X 2/			
6. Marketing of Products	X 1/	2/		X 3/	X 4/	X	5/	6/	X 7/	8/	
7. Agroindustry & Processing	X 1/				X 2/						
8. Provision of Infrastructure	X 1/										
9. Lobbying	X 1/					X			X	X 2/	
Characteristics:											
10. Year Established	1927	1948	1976	1969			1980	1962	1972	1960	1963
11. Membership - Actual	almost 100%	almost 100%	6,000	24 seed producers	12 Committees (rep. 3,000 growers)	22 member Federations w/30-900 members each	All 13 factories, plus over 50% of producers	85 companies	120 producers and exporters	4,300	
- Potential	300,000	n.a.	90,000	44	n.a.	n.a.	n.a.	100	145	20,000	n.a.
12. Persons Employed - Total, of which:	3,809	n.a.	24	5	300	n.a.	30	6	17	37	25
- Technical/ Professional	2,804	52	4	1	25	n.a.	n.a.	4	6	21	5
13. Number of Centers/ Branches	In all Depts. and Municipios in coffee zones	28	14		3						100 committees
14. Annual Operating Budget (Col$ M)											
- Total	8,600.0		300.0							43.0	
- Salaries & Administration	(approx. 40%)	260.0		6.0	200.0	12.0	35.0		0.5		
- Services (research, training, etc.)		60.0			50.0				1.5		
- Marketing		2,000.0 (seeds) 5,000.0 (other inputs)							16.0 (market promotions)		
15. Revenues: (i) Member's fees	-	Col$ 10/ ton ha	Col$ 100/ shr/year								
(ii) Others	Col$ 8,700/yr (from Coffee Fund)	$0.01/kg paddy milled (for research)		3% of value of seeds sold by members						$14/kg grain sold by members; tax on imports; 2/ Government grants	
16. Enabling Legislation		Law 101 (1963)								Law 51 (1966)	

X Indicates the functions performed by each organization.
* Other organizations not described here include FEDECACAO (Cocoa); AUGURA (Banana); ANALAC (Milk); etc.
** FENALCE represents 5 cereals: maize, sorghum, wheat, barley, avena.

Notes:

1. Research

1/ Done by subsidiary organization, CENICAFE (established 1938).
2/ Own research plus that contracted by ICA and CIAT.
3/ Relies on ICA research.
4/ Research done by 15 of the bigger members.
5/ Done by subsidiary organization, SENICANA (established 1977).
6/ Done by larger plantations.
7/ Research done by the Association (Col$1.5 million/year) is about 5% of total research effort of members (Col$ 30 million/year).

2. Extension/Training

1/ Provided for coffee as well as diversification crops.
2/ Train producers in accounting, business management, production techniques; organizes seminars, publications; also provides instructors to SENA. Receives technical assistance from HUNAT (under WB loan).
3/ Farmers' days for each major product in each locality; total 200 farmers' days/year. Presents TV, radio, news programs; 3-4 courses p.a. of 1-3 week duration on seed production technology.
4/ Organizes 4 field days/year when smaller farmers visit bigger plantations; 15 day courses in Colombia; and sends up to 12 people per year for courses in Costa Rica, sponsored by the Andean Group.
5/ Organizes competitions and field days.

3. Credit

1/ Mainly extended through Banco Cafetero and partly through Caja Agraria.
2/ Input loans in kind to members up to Col$ 15,000/ha at 30-36% p.a., supplementing FFAP loans of Col$ 35,000/ha (estimated production costs Col$ 85,000/ha. Total Col$ 255 million given in credit to members in 1982.
3/ Local member federations give credit to their members.

5. Sale of Inputs

1/ Imports in bulk (mainly fertilizer) and sells through local-level cooperatives.
2/ Supplies 50% of total needs.
3/ Sold through 13 stores.

6. Marketing of Products

1/ Domestic and external marketing of coffee; as well as diversification crops and animal products.
2/ Assists IDEMA with information on domestic and international markets.
3/ Exports seeds.
4/ Sells 70% of members' production.
5/ Maintains buffer stocks, supplementing IDEMA's role of price stabilization.
6/ Assists members with price information.
7/ Sale of cut flowers: US$125 million in 1982, 80% to USA, 20% to Europe.
8/ Had 22 trading centers, all closed down by 1975 due to lack of funds to buy up the crop, and lack of facilities to dry and store properly.

7. Agro-industry and Processing

1/ Includes feed mixing, milk processing, and packaging of fruit, vegetables, meat products.
2/ 12 ginning factories.

8. Infrastructure

1/ Includes roads, schools, hospitals, produce collecting centers, power lines, supermarkets, etc.

9. Lobbying

1/ Negotiates on behalf of Colombia at International Coffee Organization meetings.
2/ Meets with IDEMA before harvest time, to present their costs for the season and negotiate better support prices for producers.

10. Revenues

1/ FEDEPALMA membership fees = Col$ 50/ha (new members), plus
250/ha/year (new plantation), or
500/ha/year (in production)
2/ FENALCE annual revenues = Col$ 10 million from 1 cent/kg of grain sold by members.
25 million from tax on wheat imports
3 million from tax on maize imports
5 million from MOA, for providing training.

Table 43 COLOMBIA: PRODUCTION OF PRINCIPAL CROPS, 1970-82
(000 metric tons)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	Least Square Growth Rate 1970-82
CEREALS														
Rice (paddy)	702.2	851.9	997.5	1,151.1	1,540.4	1,614.0	1,560.0	1,307.0	1,714.7	1,932.5	1,797.9	1,798.7	2,018.3	8.0
Barley	87.1	107.2	98.0	81.5	96.9	121.8	71.4	81.3	118.9	136.6	109.5	56.4	55.6	-2.0
Wheat	53.7	53.2	69.2	72.4	58.8	38.9	45.3	38.5	37.7	42.0	45.7	62.3	70.7	-3.0
Corn	876.8	818.5	806.2	739.1	791.5	722.6	883.7	752.8	862.2	870.2	853.6	880.0	898.5	1.0
Sorghum	118.0	239.6	210.0	280.2	336.6	335.0	427.7	406.2	516.7	501.3	430.5	532.0	575.5	12.0
OTHER FOODCROPS														
Yuca	1,956.0	1,990.4	2,010.4	1,998.4	2,125.9	2,021.1	1,845.7	1,972.6	2,044.1	1,908.9	2,150.4	2,150.1	2,000.0	0.3
Potatoes	961.9	868.9	823.4	1,030.5	1,012.0	1,320.0	1,515.8	1,608.5	1,995.6	1,966.1	1,726.7	2,006.1	2,149.0	9.0
Platano	1,382.8	1,517.3	1,562.3	1,653.1	1,678.9	1,791.7	1,852.0	1,844.0	2,192.0	2,235.8	2,348.0	2,400.0	2,145.0	4.0
Panela	444.0	457.0	508.0	524.0	557.2	805.6	833.6	837.6	965.4	984.7	987.8	802.6	750.5	6.0
Beans (common)	38.8	35.6	61.1	56.9	67.1	89.9	67.6	74.9	74.8	74.7	83.6	79.3	72.9	5.0
Cacao	18.5	19.0	20.0	22.0	23.0	21.2	29.2	27.0	31.0	32.3	35.7	38.3	39.4	7.0
COFFEE	458.8	374.7	531.8	432.7	473.3	513.0	563.0	659.9	751.5	719.5	769.2	798.8	774.0	6.0
COTTON AND OILSEEDS														
Cotton	376.4	322.4	412.1	344.8	420.3	400.9	408.6	480.4	330.3	281.6	353.2	366.2	153.2	-3.0
Soybeans	131.9	100.7	104.6	97.2	114.0	168.9	75.1	102.9	130.8	143.6	154.5	89.0	98.8	1.0
Sesame	17.9	31.4	28.3	18.1	17.2	20.7	20.7	13.0	13.7	15.6	12.9	11.6	7.2	-8.0
African palm oil	26.9	36.2	41.4	44.0	50.8	39.2	38.6	48.1	52.6	59.6	70.0	79.9	85.2	8.0
OTHER EXPORT CROPS														
Sugar cane a/	575.2	744.0	823.7	809.9	894.8	969.7	934.6	853.3	1,025.9	1,096.0	1,188.6	1,148.1	1,254.6	5.0
Bananas a/	335.0	351.0	282.0	301.0	469.7	559.0	521.5	593.1	713.0	800.5	944.3	1,109.6	1,146.6	12.0
Tobacco	42.0	39.3	36.1	39.7	41.1	57.6	38.6	58.3	46.6	69.6	47.4	43.8	40.8	-2.0

a/ Refers to calendar year.

Source: Ministry of Agriculture (OPSA), ANDI for data on coffee and DNP.

Table 44 COLOMBIA: AREA UNDER CULTIVATION, PRINCIPAL CROPS, 1970-82
(000 hectares)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	least Squeare Growth Rate 1970-82
CEREALS														
Rice (paddy)	257.3	241.8	258.2	291.0	354.5	372.5	365.6	324.4	406.1	442.0	415.8	420.7	445.9	5.0
Barley	51.1	55.6	63.5	52.4	59.1	75.6	68.0	46.6	68.4	73.9	62.8	36.0	34.9	-2.0
Wheat	45.4	46.9	60.7	56.5	45.1	30.1	32.8	33.0	29.7	30.7	37.6	44.0	45.3	-2.0
Corn	661.4	666.5	624.5	580.3	570.1	572.7	647.5	580.5	670.9	615.6	614.4	629.0	636.0	0.0
Sorghum	53.6	92.1	84.0	135.4	151.2	134.0	173.6	189.5	224.8	221.2	206.0	231.3	298.1	11.0
OTHER FOOD CROPS														
Yuca	244.5	248.8	251.3	249.8	250.8	256.7	223.3	218.3	216.9	221.7	207.7	207.0	207.0	-2.0
Potatoes	88.6	88.3	89.5	98.6	92.0	110.0	125.0	130.0	141.6	148.0	142.0	159.5	165.2	6.0
Plantain	320.1	324.9	324.8	326.7	327.9	341.0	340.1	386.3	400.1	412.1	432.6	433.0	390.0	3.0
Panela	178.0	183.0	188.0	194.0	196.9	173.5	171.5	178.9	197.8	200.0	209.0	187.0	181.2	0.2
Beans (common)	66.0	68.0	84.6	87.0	90.7	120.7	101.0	115.8	110.9	112.4	115.4	117.3	112.2	5.0
Cacao	45.7	49.0	52.6	54.9	57.9	52.6	54.5	57.5	60.5	62.7	64.1	68.0	77.3	3.0
COFFEE	1,070.0	1,074.0	1,077.0	1,079.0	1,090.0	1,102.0	1,111.0	1,183.5	1,183.5	1,183.5	1,183.5	1,183.5	1,183.5	1.1
COTTON AND OILSEEDS														
Seed Cotton	266.6	219.0	242.3	250.8	258.4	280.7	285.6	377.2	327.9	186.5	216.9	221.1	99.2	-3.0
Soybeans	66.5	55.1	54.0	54.0	57.0	87.8	37.6	56.7	69.0	71.3	78.1	43.9	49.4	1.0
Sesame	27.4	47.0	43.2	37.0	32.2	41.6	36.1	23.7	24.9	27.7	24.2	19.4	12.3	-8.0
African Palm Oil	12.8	13.8	15.0	16.5	18.2	15.7	16.0	17.4	19.0	21.8	24.6	25.2	31.6	6.0
OTHER EXPORT CROPS														
Sugar Cane a/	69.0	64.0	72.9	78.6	75.1	75.7	83.0	76.5	86.5	91.1	93.2	92.1	92.9	3.0
Bananas a/	17.6	14.0	15.7	13.3	14.9	14.2	16.3	19.5	20.8	22.0	20.9	21.0	21.8	4.0
Tobacco a/	22.7	23.0	26.3	26.2	25.5	34.1	29.7	33.3	28.8	31.0	28.1	19.1	17.5	-1.0

a/ Refers to calendar year.

Source: Ministry of Agriculture (OPSA), Coffee Census, Economía Cafetera, and DNP.

Table 45 COLOMBIA: CROP YIELDS PER HECTARE, 1970-82
(metric tons/ha)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	Least Square Growth Rate 1970-82
CEREALS														
Rice (paddy)	2.7	3.5	3.9	4.0	4.3	4.3	4.3	4.0	4.2	4.4	4.3	4.2	4.5	3.0
Barley	1.7	1.9	1.5	1.6	1.6	1.6	1.1	1.7	1.7	1.8	1.8	1.6	1.6	0.0
Wheat	1.2	1.1	1.1	1.3	1.3	1.3	1.4	1.2	1.3	1.4	1.2	1.4	1.6	-1.0
Corn	1.3	1.2	1.3	1.3	1.4	1.3	1.4	1.3	1.3	1.4	1.4	1.4	1.4	1.0
Sorghum	2.2	2.6	2.5	2.1	2.2	2.5	2.5	2.1	2.3	2.3	2.1	2.3	1.9	1.0
OTHER FOODCROPS														
Yuca	8.0	8.0	8.0	8.0	8.5	7.9	8.3	9.0	9.4	8.6	10.4	10.4	9.7	2.3
Potatoes	10.9	9.8	9.2	10.5	11.0	12.0	12.1	12.4	14.1	13.3	12.2	13.2	13.0	3.0
Plantain	4.3	4.7	4.8	5.1	5.1	5.3	5.4	4.8	5.5	5.4	5.4	5.5	5.5	1.0
Panela	2.5	2.5	2.7	2.7	2.8	4.6	4.9	4.7	4.9	4.9	5.0	4.3	4.1	6.0
Beans (common)	0.58	0.59	0.62	0.61	0.64	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.6	2.0
Cacao	0.40	0.39	0.38	0.40	0.40	0.35	0.54	0.47	0.51	0.5	0.5	0.6	0.5	4.0
COFFEE	0.43	0.35	0.49	0.40	0.43	0.47	0.51	0.56	0.66	0.62	0.76	0.67	0.65	5.4
COTTON AND OILSEEDS														
Seed Cotton	1.4	1.5	1.7	1.3	1.6	1.4	1.4	1.3	1.0	1.5	1.6	1.7	1.5	0.0
Soybeans	2.0	1.8	1.9	1.8	2.0	1.9	1.0	1.8	1.9	2.0	2.0	2.0	2.0	0.0
Sesame	0.65	0.67	0.66	0.49	0.53	0.5	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.0
African palm oil	2.1	2.6	2.8	2.7	2.8	2.6	2.4	2.5	2.5	2.7	2.8	3.2	2.7	1.3
OTHER EXPORT CROPS														
Sugar Cane	9.7	11.6	11.3	10.3	11.9	12.8	11.3	11.2	11.9	12.0	12.8	12.5	13.5	2.0
Bananas	19.0	25.1	18.0	22.6	31.5	39.4	32.0	30.4	34.6	35.6	45.0	52.8	52.7	8.0
Tobacco	1.9	1.7	1.4	1.5	1.6	1.7	1.3	1.8	1.6	1.9	1.6	1.6	1.6	-1.0

Source: Ministry of Agriculture (OPSA)

Table 46 COLOMBIA: GROSS INTERNAL PRODUCT AND GROSS OUTPUT BY MAIN ECONOMIC ACTIVITIES, 1970-1981
(in million of current pesos)

Year	Internal Product						Gross Output				
	Agriculture (01+02+03)	"Pergamino" Coffee (01)	Processed Coffee (08)	Sugar (12)	Rest of the Economy	Total	Agriculture (01+02+03)	Processed Coffee (08)	Sugar (12)	Rest of the Economy	Total
1970	32,052	4,417	3,561	581	96,574	132,768	37,321	10,116	1,358	171,694	220,489
1971	35,396	3,919	3,584	615	116,291	155,886	41,677	9,850	1,594	208,863	261,984
1972	44,034	5,192	4,555	850	140,175	189,614	51,908	12,404	2,142	248,388	314,842
1973	56,460	6,690	7,761	982	177,957	243,160	67,638	17,354	2,532	313,716	401,240
1974	75,441	7,841	6,960	1,985	237,998	322,384	92,345	19,281	4,573	432,722	548,921
1975	93,164	8,971	12,816	2,510	296,618	405,108	113,991	26,629	5,949	537,773	684,342
1976	120,908	17,017	23,839	2,553	384,970	532,270	145,451	45,723	6,078	693,691	890,943
1977	172,900	30,898	33,831	4,485	504,813	716,029	202,674	64,530	8,803	900,252	1,176,259
1978	201,111	35,426	33,906	5,116	669,354	909,487	239,178	84,955	10,706	1,176,242	1,511,081
1979	244,477	41,098	33,399	7,647	903,294	1,188,817	294,841	96,222	14,599	1,570,314	1,975,976
1980	292,524	47,269	53,060	16,491	1,217,055	1,579,130	361,411	125,627	26,815	2,107,969	2,621,822
1981	367,092	57,489	44,039	16,768	1,560,120	1,988,019	452,292	112,216	28,875	2,707,970	3,301,353

Source: DANE, Cuentas Nacionales de Colombia (Revision 3): 1970-1980 (Bogota: Division de Edicion del DANE 1982), Tables 30 and 34, and unpublished information for 1981 and 1982.

Table 47 COLOMBIA: GROSS INTERNAL PRODUCT AND GROSS OUTPUT BY MAIN ECONOMIC ACTIVITIES, 1970-1981
(in million of 1975 pesos)

Year	Internal Product						Gross Output				
	Agriculture (01+02+03)	"Pergamino" Coffee (01)	Processed Coffee (08)	Sugar (12)	Rest of the Economy	Total	Agriculture (01+02+03)	Processed Coffee (08)	Sugar (12)	Rest of the Economy	Total
1970	75,338	8,370	10,062	1,088	221,008	307,496	91,119	20,850	3,824	400,178	515,971
1971	76,195	7,784	10,344	1,520	237,766	325,825	92,155	21,434	4,070	437,141	554,800
1972	81,565	8,595	10,468	1,739	257,041	350,813	98,650	21,691	4,566	464,142	589,049
1973	83,354	8,636	10,787	1,881	278,376	374,398	100,814	22,190	4,546	498,935	626,485
1974	87,918	8,793	11,020	2,006	294,966	395,910	108,250	22,911	5,009	536,693	672,863
1975	93,164	8,971	12,816	2,510	296,618	405,108	113,991	26,629	5,949	537,773	684,342
1976	95,839	9,386	10,830	2,136	315,458	424,263	116,801	23,552	5,074	567,940	713,367
1977	98,946	10,853	8,909	2,049	332,002	441,906	120,587	19,288	4,842	595,366	740,083
1978	107,088	11,852	14,193	2,343	355,711	479,335	130,157	30,728	5,583	639,547	806,015
1979	112,379	13,482	17,189	2,738	372,813	505,119	136,736	37,335	6,547	671,800	852,418
1980	114,849	13,945	17,565	3,085	390,266	525,765	140,256	38,140	7,458	703,254	889,108
1981	118,667	15,391	14,799	2,819	401,536	537,821	144,316	31,943	6,767	724,446	907,472

Source: DANE, Cuentas Nacionales de Colombia (Revision 3) 1970-1980 (Bogota: Division de Edicion del DANE, 1982); Tables 31 and 35, and unpublished information for 1981 and 1982.

Table 48 COLOMBIA: COMPOSITION OF GROSS OUTPUT IN BROAD AGRICULTURE
(in percentages)

Year	Pergamino Coffee	Other Agricultural Products	Animal Production	Processed Coffee	Sugar	Total
1970	9.7	33.1	31.8	18.0	3.3	95.9
1971	8.8	32.7	33.4	18.2	3.5	96.6
1972	9.2	34.2	32.7	17.4	3.6	97.1
1973	8.9	34.2	32.8	17.4	3.5	96.8
1974	8.8	34.2	33.5	16.8	3.6	96.9
1975	8.3	34.8	32.6	18.2	4.0	97.9
1976	8.6	35.8	33.7	16.2	3.4	97.7
1977	9.9	36.6	33.6	13.3	3.3	96.7
1978	9.6	34.7	31.4	18.5	3.3	97.5
1979	10.2	32.6	30.6	20.7	3.6	97.7
1980	10.3	32.4	30.8	20.5	4.0	98.0
1981	11.3	33.2	32.4	17.5	3.7	98.1

Note: The totals do not add up to 100.0 because the value of agricultural production includes some output produced by the agricultural sector which is not agricultural.

Source: DANE.

Table 49 COLOMBIA: GROSS VALUE OF OUTPUT OF ANIMAL PRODUCTION, 1970-1981
(in million of current pesos)

Year	Cattle (03.1)	Poultry (03.2)	Milk (03.3)	Others (03.4)	Total
1970	8,771	1,217	2,542	1,361	13,891
1971	10,778	1,810	2,949	1,323	16,860
1972	13,684	2,071	3,492	1,600	20,847
1973	19,704	3,353	3,928	1,843	28,828
1974	26,897	4,794	5,213	2,187	39,091
1975	32,063	6,193	6,261	3,419	47,936
1976	39,999	7,691	7,482	4,346	59,518
1977	52,088	11,500	8,617	6,574	78,779
1978	66,152	14,696	10,603	7,989	99,440
1979	82,712	17,826	13,784	10,381	124,703
1980	100,332	22,193	16,740	12,350	151,615
1981	126,332	28,435	23,286	15,622	193,675

Note: The numbers in parenthesis correspond to the national accounts code for each of those productions.

Source: DANE, Division de Cuentas Nacionales, unpublished information.