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POLICIES TO PROMOTE COLOMBIAN EXPORTS OF MANUFACTURES

By

~~Antonio Urdinola and Richard Mallon~~

The purpose of this paper is to analyze and evaluate the policies Colombia has applied over the last ten years to promote exports of manufactures. This ten-year period has been chosen because it was in the mid-1950's that international coffee prices collapsed and forced the country to accommodate its economy to a substantially lower level of foreign exchange income. During the following years it has become increasingly clear that coffee prices are not likely to recover their previous levels, that the probable long-term price trend will instead be downward, and that it is not possible to offset lower prices with larger export volume. It has also become increasingly apparent that future increases in foreign exchange revenue will have to come mainly from the expansion of other exports.

Before going on to analyze the policies adopted to promote non-coffee exports, however, it is first necessary to provide some background on the role of coffee in the structure of Colombian exports. Between 1946 and 1954 coffee prices rose four times as the postwar recovery in demand outstripped supplies, aided by the relatively low price elasticity of demand for coffee and the rather long gestation period between planting a new coffee tree and the time it enters into full production. At the height of the boom in 1954-56 Colombia was earning over 500 million dollars a year from coffee, which represented over 80% of its total export receipts.

As was to be expected, the response of increased output to this price incentive was powerful though delayed. During the 1950's world coffee production

doubled while export demand increased by only about one-third, with the result that prices for Colombian coffee tumbled by 40% between 1956 and 1959. Further price declines have since been held to about 10% by the International Coffee Agreement, in spite of the fact that world exports amount to only about two-thirds of world exportable coffee production and stocks exceed one-year's total consumption.

Within this general picture Colombia's position is further weakened by being the main world exporter of high quality, higher priced mild coffee, because consumer demand has shifted towards soluble coffee in the manufacture of which robustas are preferred. Colombia will therefore be lucky if exchange revenue from coffee exports continues to fluctuate around 300 million dollars per year, the expected decline in price being offset by the 2.5% annual projected increase in volume.

Imports of goods, on the other hand, are projected to rise to at least 700 million dollars by 1970 ^{1/} if the economy is to grow at an annual rate of 5.5%, thereby permitting an improvement in per capita incomes of the order of 2% per year (the minimum target of the Alliance for Progress). It is expected that foreign capital will cover a substantial part of the import gap in the years immediately ahead, but by 1970 gross capital receipts will probably be largely offset by increased remittances of profits, interest and amortization payments, which by this year will be approaching 200 million dollars annually. ^{2/}

Most of the difference between coffee earnings and import requirements (at least

^{1/} This projection recently made in Planeacion is rather conservative in that it is lower than World Bank and other estimates and implies a significant reduction in the import coefficient.

^{2/} Payments for services not related to foreign capital are about balanced by receipts from non-monetary gold and other service exports.

300 million dollars a year by 1970) will therefore have to be covered by receipts from other exports.

A glance at Table 1 reveals the difficulty of attaining such a target. Considerable progress was made between 1954-56 and 1964-66 in expanding non-coffee exports, which increased their share of total exports from 18 to 33%. But a large part of these exports are of petroleum, at least 60% of the value of which is paid abroad to cover the foreign exchange cost of production and profits.^{3/} So the non-coffee export base still amounts to only 130-140 million dollars annually. It took ten years to reach this level by doubling the 1954-56 base; now it is necessary to more than double these exports again over the next four years.

Another important point revealed by Table 1 is that by 1964-66 raw materials, intermediate products and capital goods accounted for all but 7% of total imports. Since industrialization efforts appear concentrated mainly in sectors which are relatively import-intensive, imported capital goods still represent about 80% of fixed investment in machinery and equipment, and final consumer goods imports are very small, it will not be easy to accelerate the rate of growth without simultaneously increasing the import coefficient, at least over the medium term. This will be particularly true if exports incentives designed to offset the cost disadvantages of protected domestic industry, encourage exports with a relatively high import content. This point will be analyzed in greater detail below.

1. Export Incentives: Introduction

The basic incentive for promoting export diversification is an attractive exchange rate. Through a system of multiple exchange rates and more

^{3/} Net petroleum receipts, however, depend largely on the rate of new investment of the petroleum companies

TABLE 1

Structure of Colombia's Foreign Trade

| <u>Exports (fob)</u> | <u>Average 1954-56</u> | | <u>Average 1964-66</u> | |
|--|------------------------|--------------|------------------------|--------------|
| | <u>Millions</u> | | <u>Millions</u> | |
| | <u>US\$</u> | <u>%</u> | <u>US\$</u> | <u>%</u> |
| Coffee | 503.0 | 82.2 | 359.1 | 67.0 |
| Petroleum | 69.1 | 11.3 | 78.4 | 14.6 |
| Other non-manufactured | 33.7 | 5.5 | 53.4 | 10.0 |
| Manufactures | 6.1 ^{a/} | 1.0 | 45.1 | 8.4 |
| <u>Total</u> | 611.9 | 100.0 | 536.0 | 100.0 |
| | | | | |
| <u>Imports (cif)</u> | | | | |
| Consumer goods | 113.2 | 17.0 | 41.3 | 7.2 |
| Raw materials and inter- mediate products | 332.9 | 49.9 | 346.7 | 60.7 |
| Capital goods | 220.0 | 33.0 | 183.3 | 32.1 |
| <u>Total</u> | 666.1 | 100.0 | 571.3 | 100.0 |

^{a/} Figure for 1956

Source: National Statistical Office (DANE)

lately by means of a coffee export tax, the rate for non-coffee exports (excluding petroleum) has been maintained at least 25% above the coffee rate. Furthermore, tax concessions have been granted non-coffee, non-petroleum exporters which in effect have given them an even more favorable rate of exchange. In analyzing the response of exports to exchange incentives it is therefore necessary to adjust the nominal exchange rate so as to include the effect of differential taxes and exemptions. The adjusted series is called the effective exchange rate.

The importance of these adjustments is considerable in certain years. During the period 1957-61 a tax was levied on exports which took away two-thirds of the benefit of devaluation during these years and not surprisingly was accompanied by a decline in the exports of manufacture. Between 1961 and 1962, on the other hand, not only was this tax gradually removed but an income tax exemption was granted exporters, which together are estimated to have contributed almost 60% to the substantial increase in the effective rate of exchange during this period, with the result that manufactured exports expanded rapidly.

Aside from adjusting the nominal exchange rate for taxes and exemptions, it is also necessary in a country suffering from a fairly rapid rate of domestic inflation to take into account the rise in production costs of exporters. Assuming that international prices are relatively stable,^{4/} and that most manufacturers are able to compensate cost increases with higher prices in the domestic market, the attractiveness of exporting will depend upon the relation between

^{4/} This assumption is of course not entirely accurate, but we did not find it possible to estimate a price index for internationally traded manufactures (as distinct from domestic price indices in exporting countries). In any event, the rise in world prices of manufactures has probably been small relative to those in Colombia.

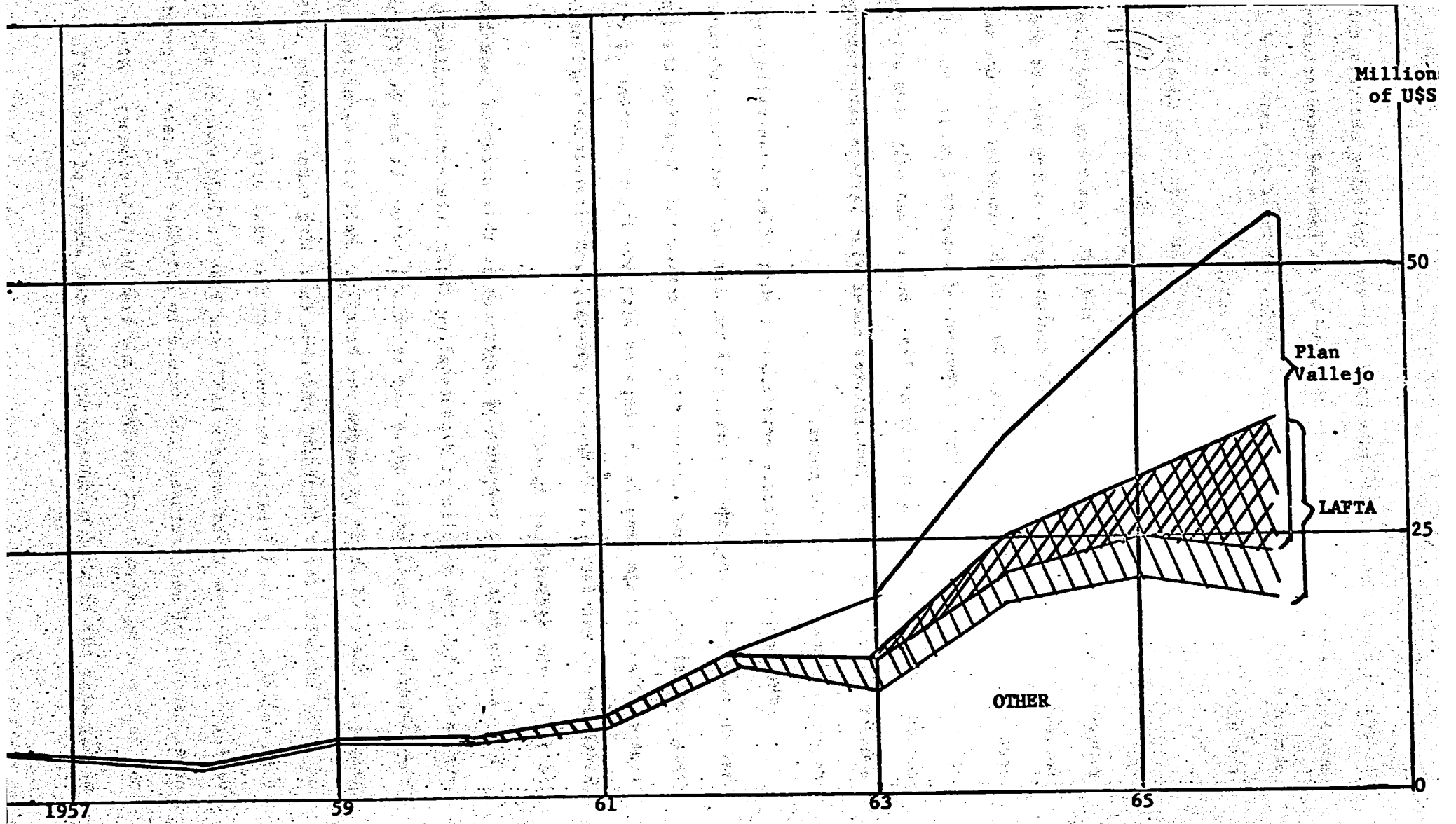
trends in costs and the exchange rate. In the following analysis the effective ~~exchange rate has therefore been deflated by an index of manufacturing costs to~~ obtain a real effective exchange rate index, which is the rate used in measuring the response of exporters to exchange incentives.

In addition to general exchange rate incentives, two special export promotion measures have been adopted in recent years. The first was the gradual reduction of import duties by members of the Latin American Free Trade Area. Between 1962 and 1966 the share of Colombian manufactured exports sold to these countries increased from 7.6 to 31%. The second incentive measure was Plan Vallejo, which exempted the import content of exports from payment of import duties. This Plan had existed since 1957, but it was only used after 1961 on a major scale. Exports of manufactures under Plan Vallejo have subsequently risen to almost 60% of the total.

The question therefore arises as to what effect Plan Vallejo may have had on increasing the import content of exports and therefore reducing net exchange earnings per dollar exported. To answer this question the import content of Plan Vallejo exports is compared with the import content of other exports and of manufacturing output in general, and alternative explanations are tested of the differences found.

In analyzing the response of exporters to this array of incentives we are faced with the problem of disentangling their inter-acting effects. Although the methodology employed is explained in detail below, it may be helpful to the reader if the road ahead is mapped out briefly. Multiple regression analysis of total exports, first including and then excluding exports under LAFTA and Plan Vallejo, is used first to determine whether real effective exchange rate variations and time trend explain LAFTA and Plan Vallejo exports as well as other exports of manufactures, and second to estimate the rate of growth of the latter independently of the LAFTA and Plan Vallejo schemes. After estimating with the help of a contingency table the amount of Plan Vallejo exports

CHART I
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which were independent of LAFTA, we are able to attribute (at least in terms of broad orders of magnitude) the amount of export growth due to each of the main incentive measures.

The value of additional net foreign exchange earnings attributable to each measure is then related to the fiscal cost of the corresponding tax exemptions or subsidies. The benefit-cost ratios of the various incentive measures are compared and an attempt is finally made to reach some policy conclusions. The reader is warned at the outset, however, that we make no pretense about the scientific precision of this analysis. Our purpose is to provide some quantitative guidelines for policy in an area where value judgments generally predominate. In the context the analysis and conclusions should be evaluated in terms of whether there are practical ways of improving them and whether they indicate the proper direction, nature and magnitude of policy actions.

2. Measurement of the Real Effective Exchange Rate for Exports

The effective export rate for manufactures was constructed by the addition of three elements: The nominal official "reintegro" rate (yearly averages of monthly rates), exchange taxes and the subsidy given in the form of an income tax exemption on export earnings. Table 2 summarizes the components.

The effective import rate for inputs of the manufacturing sector was estimated on the basis of the following elements, which are summarized in Table 3:

a) The nominal import rate: Since in many years it has varied from month to month and different rates have been applied to different types of goods, the estimate was made by dividing the total annual peso value of cif imports by the dollar value. In effect, this meant weighting each nominal rate by imports under it.

TABLE 2

Components of the Effective Export Rate

| <u>Year</u> | <u>Nominal "reintegro" rate, in pesos per dollar (yearly average)</u> | <u>Export tax %</u> | <u>Export subsidy %</u> | <u>Effective Export Rate</u> |
|-------------|---|-------------------------|-----------------------------|----------------------------------|
| 1956 | 4.95 | 0 | 0 | 4.95 |
| 1957 | 5.66 | 7.5 ^{a/} | 0 | 5.24 |
| 1958 | 6.41 | 15.0 | 0 | 5.45 |
| 1959 | 7.69 | 15.0 | 0 | 6.54 |
| 1960 | 6.92 | 15.0 | 0 | 5.38 |
| 1961 | 8.30 | 9.0 | 12 ^{b/} | 8.55 |
| 1962 | 9.10 | 0 | 12 | 10.19 |
| 1963 | 10.01 | 0 | 12 | 11.21 |
| 1964 | 10.42 | 0 | 12 | 11.67 |
| 1965 | 14.30 | 0 | 12 | 16.02 |
| 1966 | 13.50 | 0 | 12 | 15.12 |

a/ The 15% tax came into effect in June, 1957, through Decreto 107. It was reduced to 9% on December 31, 1960, and eliminated on December 31, 1961.

b/ 40% of export earnings was legally defined as net income for tax purposes and exempted from an average income tax of approximately 30%. If the tax exemption was larger than actual taxable income from exports, it was permissible to apply the balance as an offset to taxes payable on non-export income of the enterprise.

TABLE 3

Components of the Effective Import Rate
(Colombian pesos per dollar)

| <u>Year</u> | <u>Nominal average import rate</u> | <u>Average tariff duty</u> | <u>Import deposits(c)</u> | <u>"Timbre" tax</u> | <u>"giro" tax</u> | <u>Consular fees</u> | <u>Effective import rate</u> |
|-------------|------------------------------------|----------------------------|---------------------------|---------------------|-------------------|----------------------|------------------------------|
| 1956 | 2.50 | 0.40 | .023 | .225 | | .0250 | 3.17 |
| 1957 | 4.05 | 0.45 | .039 | .324 | | .0405 | 4.90 |
| 1958 | 6.35 | 0.57 | .129 | | .635 | .0635 | 7.75 |
| 1959 | 6.39 | 1.02(a) | .155 | | .320 | .0639 | 7.95 |
| 1960 | 6.63 | 1.33 | .202 | | | .0663 | 8.23 |
| 1961 | 6.70 | 1.27 | .188 | | | .0670 | 8.23 |
| 1962 | 6.86 | 1.23 | .230 | | | .0686 | 8.39 |
| 1963 | 9.00 | 1.44 | .298 | | | .0900 | 10.83 |
| 1964 | 9.00 | 1.44 | .310 | | | .0900 | 10.84 |
| 1965 | 9.80 | 1.86(b) | .453 | | | .0980 | 12.21 |
| 1966 | 12.84 | 2.43 | .366 | | | .1284 | 15.76 |

(a) Tariff changed in 1959 from specific to mixed ad valorem and specific taxes.

(b) Tariff changed in 1965 to all ad valorem duties.

(c) The average rate of interest of commercial banks is considered by the economic section of the Superintendency of Banks to have doubled from 7.5 to 15% during the period 1956-1966. A linear distribution was made for intermediate years.

- b) Import duties: The average impact was estimated by dividing yearly tariff income by the peso value of private imports cif. (Official imports do not pay import duties.)
- c) Import deposits: Each importer has to deposit in the Central Bank a certain percentage of the value of his desired import, prior to filing an import license application. The size of these deposits has varied greatly over time and by type of good, but research disclosed that throughout the period studied a three-month average lag existed between the date of deposit and the arrival of the merchandise, and a similar lag was found between arrival and the return of the deposit to the importer. Since import figures used correspond to the date of arrival, the sum of the import deposits existing on March 31 and September 30 of each year gives a good approximation of the value of the deposit made for imports which have arrived in that year. This sum was then divided by the cif peso value of private imports. (Official imports do not require import deposits.) The cost to the importer was estimated by using the average yearly interest rate over a 6-month period on the estimated average deposit.
- d) Import licenses ("timbre") taxes: These taxes were levied in 1966 and 1967. Because the rates varied over time and by type of merchandise, an estimate of their impact was obtained by dividing yearly tax receipts by the peso cif value of private imports. Lack of information impeded using a lagged figure for tax collections.
- e) Foreign exchange sales ("giro") tax: Same problem as above, solved in the same way, for years 1958-59 when they were in existence.
- f) Consular fees: They have been constant at 1% of the fob value of imports.

The effective import rate is, however, only one of the components of the cost of production index needed to deflate the effective export rate so as to express it in real terms. The other two major components are the cost of labor

and of domestic inputs. The cost of labor is approximated by the annual average hourly wage in manufacturing as reported by DANE (National Statistical Office), the cost of domestic inputs by the wholesale price index (excluding foodstuffs).

The use of the wholesale price index makes it convenient to convert everything to indices for purposes of aggregation. Each component index is weighted by its respective average proportion of the value of total manufacturing output at factory prices, as reported in the DANE industrial samples. The weights came out to be 13.5% each for labor and imported inputs and 73.0% for domestic inputs and factor payments.

Since the weight for imported inputs given by the DANE samples values imports at factory price, it is necessary to adjust the effective import rate to include the cost of internal transportation, handling and domestic insurance. The vast majority of imported inputs for manufacturing are imported directly by the user, so that it is not necessary to add a markup for distributors. The adjustment factor needed to raise the effective import rate at port (see Table 3) to a factory price basis was therefore estimated at 13% of the cif value of imports. This is the rate given in the first column of Table 4, which presents the component and total weighted indices of the cost of manufacturing production.

Finally, the effective export rate index (from Table 2) has been divided by the index of the cost of manufacturing production (Table 4) to obtain the real effective export rate index for manufactures (Table 5)

TABLE 4

Index of the Cost of Manufacturing Production

| <u>Year</u> | <u>Pesos/US\$ Effective import rate converted to factory price basis</u> | <u>Index</u> | <u>Average hourly wage index</u> | <u>Wholesale price index (excl. foodstuffs)</u> | <u>Total Index (1960=100)</u> |
|-------------|--|--------------|--------------------------------------|---|-----------------------------------|
| 1956 | 3.50 | 100 | 100 | 100 | 53 |
| 1957 | 5.43 | 155 | 128 | 126 | 69 |
| 1958 | 8.58 | 244 | 145 | 154 | 88 |
| 1959 | 8.78 | 251 | 158 | 169 | 95 |
| 1960 | 9.09 | 260 | 182 | 176 | 100 |
| 1961 | 9.10 | 260 | 238 | 185 | 107 |
| 1962 | 9.28 | 265 | 274 | 194 | 114 |
| 1963 | 12.00 | 342 | 380 | 242 | 146 |
| 1964 | 12.01 | 342 | 433 | 263 | 158 |
| 1965 | 13.48 | 385 | 480 | 292 | 176 |
| 1966 | 17.43 | 497 | 549 | 346 | 210 |

TABLE 5

Real Effective Export Rate Index for Manufactures

| <u>Year</u> | <u>Export Rate Index (current prices)</u> | <u>Index of cost of manufacturing production</u> | <u>Real Effective Export Rate Index</u> |
|-------------|---|--|---|
| 1956 | 84 | 53 | 158 |
| 1957 | 89 | 69 | 129 |
| 1958 | 92 | 88 | 105 |
| 1959 | 111 | 95 | 117 |
| 1960 | 100 | 100 | 100 |
| 1961 | 145 | 107 | 136 |
| 1962 | 173 | 114 | 152 |
| 1963 | 190 | 146 | 130 |
| 1964 | 198 | 158 | 125 |
| 1965 | 272 | 176 | 155 |
| 1966 | 256 | 210 | 122 |

3. The Effect of Exchange Policy on Exports of Manufactures

The series used in the following analysis for exports of manufactures is based on a reclassification of Colombian statistics according to the standard U.N. two-digit categories. Thus a number of commodities classified as industrial in Colombian tariff nomenclature were excluded from manufactured exports because of their low value added in manufacture. The most important are raw sugar and petroleum other than refinery products exported by the Ecopetrol (Colombian Petroleum Corporation). Total manufactured exports by two-digit categories are given in Appendix Table I for the years 1956-66.

Many attempts were made to find a relationship between the index of the dollar value of manufactured exports and the index of the real effective export exchange rate estimated in the previous section. The "best" relationship was found for the equation:

$$\ln E_t = a + b \ln R_t + c \ln R_{t-1}$$

where E_t = total exports of manufactures in the year t ,

R_t = real effective exchange rate in year t , and

R_{t-1} = same rate in the previous year $t-1$.

The relationship obtained was:

$$E_t = -7.60 + 3.13 \ln R_t + 1.58 \ln R_{t-1} ; R^2 = .32$$

(0.01) (0.72) (0.59)

The low R^2 is not surprising, however, in view of the fact that Colombia's exports of manufactures increased eight and one half times between 1960 and 1966 while the real effective exchange index fluctuated between 100 and 155. This suggests that factors other than the exchange rate have played an even

more important role in the expansion of manufactured exports. One possible explanation is the very rapid rate of growth in world trade.

Total world trade has been growing at a rate of around 6% annually during the last ten years. The yearly average rate of growth of Colombian manufactured exports during the period 1961-1966, however, comes close to 45%. It does not therefore appear that the simple growth of world markets can take us very far in explaining the observed trend in Colombian exports. We thus turn our attention now to the Plan Vallejo and LAFTA programs as possible explanations of rapid export expansion.

As was observed in Section 1, two export promotion schemes began to have importance in 1962. The most important was the so-called Plan Vallejo, a re-export method which essentially consisted in exempting the import content of exports from payment of import duties, from constituting prior import deposits and from the ordinary procedures of obtaining import licenses. In order to enter Plan Vallejo, a firm must make a contract with the Ministry of Development which specifies the proposed exports and their import content, but not in any fixed quantities. The firm can then import simply by permission from the Ministry (later from the Superintendency of Foreign Trade) which is easier to obtain than a regular import license. When one considers that Colombia has enjoyed only a few months of free trade since 1956 and that regular access to imported inputs is thus a highly prized privilege, it is easy to understand why Plan Vallejo appears to have had such an important impact on exports.

Another advantage for exporters under Plan Vallejo is that it allows the importation of raw materials and intermediate goods even if they are on the prohibited list, with only the prerequisite of depositing a financial

guarantee. This is a powerful incentive indeed when domestic prices of such goods are in some cases more than twice their world market prices.

Exports and imports carried out through Plan Vallejo are given in Appendix Table II at the 2-digit level. In studying this table it should be kept in mind that the figures have been obtained directly from firms with Plan Vallejo contracts and that coverage is only 94% complete. Furthermore, there is no necessary relationship between imports and exports in a given year because of inventory problems for which it was impossible to make adjustments.

The second export promotion program that became important after 1962 was the LAFTA (Latin American Free Trade Area) agreement signed in Montevideo in 1960.^{5/} Only indirect evidence can be obtained regarding its effect on exports, however, because no special accounts are kept of exports to LAFTA partners (Argentina, Brazil, Chile, Peru, Mexico, Ecuador, Uruguay and Paraguay) indicating whether they belong to categories benefitting from tariff reductions under the agreement. All we have to go on, therefore, is the value of Colombian exports to LAFTA members, which are presented at the two-digit level of disaggregation in Appendix Table III.

One serious flaw of available statistics is that they do not indicate what proportion of Plan Vallejo exports went to LAFTA countries or vice-versa. There appears to be little relationship, however, between the proportion of exports of any specified group going through Plan Vallejo and the proportion sent to the LAFTA area at the two-digit level and for any given year.

^{5/} LAFTA concessions affecting Colombia, however, went into effect in the second half of 1962.

In 1966, for example, the R^2 between the two series of percentages was .15, which for 20 observations gives us considerable confidence that little significant correlation exists.

Given the assumption of independence between Plan Vallejo and LAFTA exports, it is possible to identify them separately through use of the following contingency table, set up for each two-digit group and for each year:

| | <u>Plan Vallejo</u> | <u>Non-Plan Vallejo</u> | <u>Total</u> |
|--------------|---------------------|-------------------------|--------------|
| <u>LAFTA</u> | a_{11} | a_{12} | a_{13} |
| <u>Other</u> | a_{21} | a_{22} | a_{23} |
| <u>Total</u> | a_{31} | a_{32} | 100% |

In this table the a_{ij} represent percentages, of which the marginal ones (a_{31} , a_{32} , a_{13} and a_{23}) are known. They indicate the proportion that Plan Vallejo exports represent in total group exports (a_{31}), that LAFTA exports represent in total group exports (a_{13}), etc. To find the inner four (a_{11} , a_{12} , a_{21} and a_{22}) it can be assumed that $a_{11} = (a_{31})(a_{13})$, $a_{22} = (a_{23})(a_{32})$, etc., if the assumption of independence is valid. Once the inner four percentages are found for each group in each year, they can be multiplied by the corresponding total exports and added over all groups to obtain the value of manufactured exports going through Plan Vallejo alone, through LAFTA alone, and through neither of them. (See Table 6.)

Observation of Table 6 indicates that fluctuations in the effective exchange rate may provide a very good explanation of deviations of exports from a trend. The experiment was therefore made of including a trend term in

TABLE 10

Comparison of Non-Plan Vallejo, Non-LAFTA Exports
with the Real Effective Export Rate

| | <u>Non-Plan Vallejo, Non-LAFTA Exports</u> | | <u>Real Effective Export Rate Index</u> |
|------|--|--------------|---|
| | <u>Millions of US\$</u> | <u>Index</u> | |
| 1956 | 6.0 | 105 | 158 |
| 1957 | 5.0 | 87 | 129 |
| 1958 | 4.0 | 71 | 105 |
| 1959 | 6.3 | 111 | 117 |
| 1960 | 5.7 | 100 | 100 |
| 1961 | 7.1 | 125 | 136 |
| 1962 | 12.8 | 224 | 152 |
| 1963 | 10.7 | 188 | 130 |
| 1964 | 18.3 | 322 | 125 |
| 1965 | 20.8 | 364 | 155 |
| 1966 | 18.5 | 324 | 122 |

the previous equation in place of the lagged exchange rate variable.^{6/} The new equation is:

$$\ln E_t = a + b \ln R_t + c \ln e$$

where e = natural log base (a constant) and c = the years 1956 = 1, 1957 = 2,, 1966 = 11.

The relationships obtained for the various categories of manufactured exports were:

- 1) Total exports = $0.46 + 0.55 \ln R_t + 0.30 \ln e$; $R^2 = 0.95$
(0.03) (0.05) (0.01)
- 2) Total--LAFTA = $0.16 + 0.73 \ln R_t + 0.26 \ln e$; $R^2 = 0.95$
(0.03) (0.05) (0.01)
- 3) Total--LAFTA-P.V. = $-0.19 + 0.95 \ln R_t + 0.17 \ln e$; $R^2 = 0.94$
(0.01) (0.02) (0.002)

Although the R^2 are similar for all three regressions and the coefficients all appear to be highly significant, the last relationship is clearly the most satisfactory as far as the exchange rate variable is concerned. In this equation the coefficient of the exchange variable (equivalent to an elasticity) approaches unity, whereas in the first two equations it is clear that more of the explanation is picked up by the trend term.^{7/} It therefore appears justified to conclude that Plan Vallejo and LAFTA have provided significant additional incentives for the expansion of exports. The question

^{6/} In our experiments the coefficient of the lagged exchange rate variable was in all cases the least significant, so in view of the limited number of observations it was decided to replace it by a trend term instead of adding another term to the equation.

^{7/} When exports excluding those under LAFTA and Plan Vallejo were tested with the earlier equation (with the lagged exchange rate variable instead of the trend term), the R^2 improved to 0.40, thereby confirming the above impression.

which now remains to be answered is whether the additional expansion obtained justifies the cost of the incentives.

4. Evaluation of Plan Vallejo

In this section we will attempt to estimate the amount of export subsidy provided by Plan Vallejo and appraise its effects on the composition of exports and on net foreign exchange earnings.

The calculation of the effective exchange rate paid for Plan Vallejo imports is straightforward. From the effective import rate estimated in Section 3, the cost of import duties, prior import deposits and other taxes not paid under Plan Vallejo must be deducted. The only difference between the nominal and the effective rate for the Plan is the cost of consular fees, plus the 13% over cif import value to raise the basis of valuation from port to factory price (see Table 7). The effective import rate at factory cost under Plan Vallejo is therefore about 14% lower on the average than for regular imports.

As might be expected, the cheaper cost of imports and the ease of obtaining licenses has tended to make Plan Vallejo exports more import-intensive than other exports and manufacturing in general. Two factors appear to be at work here: Plan Vallejo has facilitated exports of products which in Colombia are normally more import-intensive, and inputs which could have been purchased locally have instead been imported under the Plan. The following table of import coefficients was constructed using the average import coefficients for manufacturing production in general estimated by DANE for two-digit groups in 1964. These coefficients have been weighted by the composition of output,

TABLE 7

Effective Import Rate Under Plan Vallejo
(Colombian pesos per dollar)

| <u>Year</u> | (a) <u>Without</u> <u>Plan Vallejo</u> | (b) <u>With</u> <u>Plan Vallejo</u> | <u>b/a</u> |
|-------------|--|---|------------|
| 1960 | 9.09 | 7.56 | .83 |
| 1961 | 9.10 | 7.64 | .84 |
| 1962 | 9.28 | 7.82 | .83 |
| 1963 | 12.00 | 10.26 | .86 |
| 1964 | 12.01 | 10.26 | .85 |
| 1965 | 13.48 | 11.17 | .83 |
| 1966 | 17.43 | 14.64 | .84 |
| | | <u>Average</u> | <u>.84</u> |

total exports and Plan Vallejo exports respectively.

TABLE 8

Import Coefficients of Industry and Manufactured Exports

| | (Percent of value of output) | |
|----------------------------|----------------------------------|-------------------------------------|
| | <u>Direct Import Coefficient</u> | <u>Total Import Coefficient (a)</u> |
| Manufacturing in general | 11.0 | 14.2 |
| Total manufactured exports | <u>15.0</u> | <u>18.1</u> |
| P. V. exports | 16.0 | 19.7 |
| Other exports | 13.6 | 16.0 |

(a) The indirect import coefficient was estimated by using an input-output table constructed by A. Berry and inverted by R. Sleighton with the collaboration of the Rand Corporation (see Appendix Table IV).

These figures appear to demonstrate that Plan Vallejo exports tend to come from the more import-intensive industrial groups. Furthermore, the actual import-export ratio under the Plan is even higher: an average of 33.1% for the period 1964-66 and 27.8% in 1966. This either indicates that imports have been substituted for inputs normally purchased domestically or that within the two-digit industrial groups the individual commodities exported under Plan Vallejo are considerably more import-intensive than the group averages.^{8/} One possible way of elucidating this question is to examine whether there is evidence of systematic deviations between the import component of exports and the proportion exported under Plan Vallejo.

^{8/} Attention should again be drawn to the possibility mentioned earlier that a part of imports under Plan Vallejo may be going to build up inventories for future expansion of output and exports.

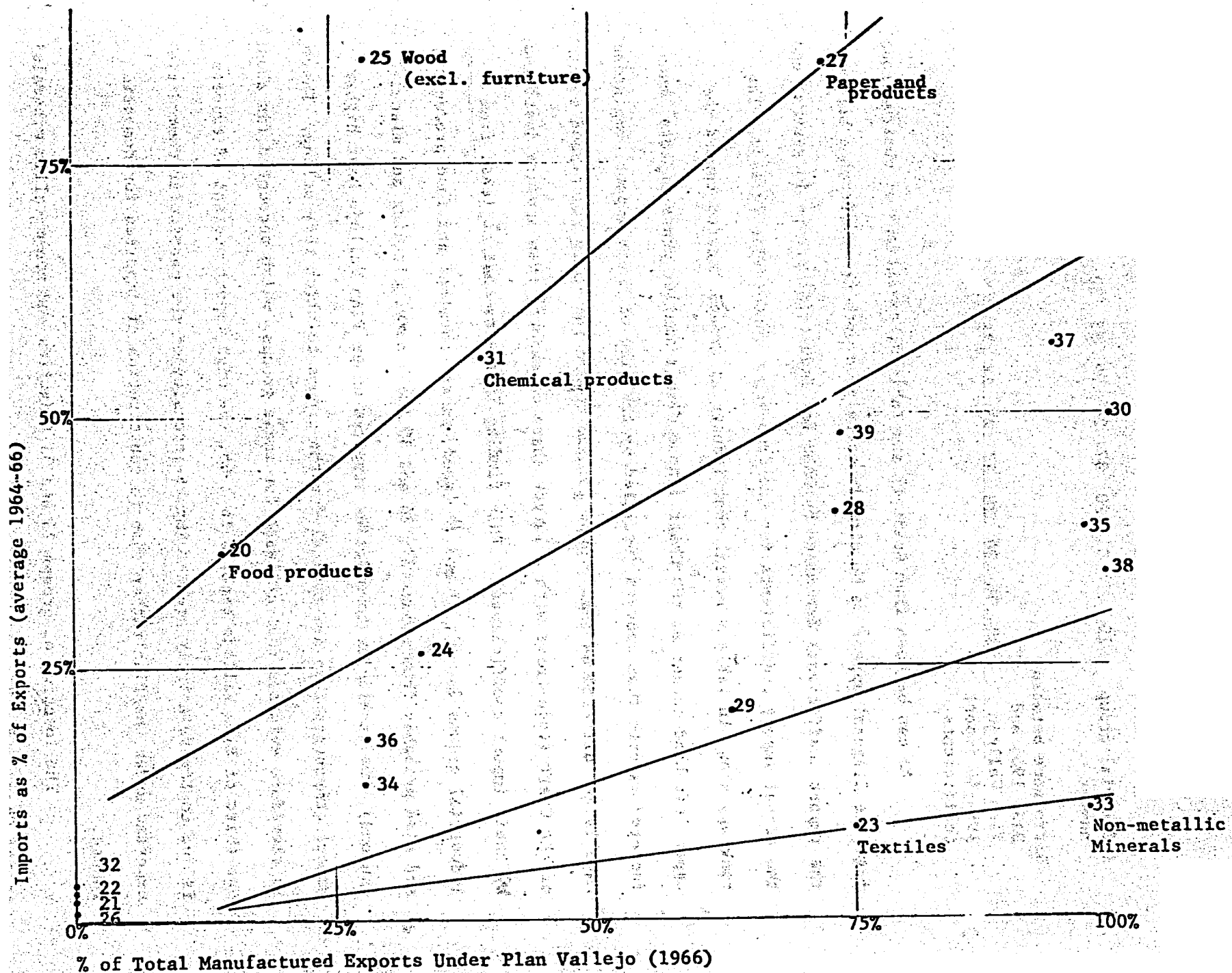
TABLE 9

| Industrial group number | 25 | 27 | 31 | 20 | 37 | 24 | 39 | 28 | 30 | 35 | 29 | 33 | 36 | 23 |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Difference between DANE 1964 and Plan Vallejo 1964-66 import coefficients | .80 | .70 | .30 | .28 | .27 | .25 | .23 | .28 | .18 | .16 | .13 | .04 | .01 | .01 |

As can be seen from Chart II and Table 9, deviations of observations from the diagonal appear to be closely correlated with the difference between the import coefficients estimated by DANE for industrial groups in general and the actual import coefficients for the same groups under Plan Vallejo. The rankings shown in Table 9 reveal that industrial groups located toward the upper left-hand corner of the Chart (those with a smaller share of total manufactured exports than appears justified by the size of their import components) have larger differences than groups located toward the lower right-hand corner of the Chart (industries with a larger share of exports than appears justified by their import coefficients). This finding indicates that at least from industrial groups 25, 27, 31 and 20 (wood, paper, chemical and food products), and also probably from groups 37, 24 and 39 (machinery, clothing and miscellaneous), the particular commodities exported under Plan Vallejo have higher import components than are typical for the groups to which they belong. There is therefore evidence that at least for these groups, which accounted for about one-third of Plan Vallejo exports in 1966, the high import content of exports is due to the relatively greater import-intensity of the particular commodities exported under the Plan rather than to substitution of imported for domestic inputs.

The location of groups 23 and 33 (textiles and non-metallic minerals) in the Chart and table also merit comment, since they account for an even

CHART II: EXPORTS UNDER PLAN VALLEJO



larger share of exports under the Plan. Textiles and cement were exported on an important scale before the Plan became important so that their later incorporation under the Plan probably had less to do with expansion of their foreign sales. Exporters may have decided to participate in the Vallejo scheme simply for greater assurance of being able to obtain their import requirements and because firms in these groups are in general well organized and therefore more alert in taking advantage of even marginal cost saving opportunities.

It is still probably true, however, that some imports under Plan Vallejo represent goods which could have been purchased domestically but at a higher price. The benefit to participants in the Plan is therefore greater than savings on import duties and taxes, particularly for imports of goods on the prohibited list and of those which have been more severely curtailed by import licensing.

If it is assumed that domestic prices of such goods are on average 50% above their cif equivalent, then the additional benefit would be 15% in terms of the effective exchange rate (as was seen in Table 3, import taxes and tariffs were estimated to add 35% to cif price), which added to the estimated 16% benefit from import duty and tax exemptions (see Table 7), gives a total subsidy of 31% on imported inputs.

5. Evaluation of Export Subsidy Policies

Two criteria are usually recommended for evaluating export subsidies a) comparison of the implicit exchange rate including subsidy with the shadow or accounting price of foreign exchange, and b) the fiscal cost of earning an extra dollar. Both methods are difficult to apply in practice, but the first is most difficult in the absence of a general equilibrium model. We shall therefore start with the second criteria.

It is first necessary to make clear, however, that we do not propose to compare the merits of a policy of export subsidy cum undervalued exchange rate against that of a more realistic rate without subsidy. The new exchange statute adopted in March 1967 has happily introduced greater flexibility into exchange policy, so that, if the rate of inflation continues to decline, the real exchange rate will over time move closer to a more realistic level. But existing exchange policy has been taken as an exogenous variable in our analysis.

The array of export promotion measures began to have an important effect in 1961 (as was seen above), so that in the following analysis we will concentrate on the period since 1960. To distinguish between the effect of different measures we will disaggregate exports by using the contingency table described on page 17. In doing so joint P.V.-LAFTA exports have been attributed to the latter.

The next step is to subtract from each category of exports an estimate of their import content to obtain net export earnings and calculate the gross fiscal cost of the corresponding subsidies. This is done in Table 10.

The problem now is to distinguish between the increments in exports presumably due to the subsidies and the growth which would have taken place anyway. By using equation $\ln E_t = a + b \ln R_t + c \ln e$ (see page 19), the effect of exchange rate variations (excluding the effect of introduction of the 12% export subsidy itself between 1960 and 1962) was removed from non-P.V., non-LAFTA exports and the new series plotted in Chart III. A clear break in the trend of these "other" exports can be seen beginning in 1961. If it is assumed that the trend prior to this year (about 7-8% per year) represents the increase in exports which would have occurred anyway, and that the difference between this rate and the trend after 1961 (about 20% - 8% = 12%) is due to

TABLE 10

Net Manufactured Exports and Gross Fiscal Cost of Subsidies
(Value of exports in millions of dollars, subsidies in millions of pesos)

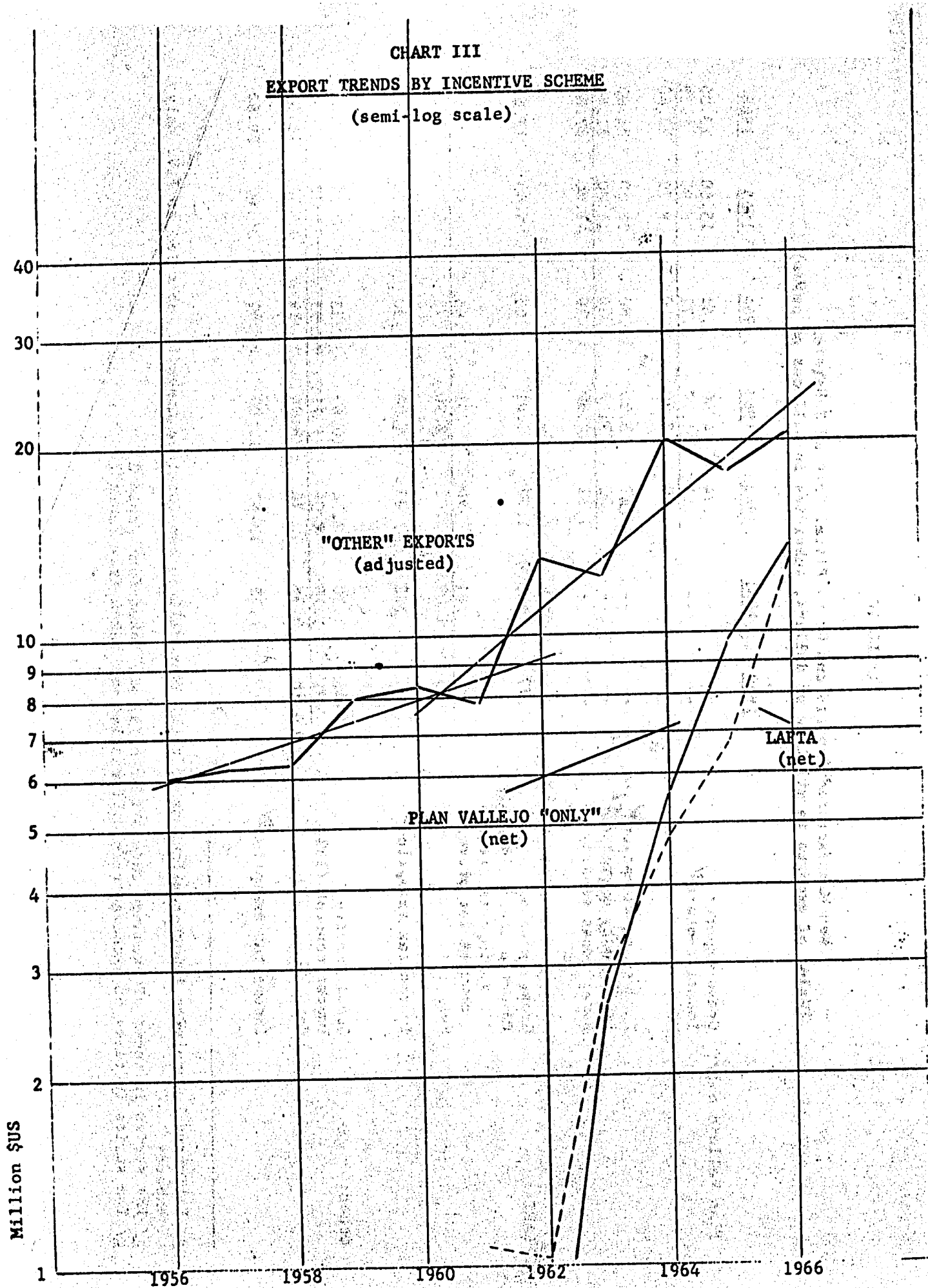
| | | <u>1960</u> | <u>1961</u> | <u>1962</u> | <u>1963</u> | <u>1964</u> | <u>1965</u> | <u>1966</u> |
|--------------------|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Plan Vallejo only: | Gross exports | -- | -- | .74 | 4.40 | 9.41 | 15.60 | 19.09 |
| | Import content ^{a/} | -- | -- | .14 | 1.70 | 3.71 | 5.90 | 5.29 |
| | Net | -- | -- | .60 | 2.70 | 5.70 | 9.70 | 13.80 |
| | Income tax exemption ^{b/} | -- | -- | .81 | 5.30 | 11.80 | 26.80 | 31.00 |
| | Import duty exemption ^{c/} | -- | -- | .20 | 3.20 | 7.30 | 14.80 | 21.80 |
| | Total gross subsidy | -- | -- | 1.01 | 8.50 | 19.10 | 41.60 | 52.80 |
| LAFTA: | Gross exports | .77 | 1.28 | 1.22 | 3.81 | 6.63 | 9.43 | 17.64 |
| | Import content (16%, plus P.V. imports not ac- counted for above) | .12 | .21 | .20 | .91 | 1.85 | 2.68 | 4.39 |
| | Net | .65 | 1.07 | 1.02 | 2.90 | 4.78 | 6.75 | 13.25 |
| | Income tax exemption ^{b/} | -- | .32 | 1.33 | 4.60 | 8.30 | 16.20 | 28.60 |
| Other: | Gross exports | 5.69 | 7.12 | 12.76 | 10.69 | 18.32 | 20.75 | 18.46 |
| | Import content (16%) | .91 | 1.14 | 2.04 | 1.71 | 2.93 | 3.32 | 2.96 |
| | Net | 4.78 | 5.98 | 10.72 | 8.98 | 15.39 | 17.43 | 15.50 |
| | Income tax exemption ^{b/} | -- | 1.78 | 13.80 | 12.80 | 22.80 | 35.60 | 29.80 |

a/ Estimated by applying import coefficient of total Plan Vallejo exports (see Appendix Table II) to P.V. only exports.

b/ The series in terms of exchange rate differential was taken from Table 2.

c/ The series in terms of exchange rate differential was taken from Table 7.

CHART III
EXPORT TRENDS BY INCENTIVE SCHEME
(semi-log scale)



the general export subsidy program, then it is possible to estimate the fiscal cost of additional export earnings due to the program. The results are as follows:

Table 11

Fiscal Cost of Additional Export Earnings ^{a/} (Millions of dollars for exports and pesos for subsidies)

| | <u>1962</u> | <u>1963</u> | <u>1964</u> | <u>1965</u> | <u>1966</u> |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|
| Total "other" Exports (+20%/yr.) | 10.20 | 12.24 | 14.69 | 17.68 | 21.16 |
| Less "normal" exports (+8%/yr.) | 9.18 | 9.91 | 10.70 | 11.56 | 12.48 |
| Exports due to subsidy | 1.02 | 2.33 | 3.99 | 6.07 | 8.68 |
| Exports net of import content (-16%) | .88 | 1.96 | 3.35 | 5.04 | 7.30 |
| Gross fiscal cost ^{b/} | 11.10 | 15.00 | 18.40 | 30.30 | 34.30 |
| Average cost per \$ earned | 12.6 | 7.7 | 5.5 | 6.0 | 4.7 |
| Marginal cost per \$ earned | - | 3.6 | 2.5 | 7.0 | 1.8 |

^{a/} Exports were assumed to be 8.5 million in 1961.

^{b/} Calculated in the same way as in Table 10 but on the basis of total exports shown in line 1.

It is interesting to observe that this gross fiscal cost of additional exports declined in all years except 1965 and that by 1966 the marginal cost was only 1.8 pesos per additional dollar earned.

In the same way the cost of obtaining additional exports from Plan Vallejo can be estimated. As can be seen in Chart 3 the rate of

increase in net P.V. exports has been diminishing over time, but at least in 1966 this may be due in part to the attribution of too large a share of joint P.V.-LAFTA exports to the latter. Nevertheless, if it is assumed that the general income tax exemption is responsible for a growth of 20% per year and that the import duty exemption is responsible for the difference, the results are as follows:

Table 12

Fiscal Cost of Net Plan Vallejo Exports
(Millions of dollars for exports and pesos for subsidies)

| | <u>1963</u> | <u>1964</u> | <u>1965</u> | <u>1966</u> |
|--|-------------|-------------|-------------|-------------|
| Net P.V. exports | 2.70 | 5.70 | 9.70 | 13.80 |
| Normal exports with general subsidy (+20%/yr.) <u>a/</u> | 2.70 | 3.24 | 3.89 | 4.67 |
| Exports due to P.V. | - | 2.46 | 5.81 | 9.13 |
| Gross fiscal cost (import duty exemption only) | - | 7.30 | 14.80 | 21.80 |
| Average cost per \$ earned | | 3.0 | 2.6 | 2.4 |
| Marginal cost per \$ earned | | - | 2.2 | 1.6 |

a/ The year 1963 was used as base to avoid the extremely low figure of 1962

Plan Vallejo looks very good indeed from a comparison to Tables 11 and 12, since both average and marginal costs of earning an extra dollar are lower under this Plan than under the general subsidy program in spite of this considerably higher import content of P.V. exports. Although one must keep in mind the margins of error involved in our assumptions, an important factor is undoubtedly the very powerful leverage effect which freedom from dependence

on local suppliers of inputs can represent. It is not only a question of price but of quality, of being able to meet international specifications for manufactured goods more easily, of not having to depend so much on unreliable delivery dates for domestic supplies, of being able to operate with smaller inventories of inputs because of the relative ease with which import licenses can be obtained. Nevertheless, the narrowing of the marginal gross fiscal cost of earning an additional dollar through Plan Vallejo and the general subsidy program in 1966 does raise an important question which requires further analysis.

Up to this point we have been measuring the gross fiscal cost of net additional export earnings. But increased export earnings also generate additional tax revenue, both directly and indirectly through the multiplier effect of greater import capacity on the general level of economic activity. Daniel Schydlosky has designed a method for measuring the total effect of increased foreign exchange income on tax receipts, under the strong assumption that foreign exchange is the only constraint on expanding GNP.^{9/} If this method is applied to Colombian parameters, additional tax revenue is estimated to amount to almost 50% of any increase in exchange earnings (see Appendix V). Although his strong assumption may be approximately correct for Argentina, where idle industrial capacity apparently exists on a large scale, its validity is more doubtful in Colombia. Nevertheless, even if total additional tax revenue amounted to half as much of the increase in exchange earnings, the average net general subsidy in 1966 would have amounted to only 1.3 pesos per dollar earned and the marginal net fiscal cost would have been negative.

^{9/} See his unpublished paper entitled "The Drawback as a Measure of Commercial Policy" and the paper he is submitting to this conference. Both of these papers deal with Argentina.

Since Plan Vallejo export earnings have a smaller multiplier effect on raising tax revenue because of the greater leakage due to their higher import content, the difference between gross and net fiscal cost of P.V. subsidies would be smaller. It is difficult to be precise but if it is assumed that the entire difference between the import component of P.V. and other manufactured exports ($30\% - 16\% = 14\%$) represents a diversion of demand from domestic to foreign suppliers of inputs, and that the incidence of taxes on the domestic value of output is of the order of 15%, then this direct leakage would amount to about 2% of the value of P.V. exports. If this figure were doubled to also take care of the indirect effect on tax revenue, the difference between gross and net fiscal cost of the P.V. subsidy should be approximately 0.6% smaller than for the general subsidy. It can be seen from Tables 11 and 12 that the actual estimated difference between marginal costs was less than this in 1966.

By using the same kind of projections contained in Tables 11 and 12, it is possible to estimate the minimum increase in P.V. exports which would be needed in 1967 to maintain a differential of 0.6% between the marginal cost of earning an additional dollar through the general subsidy and through Plan Vallejo. If it is assumed that the nominal average exchange rate in 1967 rises to 14.50 for both imports and exports and that the other parameters remain the same as in 1966, net P.V. exports would have to increase by almost 40% to maintain this cost differential, or by about twice the trend rate of "other" manufactured exports.

In reaching this conclusion we have purposely stacked the cards somewhat against Plan Vallejo, but since the rate of growth of "P.V. only" exports has apparently been declining and was estimated at only slightly

over 40% in 1966, it is worthwhile considering measures which could be taken to minimize the diversion of demand from domestic to imported inputs while retaining import flexibility. If the same tax exemption were given domestic producers selling inputs to Plan Vallejo exporters as is now given to exporters of manufactures, the difference between prices of foreign and domestic inputs would be narrowed. If operated in conjunction with existing Plan Vallejo regulations, such a policy would at least help to assure that the choice between imports and domestic supplies were based more on considerations of quality, specifications and timeliness of deliveries than on artificial price differentials.

With respect to the general export subsidy program, the main conclusions which appear warranted by the above analysis are, first, that the net fiscal cost of the existing subsidy (even after raising it to a flat 15%) is probably negligible or even perhaps negative. Second, if the gross subsidy per net additional dollar earned is added to the nominal export exchange rate, the resulting rate (in 1966, 18.2 if the average cost is included, 15.3 including the marginal cost), does not appear out of line with what might be considered an appropriate shadow price for foreign exchange. After all, if the real effective export rate had been maintained at the 1965 level, the nominal rate would have to have risen to about 17 pesos per dollar in 1966. If one further considers that domestic manufacturers receive on average at least 20% import duty protection (leaving aside the implicit protection provided by the import licensing system), then a rate of 20 pesos per dollar probably reflects more accurately the opportunity cost of foreign exchange in 1966.

It should not be forgotten either that we are dealing with a dynamic situation with rather complex interactions between variables. If the

gross fiscal subsidy were raised by an additional 2% of the value of exports, the rate of growth of these exports might accelerate further and again reduce the net incremental cost. Over the long term, of course, one would expect the foreign exchange constraint to become less severe if export promotion policy is successful, but in view of the projections given at the beginning of this paper, this is not likely to occur in the foreseeable future.

APPENDIX I
TOTAL COLOMBIAN EXPORTS OF MANUFACTURES
(in thousands)

| Commodity Group No. | 1956 ^{a/} | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | |
|--|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|
| Food products (excl. sugar) | 20 | 2,671 | 131 | 19 | 313 | 36 | 148 | 228 | 1,364 | 1,473 | 2,071 | 2,631 |
| Beverages | 21 | --- | --- | --- | --- | --- | --- | 22 | 81 | 20 | 9 | 10 |
| Tobacco | 22 | 12 | 14 | 17 | 44 | 22 | 21 | 19 | 43 | 34 | 34 | 25 |
| Textiles | 23 | 263 | 262 | 89 | 169 | 292 | 1,460 | 4,545 | 4,690 | 8,317 | 11,240 | 9,551 |
| Shoes and wearing apparel | 24 | 98 | 232 | 62 | 46 | 40 | 33 | 102 | 197 | 336 | 563 | 453 |
| Wood and cork (excl. furniture) | 25 | 66 | 61 | 12 | 30 | 51 | 207 | 187 | 713 | 688 | 728 | 549 |
| Furniture and accessories | 26 | 51 | 210 | 124 | 94 | 69 | 46 | 32 | 7 | 31 | 110 | 18 |
| Paper and products | 27 | 3 | 4 | 13 | 18 | 11 | 11 | 10 | 50 | 148 | 832 | 6,574 |
| Publishing | 28 | 3 | 20 | 14 | 32 | 22 | 83 | 269 | 336 | 602 | 790 | 660 |
| Leather and products (excl. footwear) | 29 | 953 | 949 | 925 | 869 | 319 | 618 | 1,693 | 1,921 | 3,366 | 3,545 | 3,380 |
| Rubber products | 30 | 19 | 13 | 12 | 3 | 15 | 24 | 23 | 53 | 1,161 | 2,458 | 4,303 |
| Chemical products | 31 | 422 | 784 | 1,032 | 1,026 | 1,285 | 1,415 | 2,824 | 2,489 | 5,430 | 10,203 | 9,649 |
| Petroleum and coal derivatives (Ecopetrol only) | 32 | --- | --- | --- | --- | --- | --- | 1,049 | 2,553 | 6,073 | 5,417 | 5,729 |
| Non-metallic minerals | 33 | 668 | 971 | 1,257 | 2,351 | 2,032 | 2,467 | 2,104 | 1,937 | 3,329 | 3,130 | 4,836 |
| Basis metals | 34 | 153 | 588 | 71 | 409 | 16 | 14 | 35 | 28 | 208 | 569 | 905 |
| Metal products (excl. machinery) | 35 | 164 | 218 | 145 | 197 | 215 | 222 | 267 | 253 | 640 | 1,470 | 1,667 |
| Non-electrical machinery | 36 | 454 | 560 | 317 | 872 | 1,780 | 1,238 | 934 | 1,162 | 1,409 | 1,414 | 2,058 |
| Electrical apparatus and machinery | 37 | 72 | 82 | 64 | 60 | 129 | 127 | 132 | 267 | 228 | 632 | 1,421 |
| Transport equipment | 38 | --- | --- | 6 | 12 | 9 | 4 | 30 | 68 | 101 | 68 | 165 |
| Miscellaneous | 39 | 92 | 131 | 113 | 125 | 121 | 268 | 213 | 400 | 756 | 598 | 610 |
| TOTALS | | 6,164 | 5,230 | 4,292 | 6,679 | 6,465 | 8,406 | 14,718 | 18,898 | 34,354 | 45,781 | 55,194 |

^{a/} Original figures, available only in pesos, were converted to dollars at the average exchange rate for the year of 4.95 per dollar.

APPENDIX II
EXPORTS OF MANUFACTURED PRODUCTS UNDER PLAN VALLEJO AND ASSOCIATED IMPORTS
(in thousands)

| | 1960 | | 1961 | | 1962 | | 1963 | | 1964 | | 1965 | | 1966 | |
|--|------------|-----------|------------|------------|------------|------------|--------------|--------------|--------------|---------------|--------------|---------------|--------------|---------------|
| | Imports | Exports | Imp. | Exp. | Imp. | Exp. | Imp. | Exp. | Imp. | Exp. | Imp. | Exp. | Imp. | Exp. |
| Food products (excl. sugar) | -- | -- | -- | -- | 4 | 20 | 107 | 14 | 173 | 278 | 51 | 187 | 73 | 363 |
| Beverages | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tobacco | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Textiles | -- | -- | -- | -- | -- | -- | 1,015 | 2,504 | 1,162 | 4,950 | 385 | 8,207 | 253 | 7,195 |
| Shoes and wearing apparel | -- | -- | -- | -- | -- | -- | -- | 38 | 23 | 91 | 56 | 183 | 33 | 150 |
| Wood and cork (excl. furniture) | -- | -- | -- | -- | -- | -- | 166 | 8 | 204 | 326 | 169 | 163 | 166 | 154 |
| Furniture and accessories | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Paper and products | -- | -- | -- | -- | -- | -- | -- | -- | 36 | 70 | 302 | 206 | 3,886 | 4,704 |
| Publishing | -- | -- | 15 | -- | 19 | 97 | 164 | 190 | 87 | 334 | 180 | 422 | 228 | 485 |
| Leather and products (excl. footwear) | 81 | 59 | 95 | 115 | 60 | 69 | 137 | 390 | 91 | 518 | 247 | 1,030 | 412 | 2,127 |
| Rubber products | -- | -- | -- | -- | -- | -- | -- | -- | 1,133 | 1,161 | 1,976 | 2,458 | 880 | 4,303 |
| Chemical products | -- | -- | 55 | 37 | 81 | 133 | 518 | 1,483 | 1,764 | 2,758 | 3,231 | 4,640 | 1,212 | 3,770 |
| Petroleum and coal derivatives (Ecopetrol only) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Non-metallic minerals | 20 | -- | 30 | -- | -- | 507 | 32 | 1,102 | 98 | 1,678 | 277 | 1,755 | 469 | 4,698 |
| Basic metals | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 38 | 27 | 253 |
| Non-electrical machinery | -- | -- | -- | -- | -- | -- | -- | -- | 24 | 190 | 73 | 290 | 90 | 578 |
| Electrical apparatus and machinery | -- | -- | -- | -- | -- | -- | -- | -- | 11 | 44 | 332 | 322 | 617 | 1,331 |
| Transport equipment | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 27 | 59 | 163 |
| Miscellaneous | -- | -- | 6 | 28 | 2 | 15 | 35 | 32 | 24 | 143 | 144 | 191 | 190 | 444 |
| Metal products (excl. machinery) | -- | -- | -- | -- | -- | -- | 49 | 32 | 234 | 412 | 546 | 1,015 | 381 | 1,616 |
| TOTALS | <u>101</u> | <u>59</u> | <u>201</u> | <u>180</u> | <u>166</u> | <u>841</u> | <u>2,223</u> | <u>5,793</u> | <u>5,065</u> | <u>12,953</u> | <u>7,970</u> | <u>21,134</u> | <u>8,976</u> | <u>32,334</u> |

APPENDIX III
EXPORTS OF MANUFACTURES TO LAFTA COUNTRIES^(a)
(in thousands)

| | 1956 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 |
|--|------------|------------|------------|------------|------------|--------------|--------------|--------------|--------------|--------------|---------------|
| 20. Food products (excl. sugar) | | | | | | 1 | 9 | 7 | 9 | 164 | 632 |
| 21. Beverages | | | | | | -- | -- | -- | -- | -- | -- |
| 22. Tobacco | | | | | | 2 | -- | -- | 14 | 18 | 7 |
| 23. Textiles | | | | | | 28 | 224 | 451 | 499 | 1,292 | 2,267 |
| 24. Shoes and wearing apparel | | | | | | 3 | -- | 38 | 5 | 13 | 19 |
| 25. Wood and cork (excl. furniture) | | | | | | 78 | 1 | 2 | 2 | 2 | 20 |
| 26. Furniture and accessories | | | | | | 9 | -- | 1 | 4 | 49 | 9 |
| 27. Paper and products | | | | | | 4 | 2 | 15 | 54 | 601 | 782 |
| 28. Publishing | | | | | | 28 | 119 | 187 | 152 | 374 | 360 |
| 29. Leather and products (excl. footwear) | | | | | | -- | -- | -- | -- | 9 | 35 |
| 30. Rubber products | | | | | | 17 | 10 | 39 | 1,122 | 2,266 | 4,070 |
| 31. Chemical products | | | | | | 585 | 450 | 1,523 | 2,916 | 2,791 | 2,017 |
| 32. Petroleum and coal derivatives (Ecopetrol only) | | | | | | -- | -- | 43 | 252 | -- | -- |
| 33. Non-metallic minerals | | | | | | 16 | 51 | 107 | 633 | 603 | 3,050 |
| 34. Basic metals | | | | | | 1 | 5 | 4 | 55 | 244 | 671 |
| 35. Metal products (excl. machinery) | | | | | | 41 | 61 | 97 | 209 | 453 | 693 |
| 36. Non-electrical machinery | | | | | | 259 | 89 | 101 | 213 | 274 | 1,269 |
| 37. Electrical apparatus and machinery | | | | | | 26 | 63 | 210 | 90 | 277 | 947 |
| 38. Transport equipment | | | | | | 2 | 22 | 67 | 73 | 4 | 46 |
| 39. Miscellaneous | | | | | | 3 | 10 | 55 | 124 | 72 | 136 |
| TOTALS | 192 | 273 | 244 | 346 | 672 | 1,103 | 1,117 | 2,947 | 6,423 | 9,545 | 17,033 |

a/ Original data for 1956-64 in pesos were converted at the following exchange rates: 1956 1957 1958 1959 1960 1961 1962 1963 1964
Original figures for 1965-66 were obtained directly in dollars. 4.95 5.66 6.41 7.69 6.92 8.30 9.10 10.01 10.42

Appendix Table IV

Estimate of Total Import Content in Manufacturing

| <u>Industry</u> | (1) | 1 9 6 4 | (2) |
|---------------------------|--|---------|--|
| | Direct Imports of Intermediate Goods as a % of Gross Output | | Proportion of Total Imports Embodied in Net Output |
| 20 Foodstuffs | .079 | | .098 |
| 21 Beverages | .026 | | .042 |
| 22 Tobacco | .029 | | .034 |
| 23 Textiles | .081 | | .116 |
| 24 Clothing | .010 | | .078 |
| 25 Wood | .036 | | .044 |
| 26 Furniture | .008 | | .043 |
| 27 Paper | .150 | | .203 |
| 28 Printing | .215 | | .226 |
| 29 Leather | .072 | | .096 |
| 30 Rubber | .322 | | .339 |
| 31 Chemicals | .254 | | .287 |
| 32 Oil and coal | .030 | | .032 |
| 33 Non-metallic minerals | .061 | | .085 |
| 34 Basic metals | .132 | | .262 |
| 35 Metal products | .224 | | .278 |
| 36 Non-electric machinery | .164 | | .203 |
| 37 Electric machinery | .297 | | .316 |
| 38 Transport equipment | .326 | | .357 |
| 39 Various industries | .246 | | .277 |

Column (1) is the ratio of consumption of imported intermediate goods to gross output by industry as reported by DANE. DANE estimates of consumption of imported intermediate goods refer to factory cost of such goods and hence include tariff and domestic transportation charges.

Column (2) differs from column (1) in that account is taken of the import content of intermediate goods purchased from domestic source. This estimate is based on an inter-industry flow table prepared for 1960 by Albert Berry of the Yale Growth Center. The matrix only reports commodity flows within manufacturing and is not an input-output table for the economy as a whole. The estimates of total import content are thus underestimated to the extent that manufacturing industries purchase intermediate products outside manufacturing that have a non-negligible import content. In notational terms the i th item of column (2) is $i \cdot 1 - A^{-1} m_1/x_1, \dots, m_{20}/x_{20}$

Where i is the Kronecker delta, A is a square matrix whose element a_{ij} is sales of the j th industry to the i th industry as a proportion of total sales of firms in the j th industry, and m_i and x_i are direct imports of intermediate goods and gross output of the i th industry respectively.

APPENDIX V

Estimate of Increased Tax Revenue Generated by Increase in Exports

(Based on methodology and calculations of Daniel Schydrowsky as applied to Colombian data for 1965)

1. $\frac{\text{Private expenditure}}{\text{GNP at market prices}} = p(1-t) = 0.895,$

where : p = propensity to spend of the private sector

t = tax rate including import duties

2. $\frac{\text{Market value of imports}}{\text{Private income after taxes}} = m = 0.154$

3. $\frac{\text{Import tariff revenue}}{\text{cif value of imports}} = a = 0.094$

4. $\frac{\text{Direct and indirect domestic taxes}}{\text{GNP at market prices}} = t^* = 0.100$

The relation between the increase in tax revenue (dT) which would arise from an increase in exports (dE) can be derived from the following equation:

$$\begin{aligned}dT &= \frac{t^*(1+a) + a.m}{(1+a) \left[\frac{1-p(1-t)(1-m)}{1+a} \right]} dE \\&= \frac{(0.100)(1.094) + (0.094)(0.154)}{(1.094) \left[\frac{1-(0.895) \left(1 - \frac{0.154}{(1.094)} \right)}{1.094} \right]} dE \\&= 0.490 dE\end{aligned}$$