

ECONOMIC GROWTH CENTER

YALE UNIVERSITY

Box 1987, Yale Station  
New Haven, Connecticut

CENTER DISCUSSION PAPER NO. 17

THE EXPORT SECTOR, STAGES OF ECONOMIC DEVELOPMENT,  
AND THE SAVING-INVESTMENT PROCESS IN LATIN AMERICA

by

Markos Mamalakis

December 15, 1966

Note: Center Discussion Papers are preliminary materials circulated to stimulate discussion and critical comment. References in publications to Discussion Papers should be cleared with the author to protect the tentative character of these papers.

## INTRODUCTION\*

The export sector affects investment by influencing the level and composition of aggregate demand, by being the source of a resource surplus convertible into investment, and by performing as a quasi-capital goods sector, i.e. making available to the economy indispensable but not internally produced capital goods.

Traditional trade theory and the Economic Commission for Latin America (ECLA) have analyzed trade as an engine of growth almost exclusively in terms of the first element. The presence of market opportunities outside the economy, and the ability of the export sector to pull the rest of the economy into growth through its feedbacks by exploiting these opportunities, define the externally-oriented stage of economic growth.<sup>1</sup> During this stage the economy is motivated by and gears its production apparatus toward exports. Growth enters its second stage and becomes internally-oriented whenever, due to a shift in market opportunities, production for the internal

---

\*The research on which the present essay is based was carried out in the summer months of 1966 in Santiago, Chile, during the author's tenure at the Institute of Economics, University of Chile, as a Ford Visiting Professor. A slightly different version was presented in September 1966, at the Torcuato Di Tella Institute's conference on the Foreign Sector and Strategy of Economic Development in Buenos Aires, Argentina. Useful comments on the earlier draft presented in Argentina were made by my colleagues, Professors Anisur Rahman, Richard Cooper, Vahid F. Nowshirvani, and Andrea Maneschi. The analysis and judgement expressed are nevertheless the sole responsibility of the author.

<sup>1</sup>The most refined and detailed presentation of the theory of stages of Latin American economic development stressing the relationship between exports and income growth that has been developed by the Economic Commission for Latin America is found in ECLA's 1965 publication The Process of Industrial Development in Latin America, 66. II. C.4. Volume I. Some writers have analyzed the historical development of specific countries in terms of this framework. See in particular Anibal Pinto S.C. Chile, Un Caso de Desarrollo Frustrado (Santiago de Chile: Editorial Universitaria, S.A. 1959).

market becomes the major objective and tool of growth,<sup>2</sup> if not also the only alternative.

Furthermore, as a result of its relatively high productivity, the export sector in most Latin American countries has been a major source of a resource surplus.<sup>3</sup> Whenever foreign capital participates in the export sector, part of the surplus generated leaves the country in the form of factor payments overseas.

In the present paper an attempt is made to analyze the relationship between the export sector, the savings-investment process, and stages of economic development in Latin America, by focusing attention on the role of the export sector as a quasi-capital goods sector. The two other functions are also considered, but only peripherally. Thus, the paper explicitly limits itself to one group of countries, those of Latin America, and to only one aspect of the economy, namely the interdependence between trade and the savings-investment process. Thus its scope is far less ambitious than that

---

<sup>2</sup>The ECLA writings reflect the disillusionment that prevailed after the Great Depression with respect to the capacity of the export sector to provide the continuous stimuli necessary for sustained economic growth. The theme that expansion or market opportunities emanating from trade between Latin America and developed nations are of limited or negative value for the Continent has been elaborated by Paul Prebisch, "Commercial Policy in Underdeveloped Countries," American Economic Review, May 1959.

<sup>3</sup>The export sector's role of providing an "investment surplus" has been the subject of extensive research by my colleague Javier Villanueva. The division of the export sector's resource surplus into national and foreign components and its growth implications have been analyzed, insofar as the Chilean economy is concerned, by Macciavello Varas, ECLA, Mario Vera, Clark Reynolds and the present author.

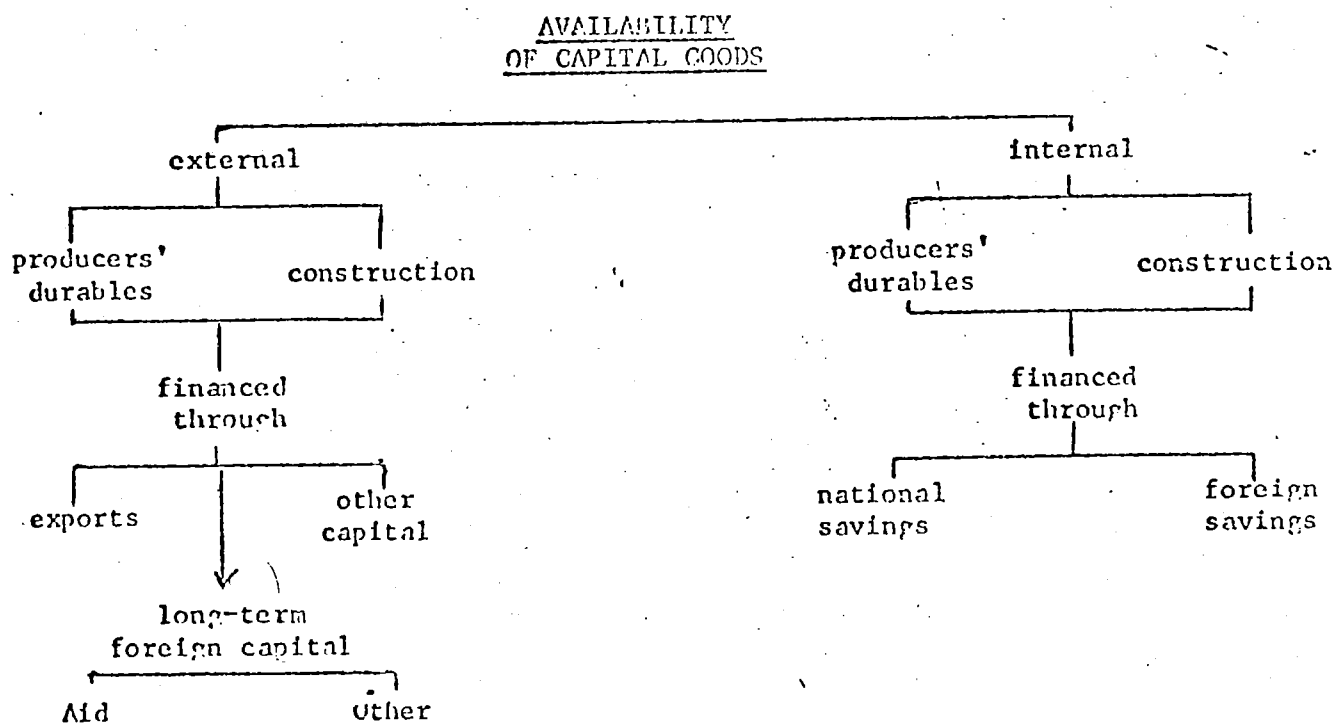
of the majority of models dealing with stages of economic development. The loss of generality, due to the paper's disaggregative and partial approach, is hopefully compensated by a gain in empirical validity.

Latin America can not be, and is not, considered as a unit, but as a set of economies. The theoretical analysis and empirical evidence that follow suggest the possibility of using the export-investment relationship to devise a typology of the Latin American economies with a corresponding set of policy recommendations.

The export sector assumes the role of a quasi-capital goods sector in economies where internal capital goods production is either totally or partially missing. In other words, if the capital goods needed are not internally available, the export sector performs the function of making them available from abroad.

The role of exports as a quasi-capital goods sector depends on a key "structural" characteristic, namely the relation between the total demand for capital goods and their availability.

The availability concept can be represented in a tree form as follows:



"The feasibility or availability concept measures the extent to which, at any given price of capital goods, the economy is able to satisfy all existing demand. Investment is not feasible or capital goods are not "available" if buyers are willing to buy them at existing international prices, but are unable to fulfill their plans because the economy as a whole does not earn enough foreign exchange or attract sufficient foreign aid or funds to pay for all domestically demanded or needed capital goods."<sup>4</sup>

---

<sup>4</sup>The importance of the capital goods availability constraint in a closed economy has been lucidly explained in G. A. Fel'dman's article "On the Theory of National Income Growth" published in 1928 in The Planned Economy (Planovoe Khoziaystvo). Fel'dman's work has been presented to the English-speaking audience by Evsey D. Domar in "A Soviet Model of Growth" published in Essays in the Theory of Economic Growth by Evsey D. Domar (New York: Oxford University Press, 1957) pp. 223-261. In Domar's words "Fel'dman's model contains an important element of truth: a closed economy without well-developed metal, machinery, and subsidiary industries (the complex of the so-called heavy industries) is unable to produce a sizeable quantity of capital goods and thus to invest a high fraction of its income, however high its potential saving propensity may be. In Soviet economic thinking the former consideration has been predominant; in our recent literature the ability to save has been emphasized. Perhaps a synthesis, or more correctly, a return to a synthesis, is in order." Ibid. p. 236.

The relevance of the capital goods availability constraint for under-developed countries, whether open or closed, has been pointed out and analyzed by Markos Hamalakis, "'Forced Saving' in Underdeveloped Countries. A Rediscovery or a Misapplication of a Concept?" Economia Internazionale, Vol. XVII, No. 3, September 1964. The quote in the text is from this article (pp. 25-26). Subsequently, and under the title 'the capital goods availability doctrine,' this concept has been refined and utilized to explain the low level of investment in Chile in Markos Hamalakis "Public Policy and Sectoral Development. A Case Study of Chile 1940-1958," pp. 1-200, published in Essays on the Chilean Economy by H. Hamalakis and C. Reynolds (Homewood, Illinois: Richard D. Irwin, Inc. 1965) especially pp. 35, 52, 76ff., 152ff. Unaware of Fel'dman's work until recently I first discussed the difference between the saving and capital goods constraints in my unpublished M.A. thesis "Inflation and Capital Accumulation in Greece: 1945-1955" Berkeley, California, 1959. It is worth pointing out that until recently, and with the aforementioned exceptions, the investment problems of less developed countries and of Latin America have been discussed almost exclusively in terms of the low ability and willingness to save. Ragnar Nurkse's and Nicholas Kaldor's writings are typical in this respect.

Footnote 4 continued on page 5.

The capital goods availability is actual or potential and internal or external. Internal potential capital goods availability is defined as the maximum short-term output, in a Marshallian sense, of the country's construction and machinery and equipment sectors. Total actual capital goods availability is measured ex post by the level of investment. Potential availability is measured by the maximum output of domestic capital goods sectors plus the level of exports (plus aid and net capital inflows) minus the expenditures for the country's needs for raw materials. Whenever an economy is not producing sufficient capital goods to satisfy all its needs,<sup>5</sup> we argue that the economy is running a capital goods deficit.

A gross capital goods deficit ( $D_C^I$ ) is defined as the positive difference between ex ante domestic savings and internal investment goods

---

Footnote 4 continued from page 4. We should add that related ideas have been discussed in planning theory and especially in the work by Hollis B. Chenery. Chenery subsumes the capital goods constraint under the foreign exchange constraint and import bottleneck. He has to be credited for analyzing in numerous articles the role of imports and foreign exchange for less developed nations and for describing the conditions under which the import constraint is binding. A selected bibliography of the relevant literature as well as a model contrasting the saving and import constraints is found in "Foreign Assistance and Economic Development" by Hollis B. Chenery and Alan M. Strout, The American Economic Review, September 1966, pp. 679-733.

The capital goods availability constraint, which is discussed in the present paper in substantial detail but without the use of an elaborate model, is a different concept from the foreign exchange constraint. It is relevant to countries that depend on capital goods imports for their capital formation. The foreign exchange constraint can be binding without the capital goods constraint having to be binding also. That is, even if the country can produce all the capital goods necessary to offset the flow of savings, (the capital goods constraint is not binding), its growth can be inhibited by the foreign exchange constraint.

<sup>5</sup>Capital goods needs are defined as the revealed total demand for domestic and imported capital goods at a given level of income and interest rates. The need for imported capital goods finds expression in requests for foreign exchange and permission to import capital goods to the country's authority that administers the allocation of foreign exchange.

availability.<sup>6</sup>

That is

$$(1) \quad D_G^I = s_a Y - v_d Y$$

where  $Y$  stands for income,  $s_a$  the ex ante propensity to save (average and marginal are equal), and  $v_d$  stands for the share of income stemming from the domestic production of capital goods.

Furthermore, a net capital goods deficit is defined as the positive difference between ex ante domestic savings and total actual capital goods availability, that is

$$(2) \quad D_G^I = s_a Y - v Y$$

where  $v$  stands for total actual availability as a share of income.<sup>7</sup>

In order to trace the role of the export sector in filling the gross and net capital goods deficits, we proceed to a formal presentation of a model describing these relationships.

<sup>6</sup> A gross capital goods surplus exists whenever  $v_n Y > s_a Y$

<sup>7</sup> Thus, the total amount of capital goods available ( $I_v$ ), is equal to the sum of internally produced ( $I_d$ ) and imported ones ( $I_I$ ). Furthermore,  $I_n$  is defined as  $I_d$  minus capital goods exports ( $E_I$ ). Accordingly, the following terms and definitions are obtained:  $v = \frac{I_v}{Y}$ ,  $v_d = \frac{I_d}{Y}$ ,

$$v_e = \frac{E_I}{Y}, \quad v_n = \frac{I_n}{Y}, \quad \mu = \frac{M_I}{Y} : \quad \text{Then, } v = v_d + \mu, \quad v_d = v_n + v_e, \text{ and}$$

$I = v_d Y + \mu Y - v_e Y = v_n Y + \mu Y$ . As will be pointed out in the following section,  $\mu = \frac{M_I}{Y} = \frac{E}{Y} \cdot \frac{M}{E} \cdot \frac{M_I}{M}$  where  $E$  stands for exports and  $M$  for imports.

The presence of a net capital goods gap means that  $s_a Y > v_d Y + \mu Y$ .

In part it would be reflected and could be measured by the size of requests for permission to import capital goods that are turned down by a country's authorities.

# 1. The Export as a Quasi-Capital Goods Sector. A Simple Model

As is well known, in the Harrod-Domar<sup>8</sup> growth model investment possesses a dual function. It raises the economy's productive capacity by an amount determined by the output-capital ratio, and its net increase raises aggregate demand through the multiplier. As Domar has shown, if the economy is originally in equilibrium, for this equilibrium between demand and supply to be sustained, investment must grow at a rate equal to  $s \alpha$ , where  $s$  is the propensity to save and  $\alpha$  is the output-capital ratio.

A fundamental assumption of the Harrod-Domar model from our point of view is the presence within the economy of both consumer and capital goods sectors.<sup>9</sup> It is our intention to relax this assumption and trace the implications of the partial or total absence of the capital goods sector from the economy. This is accomplished by introducing a simple income model where

$$(1) \quad Y = C + I + E - M$$

---

<sup>8</sup>The writings of Evsey D. Domar on growth have been collected in Essays in the Theory of Economic Growth, by Evsey D. Domar (New York: Oxford University Press, 1957). In particular see Essays N° I, III, IV, and V. The work by R. F. Harrod, appears in his "An Essay in Dynamic Theory," The Economic Journal, Vol. 49 (March 1939) pp. 14-33.

<sup>9</sup>R. I. McKinnon, in "Foreign Exchange Constraints in Economic Development and Efficient Aid Allocation," Economic Journal, June 1964, has carefully analyzed the importance of foreign exchange constraints on growth but mainly in terms of the capital-output ratio rather than the savings function, as done here.



The change involves substitution of the simple savings ratio by a new relationship which, under certain circumstances, is relevant to underdeveloped economies. It is assumed for this purpose that capital goods are not internally produced and that the economy's needs are totally satisfied through imports. As a result equation 2, the first term of which disappears, is reduced to the following

$$(2.1) \quad \frac{S}{Y} = \frac{M_I}{Y} \text{ and } \frac{M_I}{Y} = \mu$$

According to this equation, in equilibrium, saving cannot exceed the level of capital goods imported. This new ratio between imported capital goods and income (to be henceforth designated by the Greek letter  $\mu$ ) is the product of three other fundamental ratios, all of which are directly related to the export sector. The first is the ratio between exports and income, that is,

$$(4) \quad \frac{E}{Y} = \epsilon$$

The second is that between imports and exports,<sup>12</sup> namely

$$(5) \quad \frac{M}{E} = \omega$$

And, finally, the third is given by the share of imported capital goods in total imports, that is

$$(6) \quad \frac{M_I}{M} = \lambda$$

$$(2.2) \quad \frac{S}{Y} = \frac{M_I}{Y} = \frac{E}{Y} \cdot \frac{M}{E} \cdot \frac{M_I}{M} \text{ or } s = \mu = \epsilon\omega\lambda$$

<sup>12</sup>The omega ratio introduces a high degree of flexibility into the model since its value can equal, exceed, or fall short of one. If the value of  $\omega$  is greater than one, the economy experiences positive net capital inflows and "foreign saving". If the value of  $\omega$  is smaller than one, national saving exceeds domestic saving and the economy invests part of its resources overseas. The omega ratio can be decomposed to handle trade and balance of payment issues. As an example, imports (M) can be subdivided into those paid through exports ( $M_E$ ), those paid through long-term net capital inflows ( $M_L$ ), and those paid through short-term net capital inflows ( $M_S$ ). It would then be possible to rewrite equation 5 as follows:  $\omega = \frac{M}{E} = \frac{M_E}{E} + \frac{M_L}{E} + \frac{M_S}{E}$ , and take into consideration specific types of capital inflows.

If we substitute the saving ratio of equation 3 by the new "capital goods imports" ratio, this fundamental growth equation is transformed into the following one:

$$(3.1) \quad \frac{\Delta Y}{Y} = \frac{E}{Y} \cdot \frac{M}{E} \cdot \frac{I}{M} \cdot \frac{\Delta Y}{I} = \mu\alpha = \epsilon\omega\lambda\alpha$$

The rate growth of income is now determined by the interaction between a set of "trade ratios" and the output-capital ratio.

Simple variations in this equation reveal additional aspects of the growth process in countries where the capital goods sector is internally missing.

In the limiting case, where imports equal exports, all imports are in the form of capital goods, and investment is by assumption equal to exports, equation 3.1 is reduced to

$$(3.2) \quad \frac{\Delta Y}{Y} = \epsilon : 1 \cdot 1 \cdot \alpha = \epsilon \cdot \alpha$$

The rate of growth of income is equal to the product of the economy's "propensity to export"<sup>13</sup> and the output-capital ratio. If long-run equilibrium between demand and supply is to be maintained, exports<sup>14</sup> must grow at a rate

---

<sup>13</sup>The "propensity to export" expression is likely to be criticized by those who believe that exports are determined exogenously. For some Latin American countries, however, this term is useful both for descriptive and normative purposes. In a simple incomplete system, where no capital goods are internally produced and all exports are converted into capital goods imports, exports, being what the economy wants to invest, are determined by the difference between income and consumption. A propensity to save underpins the propensity to export and exports are determined by people's volition not to consume, i.e., to export. To a lesser degree, this argument is also valid for economies that import only part of their capital goods needs and face relatively favorable export markets. In a normative way, the term "propensity" indicates, under certain circumstances, what exports should be if ex post saving were to be raised to a level that comes close to ex ante saving. It can be added that use of the term "propensity" points out the fact that internal volition and governmental policies determine the export level, and, also, that the argument of exports being exogenous is more a reflection of our practice to treat them as such rather than that they are indeed exogenously determined.

<sup>14</sup>It is assumed that domestic and international relative prices are fixed. The assumption about constant foreign terms of trade could, however, be relaxed rather easily. This would make it possible to trace the relationship between the value of  $\epsilon$  and export price and quantity variations.

$\epsilon \cdot \alpha$ . The equilibrium rate of growth of exports is the equilibrium rate of growth of investment. The golden rule for income and investment growth is essentially a golden rule for export growth.

Saving is constrained, if not determined, by the external availability of capital goods. The export sector is per excellence a quasi-capital goods sector. The long-run equilibrium rate of income and investment growth has an even more precarious stability than in the original Harrod-Domar model in two respects. The rate at which investment grows is determined by conditions <sup>15</sup> partially outside the economy's control. Furthermore, any governmental policy directed against the export sector <sup>16</sup> is a policy against the capital goods sector and capital accumulation. Though this extreme case serves to dramatize the export sector's role in shaping the saving-investment process it is, fortunately, of limited applicability since practically all underdeveloped countries have internal capital goods production, even though mostly in construction rather than producers' durables.

A different case is obtained if the assumption that all imports are in the form of capital goods is relaxed while maintaining export-import

---

<sup>15</sup> Such conditions include foreign monetary, import, and tariff policies and also cyclical and secular changes in demand for primary products.

<sup>16</sup> Government discrimination against the export sector can be achieved through a deterioration in the export sector's terms of trade with other domestic sectors. Such discrimination need not involve a change in foreign terms of trade. Such discriminatory policies are often stimulated by the export sector's alleged failure to fill the gross capital goods gap through its function as a quasi-capital goods sector, and may or may not be associated with import substitution in capital goods production.

equality. Then, with  $\frac{M_I}{M} < 1$ , we obtain

$$(3.3) \quad \frac{\Delta Y}{Y} = \epsilon \cdot \lambda \cdot \alpha = \mu \cdot \alpha$$

Again, assuming that the values of  $\epsilon$ ,  $\lambda$ , and  $\alpha$  are fixed, the equilibrium rate of growth is the equilibrium rate of growth of exports.<sup>17</sup>

Finally, by permitting domestic capital goods production the model can be generalized and the following equation obtained.<sup>18</sup>

$$(7) \quad \frac{\Delta Y}{Y} = \left( \frac{I_n}{Y} + \frac{M_I}{Y} \right) : \frac{\Delta Y}{I} = \left( \frac{I_n}{Y} + \frac{E}{Y} \cdot \frac{M}{E} \cdot \frac{M_I}{M} \right) \frac{\Delta Y}{I}$$

The role of exports as a quasi-capital goods sectors diminishes as the value of the ratio  $M_I/I_n$  is reduced and a new extreme case is reached when the value of  $M_I$  drops to zero. The most important "export-investment patterns" are analyzed next.

## 2. Exports and the Saving-Investment Process in Various

### Stages of Economic Development

The size of the gross capital goods deficit in an economy determines the degree of influence which the export sector can exert upon the saving-investment process. If internal capital goods production is low relative to the ex ante level of saving, the need for an export sector to fill this gap is high. If, on the other hand, internal capital goods availability is high

<sup>17</sup>It may be pointed out here that the fixity of these relationships can be relaxed for underdeveloped countries rather easily within a slightly more ample model. Such an intent, nevertheless, falls outside the scope of the present paper. It is worth noting that in some Latin American countries protectionist import policies create a built-in rigidity of the  $\lambda$  ratio which can have detrimental effects upon growth.

<sup>18</sup>This model permits an excess of imports over exports (and vice versa) and can thus easily incorporate such elements as factor payments overseas, capital inflows and so forth.

relative to ex ante saving, the role of the export sector as a quasi-capital goods sector is bound to be of limited importance.

The degree of internal capital goods production depends on such factors as market size, the quality of labor and so forth. Since this paper focuses on only one "growth relationship," the magnitude of internal capital goods production is accepted as a datum, and discussion is confined to the role of trade within various patterns of cross capital goods deficits.

Up to this point we have referred to economies as having both capital and/or consumer sectors. We now select some shorter expressions which will also hopefully provide additional insights into the export-investment relationship. Stated simply, an economy possessing both consumer and capital goods sectors is called a complete economic system.<sup>19</sup> If the capital goods sector is missing it is called incomplete. More precisely, an economic system is defined as potentially complete if its market size, given a particular resource endowment, is sufficiently large to provide an adequately high profitability for the establishment of both consumer and capital goods industries. It is defined as actually complete if, given sufficient profitability, both consumer and capital goods sectors are established. More specifically, an economy is considered as a complete, or actually complete system, if it possesses both the sector that produces secondary<sup>20</sup> capital goods and the sector that produces primary<sup>21</sup> capital goods. A system is partially complete if it possesses only one capital goods subsector.

---

<sup>19</sup>The reader is referred to Chapter IV of the author's essay in Essays on the Chilean Economy, op. cit., pp. 149-168 for a more detailed explanation of some of these concepts.

<sup>20</sup>We call secondary capital goods those used to produce consumer goods.

<sup>21</sup>In contrast, we call primary capital goods those used to produce capital goods.

An economic system is defined as estimated incomplete if its market size is not sufficiently large to profitably support both consumer and capital goods sectors. Actually incomplete, or just incomplete, is an economy which does not possess the sector producing capital goods.

An economy is said to have reached completion<sup>22</sup> if there exists no gross capital goods deficit. If there exists a gross capital goods deficit, but not a net one, the economy is said to have achieved quasi-completion. Stated differently, quasi-completion is the state of affairs in which the export sector permits an equality between ex ante and ex post saving.<sup>23</sup>

The following section describes the most important patterns of the export-investment relationship considered relevant to the Latin American experience. These patterns can be called phases or stages of economic development, and can serve for cross-section and time-series analysis.<sup>24</sup> An

---

<sup>22</sup>In other words, an economy reaches completion if  $S_dY - v_dY$  is either zero or negative. It is possible for  $v_dY + \mu Y$  to exceed the actual level of gross domestic investment, the difference being equal to the country's capital goods exports ( $E_I$ ). If  $v_e = \frac{E_I}{Y}$ , then  $I = v_dY + \mu Y - v_eY$ , and  $\mu Y - v_eY$  gives us the net imports of capital goods.

<sup>23</sup>Our concern here is with domestic saving ( $S$ ) which by definition is identical to domestic investment ( $I$ ). Even after completion or quasi-completion is reached  $S_n$  can be greater than  $S$ , independent of any capital goods bottleneck considerations, and equality between ex ante and ex post national saving can be reached through the export surplus (net capital outflow) mechanism.

<sup>24</sup>The objective of this paper is to analyze some implications of relaxing the Harrod-Domar model's assumption that an economy is closed and/or possesses a capital goods sector, and more specifically a producers' durables sector. The introduction of the epsilon and omega ratios implies "opening up the economy", while introduction of the lambda ratio permits specific treatment of partial or total absence of domestic capital goods production and, therefore, of the capital goods bottleneck. Using the relationship between exports and imports of capital goods as a criterion, world economies can be imagined as falling into one of the following three categories. Those where capital goods exports ( $E_I$ ) exceed capital goods imports by a substantial margin ( $E_I > M_I$ ). These are complete systems with a capital goods surplus. Those countries where exports and imports of capital goods approximately offset each other ( $E_I \approx M_I$ ) which can be called complete systems with capital goods balance; and those where capital goods exports are negligible but imports substantial ( $E_I < M_I$ ). These are incomplete systems with a gross capital goods deficit. The notions of the "import gap" and "foreign exchange bottleneck" can be relevant and important to any country engaged in foreign trade. The capital goods gap and bottleneck are, however, notions relevant only to incomplete systems with a gross capital goods

economy, nevertheless, does not have to pass through all of them. Although sustained growth can be achieved only once (quasi-) completion has been reached, it should be mentioned that capital goods availability can be regarded only as a necessary but by no means a sufficient condition for the Rostowian take-off to sustained growth.

Case 1. Trade in a Complete, Technologically Primitive System. Exports play a limited role, insofar as the saving-investment process is concerned, during the first phase or stage of economic development. There exists no gross capital goods deficit since  $S \text{ ex ante} = S \text{ ex post}$ . Furthermore,  $\frac{M_I}{Y} = \epsilon \mu = 0$ , and  $\frac{S}{Y} = \frac{I_N}{Y}$ . Technology is primitive in the sense that agriculture, industry, mining, and so forth perform a dual role by producing both consumer and capital goods. Segregation in the functions of sectors in terms of producing consumer and capital goods is, at best, limited.

It can be argued, with a relatively high degree of plausibility (and some stretch of imagination), that the Latin American continent possessed these characteristics during the Colonial Period and Early Independence years. Capital formation was mainly of the social overhead type, such as irrigation works and construction related to the opening up of new areas, and also some artisan production of tools and instruments within industry, mining, and agriculture. At least in the case of Chile, trade (exports and imports) with other Latin American regions and Europe was mostly in luxury consumer goods, precious metals and some raw materials. What capital goods were needed were internally produced.

Cases 2 and 3. Trade in an Incomplete<sup>25</sup> or Partially Complete System. The

---

<sup>25</sup> If housing investment were considered as an expenditure on consumer durables, a substantial fraction of Latin American countries would closely fall into the incomplete system category during long time spans.

common characteristic of cases 2 and 3 is the presence of a gross capital goods deficit. In both instances, the export sector is entrusted with the role of making available the foreign capital goods necessary to equate ex ante with ex post savings. The export sector, in performing this role, assumes two "new" functions, as compared to case 1. It acts as a quasi-capital goods sector and creates a business climate which, by giving rise to a net capital inflow, permits imports to exceed exports. The two differ, nevertheless, in that in case 2 the deficit is successfully eliminated while in case 3 the export sector "fails" and a net capital goods deficit arises.

Case 2. This case <sup>26</sup> coincides with phase 2 in Figure 1. The export sector enables the economy to enter a state of quasi-completion.

Most of the large-and medium-sized Latin American countries moved out of the first and into the second phase, as a result of the transportation revolution and exposure to rising trade, sometimes after Independence and normally before the turn of the century. So did a few of the small countries. Some of the earlier types of capital formation, such as construction, continued, some artisan production of tools and instruments transformed itself into more sophisticated manufacturing,<sup>27</sup> while most economies became

---

<sup>26</sup>More specifically, in this instance  $S \text{ ex ante} = S \text{ ex post}$ , and

$$\frac{M_1}{Y} = \epsilon \omega \lambda > 0 \quad \text{and} \quad \epsilon > 0, \quad \omega > 1, \quad \text{and} \quad 1 > \lambda > 0$$

<sup>27</sup>The presence of a producers' durables sector in Chile has been demonstrated by J. Fred Rippey and Jack Pfeiffer, "Notes on the Dawn of Manufacturing in Chile," The Hispanic American Historical Review, XXVIII (May, 1948), pp. 292-302; and Jack B. Pfeiffer "Notes on the Heavy Equipment Industry in Chile, 1880-1910," The Hispanic American Historical Review, (February, 1952), pp. 139-144. According to Pfeiffer "Unlike a majority of her neighbors, Chile was one of the few Latin American nations which managed to make substantial progress in the development of industries other than those producing consumer goods considerably before the turn of the last century . . ." Ibid, p. 139.



increasingly dependent upon the then developed nations for imports of machinery and equipment.

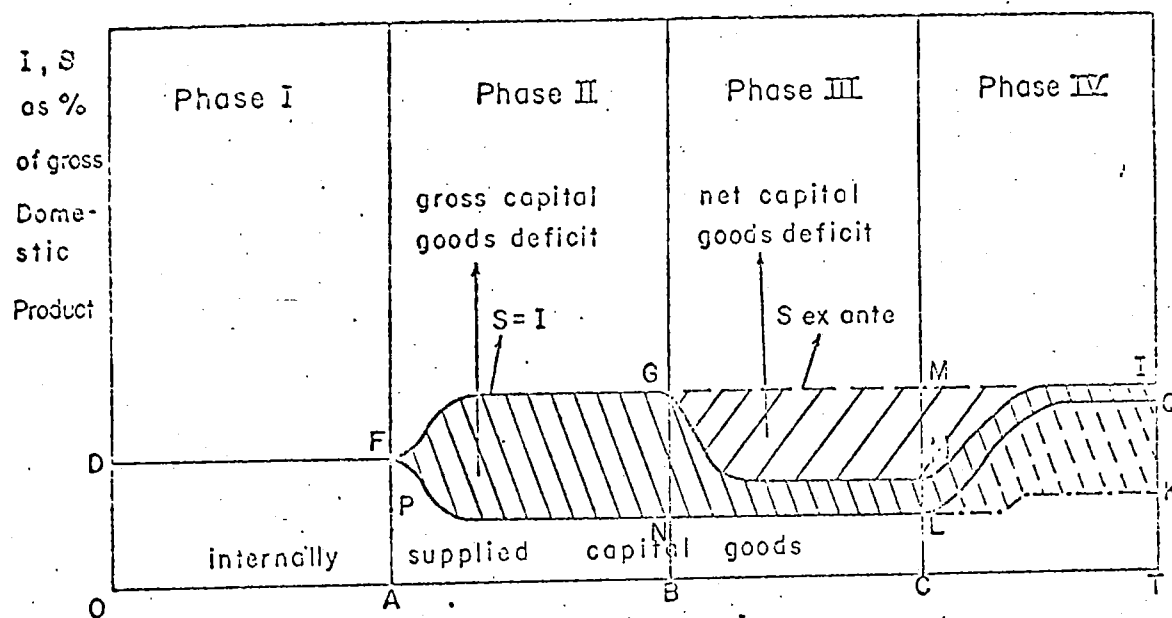


Figure 1

Both during the transition<sup>28</sup> period from a primitively complete to a partially complete system and during the whole second stage, a "desubstitution" of imports seems to have taken place for major components of capital goods production. Capital goods originally manufactured internally were subsequently imported either on quality grounds or because inflows of foreign capital were intimately linked with imports of foreign capital goods.<sup>29</sup>

The apogee of the second phase for the Latin American continent as a whole was reached during the 1920's.<sup>30</sup> Though any statement at this

<sup>28</sup>This pattern can be observed in Chile where apparently a flourishing machinery and equipment sector collapsed as government showed a strong preference towards imports.

<sup>29</sup>The transition from phase 1 to phase 2 is an event which has been analyzed very little and promises to be a fascinating field for research.

<sup>30</sup>Throughout this discussion, and especially insofar as Figure 1 is concerned, the term saving relates to the domestic one ( $S = I$ ) and not to  $S_x$  which may equal, exceed or fall short of the value of  $S$  depending on the value of the trade gap.

moment has a highly conjectural nature,<sup>31</sup> it appears that those Latin American countries that progressed during the 1840-1930 period moved into the second stage and reached quasi-completion,<sup>32</sup> sometime before the Great Depression.

Case 3. The danger and limitations inherent in a high degree of dependence of the saving-investment process upon the quasi-capital goods sector and of "trade overextension" are forcefully exposed during the third phase. For the first time there occurs a violent contraction in the investment level as export profitability and exports fall sharply, capital inflows dry up,<sup>33</sup> and external capital goods availability is reduced. Even with falling or reduced income and saving, a net capital goods deficit arises as ex ante saving exceeds total capital goods availability. The distance MH in Figure 1 measures the magnitude of the net capital goods deficit and also the reduction in the external capital goods availability. In this case  $S_{ex\ ante} > S_{ex\ post}$ ,<sup>34</sup>

---

<sup>31</sup>Most of the statistical evidence necessary to verify these hypotheses is not readily available, and, even if it were, it would fall outside the scope of this paper to present it mainly due to time and space limitations.

<sup>32</sup>During the 1920's, in Chile, the saving rate was around 25 per cent of the gross national product, exports 30 per cent, and capital goods imports approximately 10 per cent. The value of  $M_T$  rose from an almost zero level in mid-nineteenth century to its highest point in the late 1920's. Ex post saving also rose to this highly respectable level of 25 per cent of GDP.

<sup>33</sup>Net, and even gross, capital inflows normally come to a standstill when exports collapse since repayment prospects are linked to the behavior of the export sector.

<sup>34</sup>In standard analysis, if  $S_{ex\ ante}$  exceeds  $S_{ex\ post}$ , exports rise over imports and national saving exceeds domestic. In an underdeveloped country the process can be exactly the reverse. An exogenous export decline and an induced import reduction set an adjustment mechanism into motion. On the one hand, investors who previously imported capital goods are now unable to do so. As a result, they either invest in domestic capital goods, if these are available, or revise the plans to save, i.e., increase their consumption, or both. Potential savings which, because of the capital goods bottleneck, can not be converted into real savings are now consumed. What is argued here is that the volition to save is dependent upon capital goods availability. On the other hand, the export-import reduction leads to a decline in the total supply of available goods and services and, if aggregate demand is unchanged, to a price rise. Furthermore, if the composition of aggregate demand changes in favor of consumption, prices of consumer goods will rise unless there is an offsetting increase in their supply.

$\epsilon > 0$ ,  $\omega \geq 1$ , and  $i \geq \mu > 0$ . Inefficient government intervention can increase the net deficit by weakening the export sector, and especially if it leads to a control of the import composition to the detriment of the capital goods component.

In Latin America it was the Great Depression<sup>35</sup> of the 1930's that signalled the beginning of the third phase. The export sector collapsed and capital inflows dried up. The "failure" of the export sector to fill the gross deficit<sup>36</sup> was further accentuated by governments' often unconscious policy of discriminating against it, occasionally massive industrialization (import substitution) efforts, that raised capital goods needs, but only slowly, if at all encompassed production of machinery and equipment, and frequent controls of the import composition. Some Latin American countries are currently in this phase<sup>37</sup>; others have graduated to the fourth phase.

---

<sup>35</sup>The seriousness of the capital goods bottleneck was clearly illustrated during the post-Depression recovery, before, during, and after World War II.

<sup>36</sup>The evidence on the presence of a net capital goods gap is overwhelming. The desire but the inability to replace depreciated equipment is one of the strongest manifestations that the bottleneck is not on the saving but on the capital goods supply side. It is argued here that high depreciation allowances reflect the presence of saving while the inability to import and replace capital goods reflects a foreign exchange and capital goods shortage. In Chile, in thirteen years between 1940 and 1964 depreciation allowances exceeded gross domestic investment. This phenomenon, it is argued here, is more the result of an inability rather than an unwillingness to invest on the part of firms. In most of the remaining years depreciation allowances have been very close but below the value of gross domestic investment. In the Chilean case, a decumulation of capital appears to be an irrational policy for the majority of the enterprises.

<sup>37</sup>In Chile, saving ex post and capital goods imports fell by at least fifty per cent from their percentage values of the 1920's for the years up to date. The net capital goods deficit has fluctuated between 3-9 per cent of the gross domestic product. It is worth noting that import substitution raises capital goods needs and may require extensive import controls. These, however, can be viewed, if undertaken efficiently, as essential elements of the process of emancipation, in the longer run, from the foreign exchange or capital goods availability constraint.

Case 4. The Export Sector after Completion and Quasi-Completion.

Since the Great Depression, the majority of Latin American countries have attempted implicitly or explicitly, to reduce their net capital goods deficits. The small and medium-sized ones, where import substitution in producers' durables was too costly, had to rely anew on the export sector. Argentina, Brazil, and Mexico, which had become potentially complete systems during the second phase, entered dissimilar paths towards completion through import substitution policies in the production of machinery and equipment. The statistical evidence of the next section may shed some light with respect to the current state of relationship between the export sector and the Latin American countries for which statistical evidence is available.

In Figure 1, the line HI describes ex post S, and I, the line IQ domestic capital goods production in large Latin American countries, and LK similar production in small or medium scale economies. Thus, the gross capital goods deficit is measured by the distance IQ for large, and by the distance IK for the other economies. Though some large economies are likely to reach self-sufficiency, or even become net exporters of capital goods, this case is not shown in Figure 1. If this were to occur the point Q would coincide or pass point I.

Once countries have become actually complete systems, their problems, insofar as the saving-investment process is concerned, are fundamentally the same as those of "developed" nations. Since we are always searching for a strategy for sustained growth, I would argue that for complete systems the strategies are the same in spite of income differences.<sup>36</sup>

---

<sup>38</sup>After all, both the United States and Germany are developed nations and complete systems; and their per capita income difference during 1950 is not much smaller than the per capita income difference between Germany and Brazil. Thus, I would argue, that once Brazil becomes complete it will lose its underdeveloped character as regards the saving-investment process.

Though internal capital goods production is high during phase 2, and rises during phase 3 as compared to the two previous phases, the nature and quality of this production is radically different. While producers' durables during the first phase are of the artisan type and involve primitive technology, during the advanced fourth stage the producers' durables sectors (especially the primary ones) become a source of "endogenous" technological change and permanent technological dynamism.

### 3. Some Statistical Evidence

In the Table N° 1, which follows, are presented the values of the ratios  $\epsilon$ ,  $\omega$ ,  $\lambda$  and  $\mu$  for those Latin American countries for which statistical information is available. The time period covered includes the year 1960 and the period 1955-1963.

The objective of the present statistical section has been to provide a quantitative estimate of the actual external availability of capital goods. This actual (ex post) external availability is defined as being "high" if the value of  $\mu$  is greater than five per cent; it is defined as being "medium" if  $\mu$  ranges between one per cent and five per cent; and, finally, it is defined as "low" if the value of  $\mu$  is below one per cent. Since the number of years for which the statistical information, necessary to calculate  $\mu$ , was available, differed from country to country, the average values of  $\mu$  presented in the last column of Table 1 are not always strictly comparable.

The most important findings are the following. There exists no single country, among those for which the value of  $\mu$  could be calculated, that had a low external availability. The group with high external availability included such special cases as Panama, five out of eight countries having a value of  $\epsilon > twenty per cent$  (Venezuela, Peru, Costa Rica, Panama, and Cuba), and Mexico and Colombia which have relatively high values of  $\lambda$ . In this top

S U M M A R Y

EXPORTS AS A PERCENTAGE OF G.N.P.  
IMPORTS OF MACHINERY AND EQUIPMENT AS A PERCENTAGE OF TOTAL IMPORTS  
IMPORTS AS A PERCENTAGE OF EXPORTS  
AND IMPORTS OF MACHINERY AND EQUIPMENT AS PERCENTAGE OF G.N.P.

|                          | 1950 | 1955  | 1956  | 1957  | 1958  | 1959  | 1960  | 1961  | 1962  | 1963  | N° of :Aver-<br>years<br>ages |
|--------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------------|
| ARGENTINE                |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               |      | 5.4   | 10.8  | 9.6   | 8.4   | 11.8  | 10.4  | 7.9   |       |       | 7 9.18                        |
| 2 M <sub>I</sub> /M      | 21.8 | 17.9  | 22.8  | 21.6  | 22.1  | 22.1  | 34.8  | 35.6  | 47.4  | 42.0  | 10 28.80                      |
| 3 M/E                    | 84.2 | 126.2 | 119.4 | 134.4 | 124.0 | 98.4  | 115.7 | 74.3  | 111.5 | 71.9  | 10 106.00                     |
| 4 M <sub>I</sub> /P.N.B. |      | 1.2   | 2.9   | 2.8   | 2.3   | 1.6   | 4.2   | 2.1   |       |       | 7 2.43                        |
| BOLIVIA                  |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               |      |       |       |       |       |       |       |       |       |       |                               |
| 2 M <sub>I</sub> /M      | 16.0 | 26.3  | 34.6  | 30.1  | 31.4  | 30.3  | 30.9  | 22.9  | 21.4  | 20.6  | 10 26.40                      |
| 3 M/E                    | 68.1 | 82.5  | 78.7  | 124.9 | 158.8 | 110.1 | 139.3 | 133.9 | 165.8 | 157.9 | 10 122.00                     |
| 4 M <sub>I</sub> /P.N.B. |      |       |       |       |       |       |       |       |       |       |                               |
| BRAZIL                   |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               | 10.3 | 8.9   | 8.0   | 7.0   | 6.8   | 7.5   | 7.0   |       |       |       | 7 7.92                        |
| 2 M <sub>I</sub> /M      | 34.0 | 28.4  | 26.8  | 36.5  | 37.6  | 39.9  | 35.9  | 35.8  | 35.6  | 30.6  | 10 34.11                      |
| 3 M/E                    | 81.4 | 91.6  | 81.1  | 106.7 | 108.8 | 107.1 | 115.1 | 103.9 | 121.4 | 105.7 | 10 102.28                     |
| 4 M <sub>I</sub> /P.N.B. | 2.9  | 2.3   | 1.7   | 2.7   | 2.8   | 3.2   | 2.9   |       |       |       | 7 2.64                        |
| COLOMBIA                 |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               | 11.1 | 13.6  | 15.7  | 16.9  | 19.1  | 17.9  | 14.4  | 13.4  | 13.3  | 11.5  | 10 14.59                      |
| 2 M <sub>I</sub> /M      | 33.2 | 39.3  | 40.0  | 31.5  | 34.8  | 37.1  | 40.3  | 37.1  | 37.8  | 38.8  | 10 36.99                      |
| 3 M/E                    | 92.1 | 114.6 | 122.3 | 94.4  | 86.8  | 87.8  | 111.6 | 128.2 | 116.6 | 113.4 | 10 106.78                     |
| 4 M <sub>I</sub> /P.N.B. | 3.4  | 6.1   | 7.7   | 5.0   | 5.8   | 5.8   | 6.5   | 6.4   | 5.9   | 5.1   | 10 5.75                       |
| CHILE                    |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               | 10.9 | 9.4   | 11.6  | 12.3  | 10.0  | 13.0  | 11.8  | 10.4  | 10.1  | 11.6  | 10 11.11                      |
| 2 M <sub>I</sub> /M      | 27.0 | 28.5  | 36.3  | 41.6  | 39.1  | 33.1  | 36.8  | 39.6  | 39.7  | 33.8  | 10 35.55                      |
| 3 M/E                    | 87.3 | 79.2  | 64.9  | 96.3  | 106.6 | 83.1  | 101.9 | 116.2 | 96.1  | 102.8 | 10 93.44                      |
| 4 M <sub>I</sub> /P.N.B. | 2.6  | 2.1   | 2.7   | 4.9   | 4.2   | 3.6   | 4.4   | 4.8   | 3.9   | 4.0   | 10 3.71                       |
| ECUADOR                  |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               | 19.6 | 19.2  | 19.2  | 20.4  | 19.1  | 19.4  | 18.5  | 17.2  | 19.7  | 17.9  | 10 19.02                      |
| 2 M <sub>I</sub> /M      |      |       |       | 37.2  | 35.9  | 34.2  | 35.7  | 34.3  | 30.9  | 30.2  | 7 34.05                       |
| 3 M/E                    | 65.0 | 94.9  | 83.3  | 72.2  | 76.4  | 67.6  | 77.9  | 83.8  | 67.3  | 86.6  | 10 77.50                      |
| 4 M <sub>I</sub> /P.N.B. |      |       |       | 5.5   | 5.2   | 4.5   | 5.1   | 4.9   | 4.1   | 4.7   | 7 4.86                        |

|                          | 1950 | 1955  | 1956  | 1957  | 1958  | 1959  | 1960  | 1961  | 1962  | 1963  | N° of lAver-<br>years<br>ages |
|--------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------------|
| PERU                     |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               | 15.9 | 18.6  | 20.2  | 19.6  | 20.5  | 22.7  | 25.2  | 26.7  | 26.5  | 24.3  | 10                            |
| 2 M <sub>I</sub> /M      | 33.3 | 31.4  | 37.5  | 37.9  | 37.6  | 36.7  | 35.6  | 37.7  | 40.8  | 40.4  | 10                            |
| 3 M/E                    | 90.8 | 111.1 | 124.0 | 139.8 | 134.9 | 100.8 | 86.2  | 94.6  | 99.1  | 102.2 | 10                            |
| 4 M <sub>I</sub> /P.N.B. | 4.8  | 6.5   | 9.4   | 10.4  | 10.4  | 8.4   | 7.7   | 9.5   | 10.7  | 10.0  | 10                            |
| URUGUAY                  |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               |      | 7.9   | 10.0  | 8.1   | 11.5  | 10.7  | 14.3  | 14.2  | 11.6  | 12.5  | 9                             |
| 2 M <sub>I</sub> /M      | 26.3 | 26.2  | 21.7  | 22.0  | 14.1  | 12.7  | 25.2  | 30.9  | 36.1  | 33.0  | 10                            |
| 3 M/E                    | 78.9 | 122.4 | 97.4  | 197.2 | 103.2 | 179.9 | 166.8 | 118.7 | 149.0 | 105.9 | 10                            |
| 4 M <sub>I</sub> /P.N.B. |      | 2.5   | 2.1   | 3.5   | 1.7   | 2.4   | 6.0   | 5.2   | 6.2   | 4.4   | 9                             |
| VENEZUELA                |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               | 34.2 | 36.9  | 38.5  | 41.3  | 34.8  | 32.9  | 34.1  | 35.2  | 35.0  | 32.4  | 10                            |
| 2 M <sub>I</sub> /M      | 31.7 | 36.4  | 42.0  | 51.5  | 44.1  | 30.3  | 27.3  | 23.9  | 25.0  | 25.8  | 10                            |
| 3 M/E                    | 57.6 | 57.1  | 58.8  | 67.6  | 63.7  | 67.8  | 49.6  | 44.0  | 43.2  | 37.7  | 10                            |
| 4 M <sub>I</sub> /P.N.B. | 6.3  | 7.7   | 9.5   | 14.4  | 9.8   | 6.8   | 4.6   | 3.7   | 3.8   | 3.2   | 10                            |
| COSTA RICA               |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               | 26.6 | 25.3  | 22.0  | 24.1  | 24.2  | 20.1  | 20.8  | 20.9  | 23.4  | 22.2  | 10                            |
| 2 M <sub>I</sub> /M      |      | 22.8  | 19.9  | 21.4  | 19.5  | 23.0  | 21.5  | 19.4  | 21.2  | 21.5  | 9                             |
| 3 M/E                    | 85.6 | 108.6 | 136.7 | 124.9 | 109.3 | 135.8 | 134.7 | 131.2 | 121.8 | 129.2 | 10                            |
| 4 M <sub>I</sub> /P.N.B. |      | 6.3   | 6.0   | 6.4   | 5.2   | 6.3   | 6.0   | 5.3   | 6.0   | 6.2   | 9                             |
| CUBA                     |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               | 34.6 | 30.0  | 31.8  | 33.7  | 34.8  |       |       |       |       |       | 5                             |
| 2 M <sub>I</sub> /M      | 9.5  | 14.9  | 16.0  | 18.8  | 18.0  | 20.7  | 16.9  | 23.1  | 27.7  |       | 9                             |
| 3 M/E                    | 91.0 | 103.6 | 102.8 | 105.8 | 116.3 | 109.6 | 103.1 | 112.4 | 145.8 | 160.1 | 10                            |
| 4 M <sub>I</sub> /P.N.B. | 3.0  | 4.6   | 5.2   | 6.7   | 7.3   |       |       |       |       |       | 5                             |
| EL SALVADOR              |      |       |       |       |       |       |       |       |       |       |                               |
| 1 E/P.N.B.               |      | 16.3  | 31.0  | 17.5  | 25.7  | 25.9  | 24.1  | 25.4  | 22.7  | 21.3  | 6                             |
| 2 M <sub>I</sub> /M      |      |       |       |       | 17.8  | 14.6  | 16.2  | 14.0  | 16.6  | 16.0  | 9                             |
| 3 M/E                    | 70.6 | 85.9  | 92.9  | 83.0  | 93.1  | 87.7  | 104.7 | 91.2  | 91.5  | 98.6  | 10                            |
| 4 M <sub>I</sub> /P.N.B. |      |       |       |       | 4.3   | 3.3   | 4.1   | 3.2   | 3.4   | 3.4   | 6                             |

|                          | 1950  | 1955  | 1956  | 1957  | 1958  | 1959  | 1960  | 1961  | 1962  | 1963  | N° of Aver-<br>years ages |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------------------|
| GUATEMALA                |       |       |       |       |       |       |       |       |       |       |                           |
| 1 E/P.N.B.               |       | 13.9  | 14.8  | 13.7  | 12.6  | 12.4  | 13.0  | 12.4  | 12.0  | 14.9  | 9 13.34                   |
| 2 M <sub>I</sub> /M      |       | 18.9  | 26.9  | 23.7  | 22.2  | 21.1  | 20.0  | 20.5  | 21.8  | 21.4  | 9 18.33                   |
| 3 M/E                    | 90.2  | 97.2  | 112.7 | 128.9 | 139.2 | 124.6 | 115.7 | 118.5 | 113.2 | 111.0 | 10 115.12                 |
| 4 M <sub>I</sub> /P.N.B. |       | 2.6   | 4.5   | 4.2   | 3.9   | 3.3   | 3.0   | 3.0   | 3.0   | 3.5   | 9 3.42                    |
| HONDURAS                 |       |       |       |       |       |       |       |       |       |       |                           |
| 1 E/P.N.B.               | 30.2  | 17.9  | 24.4  | 20.2  | 20.8  | 19.7  | 17.4  | 19.8  | 20.7  | 20.6  | 10 21.17                  |
| 2 M <sub>I</sub> /M      |       | 15.1  | 18.8  | 20.5  | 21.8  | 20.0  | 19.7  | 16.2  | 20.3  | 22.3  | 9 19.41                   |
| 3 M/E                    | 70.8  | 128.8 | 92.4  | 123.6 | 110.0 | 105.6 | 159.9 | 108.5 | 103.3 | 115.8 | 10 111.87                 |
| 4 M <sub>I</sub> /P.N.B. |       | 3.5   | 4.2   | 5.1   | 5.0   | 4.2   | 5.5   | 3.5   | 4.3   | 5.3   | 9 4.50                    |
| MEXICO                   |       |       |       |       |       |       |       |       |       |       |                           |
| 1 E/P.N.B.               | 17.0  | 16.8  | 16.1  | 13.3  | 12.0  | 11.6  | 10.7  | 10.8  | 10.9  | 10.8  | 10 13.00                  |
| 2 M <sub>I</sub> /M      | 28.2  | 33.3  | 33.4  | 35.0  | 35.5  | 36.9  | 38.2  | 38.3  | 37.5  | 34.0  | 10 35.03                  |
| 3 M/E                    | 107.2 | 112.8 | 133.7 | 159.0 | 154.0 | 133.9 | 155.5 | 137.8 | 122.9 | 138.6 | 10 135.54                 |
| 4 M <sub>I</sub> /P.N.B. | 5.1   | 6.3   | 7.2   | 7.4   | 6.6   | 5.7   | 6.4   | 5.7   | 5.0   | 5.1   | 10 4.50                   |
| NICARAGUA                |       |       |       |       |       |       |       |       |       |       |                           |
| 1 E/P.N.B.               |       |       |       |       |       |       |       |       |       |       |                           |
| 2 M <sub>I</sub> /M      |       | 23.1  | 21.2  | 22.4  | 20.1  | 19.4  | 17.5  | 19.0  | 22.3  | 23.9  | 9 20.98                   |
| 3 M/E                    | 108.7 | 97.0  | 119.4 | 127.3 | 122.8 | 103.5 | 129.1 | 123.0 | 119.2 | 111.8 | 10 116.18                 |
| 4 M <sub>I</sub> /P.N.B. |       |       |       |       |       |       |       |       |       |       |                           |
| PANAMA                   |       |       |       |       |       |       |       |       |       |       |                           |
| 1 E/P.N.B.               |       | 35.0  | 33.4  | 31.1  | 29.3  | 29.4  | 29.5  | 30.6  |       |       | 7 31.18                   |
| 2 M <sub>I</sub> /M      |       | 11.7  | 14.8  | 14.0  | 14.4  | 15.5  | 13.8  | 18.4  | 15.3  |       | 8 14.70                   |
| 3 M/E                    | 339.1 | 259.3 | 343.8 | 351.5 | 357.6 | 349.3 | 493.0 | 521.2 | 375.9 | 330.4 | 10 372.11                 |
| 4 M <sub>I</sub> /P.N.B. |       | 10.6  | 17.0  | 15.3  | 15.1  | 15.9  | 20.1  | 29.3  |       |       | 7 17.61                   |
| DOMINICAN REPUBLIC       |       |       |       |       |       |       |       |       |       |       |                           |
| 1 E/P.N.B.               |       | 26.2  | 24.9  | 27.8  | 23.4  | 23.2  | 26.0  | 23.4  | 25.6  | 27.7  | 9 25.35                   |
| 2 M <sub>I</sub> /M      |       | 19.5  | 22.3  | 20.5  | 24.0  | 27.3  | 19.4  | 14.8  | 13.4  | 15.9  | 9 19.67                   |
| 3 M/E                    | 57.3  | 99.0  | 102.0 | 85.1  | 110.5 | 105.3 | 55.6  | 56.2  | 85.8  | 106.2 | 10 186.30                 |
| 4 M <sub>I</sub> /P.N.B. |       | 5.1   | 5.7   | 4.8   | 6.2   | 6.7   | 2.8   | 1.9   | 2.9   | 4.7   | 9 4.52                    |



|                        | 1950       | 1955 | 1956 | 1957  | 1958  | 1959  | 1960  | 1961  | 1962  | 1963  | N° of Aver-<br>years ages |
|------------------------|------------|------|------|-------|-------|-------|-------|-------|-------|-------|---------------------------|
| PARAGUAY               | 1 E/P.N.B. |      |      |       |       |       |       |       |       |       |                           |
|                        | 2 M/M      |      |      | 96.3  | 110.8 | 97.4  | 139.6 | 131.2 | 122.6 | 97.2  | 7 113.58                  |
|                        | 3 M/E      |      |      |       |       |       |       |       |       |       |                           |
|                        | 4 M/P.N.B. |      |      |       |       |       |       |       |       |       |                           |
| HAITI                  | 1 E/p.N.B. |      |      |       |       |       |       |       |       |       |                           |
|                        | 2 M/M      |      |      | 115.1 | 109.8 | 108.2 | 109.0 | 131.3 | 108.7 | 93.9  | 7 110.85                  |
|                        | 3 M/E      |      |      |       |       |       |       |       |       |       |                           |
|                        | 4 M/P.N.B. |      |      |       |       |       |       |       |       |       |                           |
| JAMAICA                | 1 E/P.N.B. | 24.0 |      |       | 32.1  | 38.1  | 38.2  | 36.0  | 38.4  |       | 6 34.46                   |
|                        | 2 M/M      |      |      | 132.6 | 136.0 | 148.8 | 136.4 | 122.6 | 122.5 | 111.8 | 7 130.10                  |
|                        | 3 M/E      |      |      |       |       |       |       |       |       |       |                           |
|                        | 4 M/P.N.B. |      |      |       |       |       |       |       |       |       |                           |
| TRINIDAD<br>AND TOBAGO | 1 E/P.N.B. | 67.7 | 71.1 | 75.8  | 71.4  | 69.5  | 66.5  | 78.5  | 73.7  | 75.5  | 9 72.18                   |
|                        | 2 M/M      |      |      |       |       |       |       |       |       |       |                           |
|                        | 3 M/E      |      |      | 90.8  | 96.7  | 99.6  | 102.4 | 98.5  | 102.3 | 100.5 | 7 98.68                   |
|                        | 4 M/P.N.B. |      |      |       |       |       |       |       |       |       |                           |

SOURCE: Calculations based on the statistical figures given in the Statistical Bulletin of Latin America,  
Vol. I, N° 1, and Vol. III, N° 1.

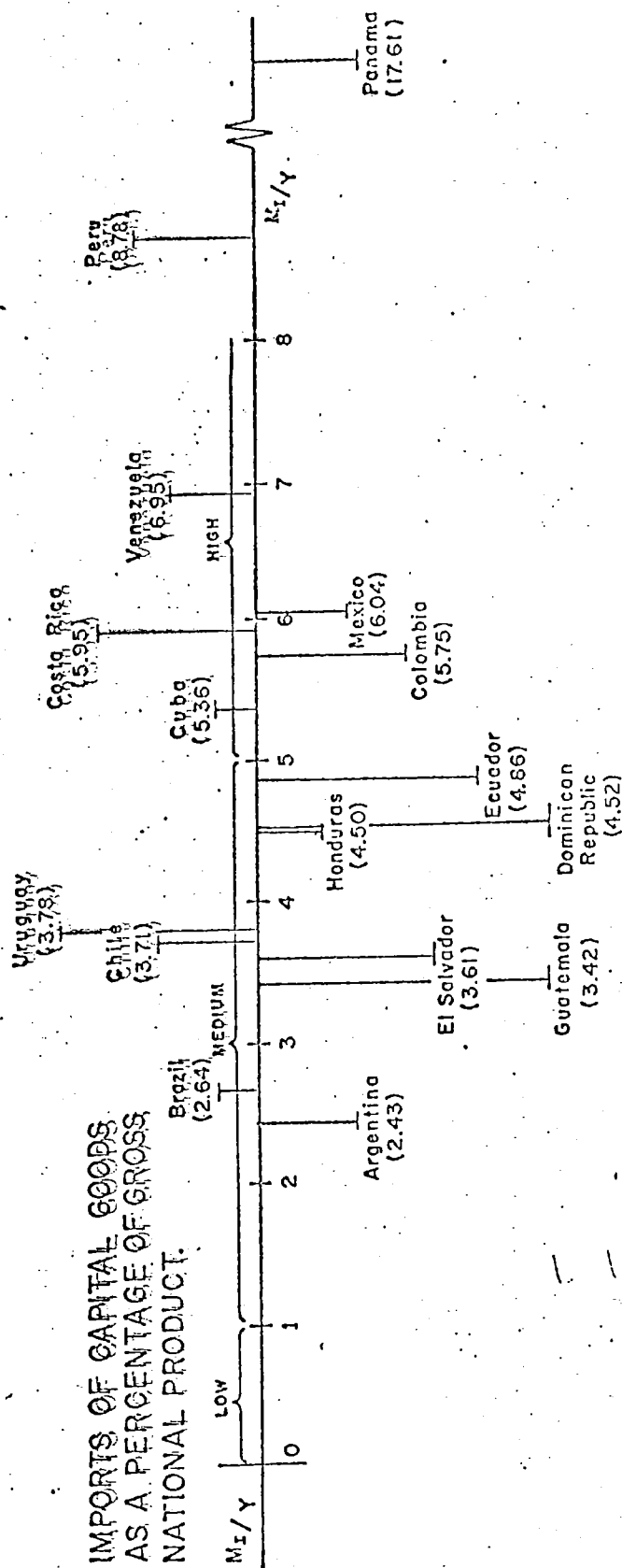


FIGURE 2

group fall some of the countries with the highest growth rates in Latin America. The role of the export sector as a quasi-capital goods sector is extremely important for this group. It may even be said that, in this group, the export sector has been able to eliminate the gross capital goods deficit within the period analyzed.

The countries which fall into the intermediate group with medium external availability possess very unequal characteristics. The lowest values of  $\mu$  are those of Argentina and Brazil which possess low values of  $\epsilon$ . The highest values of  $\mu$  are those of Honduras, Ecuador, and the Dominican Republic, all of which have high values for  $\epsilon$ . The remaining countries are small with low  $\epsilon$  values, such as Guatemala and Uruguay, small with a high  $\epsilon$  value, such as El Salvador, and a medium-sized country with a relatively low value for  $\epsilon$ , such as Chile. It is unquestionably true that for all these countries the export sector is important in that it reduces their gross capital goods deficit. For the case of Chile it can be ventured to state that a net deficit has existed during the period analyzed. And, although the statistical evidence verifies the importance of the export sector's role as a quasi-capital goods sector and its relationship with the saving-investment process, no statistical or other evidence provides a firm base for an estimate concerning the persistence of a net capital goods deficit.

#### 4. Summary: The Strategy Towards the Export Sector

We summarize now the strategies involving the export and capital goods sector through the scheme presented in Figure 2. The economy is divided into income groups designated by the Greek alphabet letters  $\alpha$  (for government),  $\beta$  (for capitalists),  $\gamma$  (employees) and  $\delta$  (workers), and economic sectors designated by the Arabic numeral subscripts 1, 2, 3, and so forth. The major subcomponents of the consumer goods sector are domestic

commodity production, services, and the "quasi-consumer goods sector" (exports converted into consumer goods). The capital goods sector is composed of construction, producers' durables, and the quasi-capital goods sector.<sup>39</sup>

The overall strategy for economic development involves maximizing social welfare over some stipulated planning horizon.<sup>40</sup> It is customary to represent the social welfare function as maximizing the social value of the stream of consumption (per capita) over the planning period subject to appropriate terminal conditions.

As long as low capital formation remains a key bottleneck (binding constraint), the initial development strategy would involve increasing the combined value of Sectors 4, 5 and 6, namely quasi-capital goods, producers' durables, and construction output.<sup>41</sup> However, capital formation involves sacrifice of current consumption, and eventually the sacrifice would become large enough to offset the gain in the form of higher consumption that capital formation brings. The optimum rate of capital formation would be given by comparing the marginal social return from capital formation with its marginal social cost, concepts that can be quantified only by a precise specification of the social welfare function. This is a task which falls outside the scope of the present paper.

---

<sup>39</sup>A statistical problem arises with respect to the classification of intermediate commodity and service industries. Part of these sectors' output can be directed towards capital and part towards consumer goods production.

<sup>40</sup>The choice of planning horizon is a difficult one and, in theory, the controversy between finite and infinite planning horizon is yet unresolved. In practice, however, planners are operating with a planning horizon in the order of fifteen to twenty years.

<sup>41</sup>How far the combined value should be increased would, of course, depend on the ultimate social objectives of development.

Given a general initial strategy of increasing the rate of capital formation, however, the following substrategies of assigning priorities to specific subsectors are suggested:

- a. Priority to Sector 4,
- b. Priority to Sector 5,
- c. Priority to Sector 6.

Which sector or set of sectors should be given priority depends on the "structural" characteristics of each phase of development, as already described. Though any policy recommendations would have to be made on an ad hoc basis, the following general remarks can be made.

Small- and medium-sized economies, that is practically all of Latin America, except Argentina, Brazil, and Mexico, would have to give priority to some combination of sectors 4 and 6. Trade and exports have a continuing, fundamental relationship with the saving-investment process.<sup>42</sup> A major concern of development policy would be to determine the optimum values of the epsilon, omega, and lamda ratios during the planning period.

Still, it can be expected that for small<sup>43</sup> economies such as Nicaragua, Honduras, and Costa Rica, a large share of their capital goods needs will be satisfied by the construction sector. This is especially true if they are predominantly agricultural and/or have a large share - between 40 and 50 per cent of domestic income - of value added originating in services.

---

<sup>42</sup> The variety of, and large optimum plant size needed for producers' durables production, and the consequently prohibitively high production costs make the alternative of giving priority to domestic producers' durables production too costly and its pursuit irrational. This does not preclude producing along some lines belonging to sector 5.

<sup>43</sup> Small economies are, in other words, permanently incomplete systems. Some could still be primitively complete.

| SECTORS<br>IN<br>SPECIAL<br>ZONES | Consumer Goods Production |            |                                       | Capital Goods Production             |                         |              |
|-----------------------------------|---------------------------|------------|---------------------------------------|--------------------------------------|-------------------------|--------------|
|                                   | Domestic Consumer goods   |            | Exports converted into consumer goods | Exports converted into capital goods | Domestic Capital Goods  |              |
|                                   | Commodities               | Services   |                                       |                                      | Machinery and Equipment | Construction |
| Government.                       | $\alpha_1$                | $\alpha_2$ | $\alpha_3$                            | $\alpha_4$                           | $\alpha_5$              | $\alpha_6$   |
| Capitalists.                      | $\beta_1$                 | $\beta_2$  | $\beta_3$                             | $\beta_4$                            | $\beta_5$               | $\beta_6$    |
| Employees.                        | $\gamma_1$                | $\gamma_2$ | $\gamma_3$                            | $\gamma_4$                           | $\gamma_5$              | $\gamma_6$   |
| Workers                           | $\delta_1$                | $\delta_2$ | $\delta_3$                            | $\delta_4$                           | $\delta_5$              | $\delta_6$   |

FIGURE 3

In medium-sized countries, such as Peru, Chile, and Colombia, which have a negligible sector 5 and high needs for capital goods imports, it is the value of sector 4 that has to be given priority. Strategies involving expansion of sector 4 imply either raising the combined value of sectors 3 and 4 or changing their relative composition.

At the other extreme, the expansion of some sectors would contribute little or nothing towards releasing key bottlenecks and may actually work against this policy, so that it may be desirable to put a limit to their expansion. Both the domestic service sector and sector 6 fall in this category, the first because it contributes little to exports (with the exception of tourism) while it leads to heavy imports of consumer goods, and the second because its expansion leads to a more than proportionate increase in the value of sector 3 through a multiplier effect. It may also

be desirable to restrict the share of those income groups which adversely affect the relative importance of sector 3.

Finally, we may conclude by stating that the large Latin American economies, whether still potentially complete or already actually complete economic systems, would have to consider two problems. One involves determination of the optimum rate of import substitution in capital goods industries over the planning period in relation to policies designed to promote growth by focusing on the  $e$ ,  $w$ , and  $\lambda$  ratios. The other will arise as some are confronted with the possibility of having an internal "capital goods surplus" during the current planning horizon, that is their  $S$  ex ante  $< I_d$ , and of being able to fill the gross capital goods deficits of the small- and medium-sized Latin American nations. Such a phenomenon, hopefully developing within a Free Trade or Common Market arrangement, would move them into the fourth phase characteristic of developed nations.