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THE POSTWAR RECORD OF OPEN, DUALISTIC ECONOMIES*

by

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FOREWORD

This working paper is a part of NPA's study of the growth and development of open, dualistic economies. The paper explores the selection and application of growth accomplishment criteria for economies of this type. This effort complements our more intensive theoretical and empirical work on the growth process in several countries in Southeast Asia.

I acknowledge with gratitude considerable assistance from John C. H. Fei in developing the basic approach and methods used in the paper. I am also grateful for assistance from Robert Haven in applying statistical measures and Marcia Brewster, Virginia Draper, Pablo Salazar, and Rodney Smith in data and computational work.

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1. INTRODUCTION

This part of our study is devoted to a general discussion of the growth performance of open, dualistic economies during the postwar period. Postwar experience is viewed from a long-run time perspective to assess growth performance during the 20-year or generation time horizon. Thus, the postwar transition growth experience is viewed in terms of its epochal significance. Progress is assessed on the basis of criteria relevant to the transition from the colonial economic epoch to the modern growth epoch. The purposes of this broader approach are to provide a counterpoint for our more intensive analysis of open dualism within the generation time horizon and to assess performance in a larger sample of countries than the few countries upon which our analysis focusses. In contrast to the present part of the study, much of the other parts are growth process, rather than growth performance, oriented. Our growth performance survey of open dualistic economies in this chapter is thus a part of our empirical work on these economies. More detailed empirical work is undertaken on the several countries to which our growth process analysis is applied.

The first problem confronted concerns the selection of criteria appropriate for evaluating growth accomplishments for the larger sample of countries, as well as for the countries studied more intensively. In our view, these criteria must be derived from a blend of theoretical and empirical guidelines. This task is not so simple as it might appear to be at first glance. The theory of long-run growth of open, dualistic economies is still undeveloped, and little empirical work has been explicitly addressed to the issue of assessing progress during the transition from colonial to modern growth economy.

The growth performance criteria must be explicitly relevant to the transition process in open, dualistic economies. The criteria must emphasize growth performance in terms of the central characteristics of openness and dualism. While much of growth theory and some historical studies[1] have emphasized the fundamental problem of dualism, few studies have sought to relate openness to the problem of development of the dualistic economy. Thus, we find a particular lack of guidance

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[1]Simon Kuznets, as we shall see, has pioneered in providing a basis for developing performance criteria from historical, quantitative studies. He asserts that modern economic growth displays certain "observable and measureable characteristics" which "were not evident in earlier economic epochs." Kuznets clearly believes in the feasibility of establishing these characteristics from historical studies; in his words, "with the help of quantitative and other data wherever such growth occurs." Simon Kuznets in W. W. Rostow (ed.), The Economics of Take-Off into Sustained Growth (New York: St. Martins Press, 1963), p. 42.

from our predecessors in evolving performance criteria germane to assessing the open economy's growth performance.

2. PERFORMANCE CRITERIA: THE EPOCHAL VIEWPOINT

The position we have adopted is that long-run growth performance criteria should be formulated on the basis of country typology. In our case this means that the criteria should be explicitly adapted to the open, dualistic type of economy upon which this entire study focusses. The special characteristic of openness, in particular, identifies a group of economies in which foreign trade performance is a critical aspect of growth accomplishments during the transition. This implies a search for something other than universally applicable transition performance criteria. General criteria of performance, such as growth of per capita income, may be ignored on the assumption that they will be present if the particular performance criteria appropriate to the open, dualistic economy are properly defined.[2] The discussion proceeds, therefore, by considering, in turn, the selection of performance criteria associated with these two basic characteristics.

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[2]A similar view is given in another final report by the NPA Project. See George L. Hicks and Geoffrey McNicoll, "Foreign Trade and the Growth of the Dual Economy: A Study of the Philippines, 1950-66" (Washington: Center for Development Planning, National Planning Association, October 1968), mimeo, p. 49.

2.1 PERFORMANCE CRITERIA ASSOCIATED WITH THE DUALISM CHARACTERISTIC

During the past decade considerable effort has been devoted to evolving a theory of growth appropriate to the dualistic economy. Moreover, several historical studies, some quantitative in nature, have considered growth as a process gradually overcoming the dualism of the less-developed economy.[3] This received body of theory and historical research provides a basis for deriving major criteria for assessing the long-run growth performance of dualistic economies.

Throughout our study the characteristic of dualism is used to describe the compartmentalization of the economy into two major sectors, each with its own set of growth dynamics.[4] For the open, dualistic economy, these sectors are traditional agriculture and an export-oriented enclave. Traditional agriculture employs the bulk of the economy's human resources at low, stagnant levels of productivity, while in the export-oriented enclave labor productivity is higher and expanding. As transition growth proceeds, this dualistic characteristic

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[3]Chief among these studies is the work of Simon Kuznets, summarized in his Modern Economic Growth (New Haven: Yale University Press, 1966).

[4]For a more detailed description of enclave dualism, which is relevant to our study, see Chapter 2.

is gradually eliminated. From the basic economic changes which occur during this process, relevant performance criteria can be derived. Guidance from both theory and inductive evidence is needed to identify those fundamental economic changes which are the significant growth accomplishments from the viewpoint of overcoming dualism.

Three major performance criteria have been selected for this purpose: (1) high and balanced productivity growth, (2) change in the economy's structure of production and allocation of labor, and (3) improvement in utilization of human resources. We briefly consider the origins, meaning, and significance of each of these criteria.

Productivity Growth

Both theory and historical evidence point to the necessity for significant labor productivity gains in both agriculture and nonagriculture if dualism is to be successfully eliminated. Contemporary theory suggests that stagnant dualism will persist unless agriculture becomes involved in the modern growth process through absorbing productivity-increasing growth stimuli from sources outside that sector.[5] There is

[5]See, for example, John C. H. Fei and Gustav Ranis, "Agrarianism, Dualism, and Economic Development," in Irma Adelman and Erik Thorbecke (eds.), The Theory and Design of Economic Development (Baltimore: Johns Hopkins Press, 1966).

a corollary hypothesis that industrial sector growth itself is constrained by stagnant agriculture--through limitations of markets, labor supply, savings transfer capacity, and (in the open economy case) lagging export performance. Such a case is found by Kindleberger, for example, to exist in Chile.[6]

Kuznets' historical findings, based upon the record of presently developed countries, show that development was accompanied by significant productivity gains in both sectors of the dualistic economy. During the long-run course of development, Kuznets finds that productivity gains in agriculture have been near the economy-wide average and that these gains are not merely explained by increasing land and capital per unit of labor.[7] Kuznets concludes, "a substantial rise in productivity of resources in the domestic agriculture sector is a

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[6]Charles P. Kindleberger, Economic Development (Second edition; New York: McGraw-Hill Company, 1965), p. 218.

[7]Kuznets, Modern Economic Growth, pp. 116-120. In general, Kuznets finds agricultural productivity increasing at about the economy-wide average, manufacturing and related activities at a higher rate, and services at a lower.

condition of the large increase in overall productivity in modern economic growth."[8] Intensive individual country studies support this conclusion.[9]

Structure of Production and Allocation of Labor

Economic growth, through its income and consumption effects, induces a shift in the economy's structure of production from agriculture to industry. Ernst Engel first observed a systematic pattern of change in consumer spending patterns as incomes rise, and the modern version of "Engel's Law" depicts demand for agricultural goods (food) as having relatively low income elasticity while income elasticity of demand is higher for nonagricultural goods. With modifications for diversification of consumption through foreign trade, growth must, therefore, be accommodated by a shift in the economy's structure of output from

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[8] Ibid., p. 120.

[9] See, for example, William H. Nichols, "The Place of Agriculture in Economic Development" and K. Ohkawa and H. Rosovsky, "The Role of Agriculture in Modern Japanese Economic Development," in Carl K. Eicher and Lawrence W. Witt (eds.), Agriculture in Economic Development (New York: McGraw-Hill Company, 1964).

agriculture to nonagriculture. Considerable empirical work has been undertaken to verify this relationship between growth and changing sector shares in output.[10]

Kuznets' historical study of thirteen developed countries leads him to accept a refined version of Engel's Law, modifying the income elasticities of demand by such factors as a falling comparative advantage in agriculture and induced changes in consumption associated with urbanization and other growth-related forces.[11]

Inductive studies confirm that the structure of production shifts toward nonagriculture as growth occurs in open, as well as in closed, economies. Even where modern growth is accompanied by continued specialization in agriculture-based exports, the nonagricultural sector grows more rapidly than agriculture (e.g., New Zealand). Nevertheless, the economy in transition may--to a greater or lesser degree--avoid

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[10]Kuznets' evidence, which strongly supports this relationship, is based upon historical experience of individual countries over the course of their development. The relationship is also supported by Chenery's cross-section study of 51 countries. Hollis B. Chenery, "Patterns of Industrial Growth," The American Economic Review, Vol. L, No. 4 (September 1960), pp. 624-654.

[11]Kuznets, Modern Economic Growth, pp. 86-104.

rapid shifts in industrial structure by partially accommodating the changing structure of demand through foreign trade. In the early stages of the transition, therefore, assessing growth accomplishments by the rapidity of changes in the structure of production must take account of the extent to which growth of income and induced changes in demand are accommodated by foreign trade. This latter option, of course, is available only to the open economy with a marked and continuing comparative advantage in agricultural (or other primary product) exports.

Both theory and inductive work point to the necessity for persistent reallocation of labor from agriculture to the nonagricultural sector to accommodate growth of the dualistic economy. Behind this change lie the forces affecting the structure of production, just discussed. On the supply side, modernization of the economy requires substantial expansion of the services associated with urbanization and industrialization. While industrial products can be obtained through foreign trade, services cannot ordinarily be imported. Thus, even where we find foreign trade accommodation providing a larger variety of consumer goods as incomes rise, labor reallocation to the service sector will be needed.

Kuznets' historical study of fourteen developed countries shows significant long-run reallocation of labor from agriculture to

nonagriculture in all. The rate of labor reallocation varies by decades and by countries, but even in countries with agriculture-export oriented open economies the fraction of the labor force employed in agriculture fell significantly.[12]

The necessity for reallocation of labor from agriculture to nonagriculture to accommodate growth stresses the importance of productivity gains in agriculture (mentioned above) as a growth accomplishment. Release of labor from agriculture requires productivity improvements, and we shall demonstrate the logic of this relationship in the next section.

Improvement in Utilization of Human Resources

Theorists of dualistic growth have emphasized the impact of growth upon utilization of human resources.[13] Employment opportunities generated by growth eventually outstrip population growth,

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[12] For example, in Denmark from 42 per cent in 1901 to 19 per cent in 1952; in Canada from 44 per cent in 1901 to 19 per cent in 1951. See Kuznets, Modern Economic Growth, Table 3.2, pp. 106-107.

[13] See, for example, W. Arthur Lewis, "Economic Development with Unlimited Supplies of Labour," in A. N. Agarwala and S. P. Singh, The Economics of Underdevelopment (New York: Oxford University Press, 1963), pp. 400-449, and John C. H. Fei and Gustav Ranis, Development of the Labor Surplus Economy (Homewood, Illinois: Richard D. Irwin, Inc., 1964), especially Chapter 7.

and the economy sheds its labor-surplus characteristic as labor becomes increasingly scarce. Demographic factors are important in affecting the supply side of the labor force. Inductive studies show that, typically, population growth rates rise in early stages of development as a result of falling mortality rates. Relatively high rates of population growth persist over a long period of development, declining only after growth has produced subtle socio-economic changes affecting the birth rate. Kuznets finds high population growth rates to have universally accompanied the development process,[14] and a careful study on Japan similarly shows an increase in population growth rates concomitant with the transition to modern economic growth.[15]

Inductive studies measuring changes in the effectiveness of the utilization of human resources are hampered by conceptual and data problems. Difficulties in defining and measuring "disguised unemployment" have been extensively discussed in the literature, and adequate data on sectoral employment are rarely found in developing

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[14] Kuznets, Modern Economic Growth, pp. 34-56.

[15] K. Ohkawa and H. Rosovsky, "A Century of Japanese Economic Growth," in W. W. Lockwood (ed.), The State and Economic Enterprise in Japan (Princeton: Princeton University Press, 1965).

countries. Such studies as are available suggest that significant progress in eliminating unemployment occurs very late in a country's development history and that, where substantial progress is made, it is accompanied by a declining rate of natural increase.[16] Nevertheless, from the long-run growth accomplishment viewpoint, the rate of expansion of employment opportunities relative to the growth of the available labor force is an important performance criterion.

2.2 PERFORMANCE CRITERIA ASSOCIATED WITH THE OPENNESS CHARACTERISTIC

Empirical Evidence

Performance criteria associated with the economy's openness should ideally refer to both quantitative and qualitative aspects of the economy's foreign trade. Unlike the dualism characteristic, however, a significant body of received theory to guide selection of appropriate criteria does not exist. Thus, selection is based largely upon inductive work and the results of our own study. The existing empirical studies, however, generally lack a historical approach

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[16] In Japan this phase was reached only in the post-World War II period. See Ohkawa and Rosovsky, op. cit., p. 84.

appropriate to assessing changes associated with the long-run transition process from the colonial to modern growth epoch.

Kuznets' studies, cited earlier, are the main source of guidance on long-run foreign trade changes associated with development. We briefly survey his major conclusions. First, on the level of foreign trade (as measured, for example, by the ratio of exports to total product), Kuznets finds that "the extent of participation in foreign trade by underdeveloped countries is distinctly lower than that of developed countries."[17] He warns, however, that the country size factor is the basic determinant of a high trade proportion. Correcting for this factor, development is clearly associated with greater involvement in foreign trade. Kuznets makes a particular inference that "small countries can attain economic growth only through heavy reliance on foreign trade, as indicated by high proportions to national product."[18]

Second, once size is allowed for, Kuznets finds a negative association between level of development, as measured by per capita

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[17]Kuznets, Modern Economic Growth, p. 430.

[18]Ibid., p. 302.

income, and the degree of specialization in a limited number of export commodities. Kuznets finds this to be true both on the basis of cross-section analysis of contemporary countries[19] and long-run experience of presently developed countries.[20] The decline of export commodity concentration, associated with growth, represents a shift away from dependence upon primary products and toward an increased variety of processed raw materials and manufactures.

Third, on the import side, the picture presented by Kuznets makes generalization difficult. There is a significant difference between the historical experience of presently developed countries and the import changes in more recently developing countries, particularly those in Latin America. The history of import composition changes in developed countries is found by Kuznets to parallel roughly those in exports, described as follows: "a slight decline in the share of primary

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[19] Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations: IX. Level and Structure of Foreign Trade: Comparisons for Recent Years," Economic Development and Cultural Change, Vol. XIII, No. 1, Part II (October 1964).

[20] Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations: X. Level and Structure of Foreign Trade: Long-Term Trends," Economic Development and Cultural Change, Vol. 15, No. 2, Part III (January 1967).

products, accounted for by a marked decline in the share of food and agricultural raw materials, and a rise in the share of nonagricultural raw materials; a slight rise in the share of manufactured articles, accompanied by a decline in the share of textiles and a rise in the share of metal products and machinery."[21] In the developing countries, Kuznets notes that imports have shifted toward, not away from, primary products. This shift is largely accounted for by a rise in imports of nonagricultural raw materials used as intermediate goods for domestic manufacturing. Kuznets hints that this amounts to substitution of raw materials imports for finished manufactured goods. The NPA study by Hicks and McNicoll raises the question of this trend reflecting excessive import substitution which may have a negative impact upon growth.[22]

In addition to Kuznets' work, the problem of import structure and economic growth has been extensively studied from an inductive approach.[23] From this substantial body of empirical literature, a

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[21] Ibid., p. 43.

[22] Hicks and McNicoll, op. cit., pp. 67-75.

[23] Most of these studies are referred to in N. A. Adams, "Import Structure and Economic Growth: A Comparison of Cross-Section and Time-Series Data," Economic Development and Cultural Change, Vol. XV, No. 2 (January 1967).

number of conclusions appear to be established. First, significant changes in import structure are associated with growth, evidenced by both cross-section and time series studies. Second, the general pattern of this change are shifts from consumer goods imports toward both intermediate goods (especially this component) and capital goods. Third, country size and import substitution policies have a marked impact upon the particular pattern of these shifts in import structure. Size causes opposite effects between large and small countries upon the share of capital goods imports as growth proceeds. This category of imports rises and remains high in small countries while it falls continuously in large countries. Aggressive import substitution policies result in atypically high shares for intermediate goods and, to a lesser extent, capital goods.

Theory and Selection of Criteria

The theory developed in the earlier sections of our study is needed to guide us through the maze of these inductive results in selecting growth performance criteria related to the characteristic of openness. For this purpose we reiterate here a major emphasis in our approach to the transition of the ex-colonial open, dualistic economy. We have seen that transition growth must be launched from the economic

base inherited from colonialism. In this heritage, the economy's dominant source of savings available to finance a transition to a new growth system is found in traditional export profits. It is the redirection of these profits to finance domestic industrialization which permits a departure from colonial-type growth dynamics. This source of finance is used to launch transition growth in both the abrupt break with colonialism associated with politically-pushed industrialization (Chapter 9) and the more moderate strategy of neo-enclave, export-led industrialization (Chapter 10).

Export Performance

The theory we have offered to explain the growth process under alternative development strategies emphasizes that satisfactory export performance is critical to successful launching of the transition. Regardless of the growth system pursued during the transition, exports play a crucial role in economic growth. In politically pushed industrialization, for example, agricultural exports are the base from which profit transfers are made to finance import substitution investment. In neo-enclave, export-led transition growth, the pace of industrialization is controlled by the rate of export growth. Thus, a first growth criterion associated with openness must be formulated in terms of the economy's

export performance during the first generation of the transition. Our own empirical work on Southeast Asian countries, in which postwar growth variables were distorted by wartime devastation and subsequent reconstruction, leads us to view successful transition performance as maintenance of an existing high export ratio or increasing a depressed export ratio. A significant decline in the export ratio, or failure to raise a depressed export ratio, is viewed as performance which will jeopardize the chances for a successful transition to a modern economy.

Once the transition is launched from the traditional primary product export base, our theory points to an important performance criterion that has to do with a change in export composition. We have demonstrated the inevitability of the termination of the import-substitution thrust to growth and built-in growth retardation of the neo-enclave system. In both, continued growth beyond the initial period of the transition requires an eventual shift from traditional primary product exports to an increasingly diversified pattern. Although diversification of agricultural exports and discovery of new primary products (e.g., minerals) may serve as a temporary palliative, a fundamental change in the composition of exports is essential for long-run success. Export substitution in the sense of gradual substitution of industrial exports for traditional agricultural exports is thus selected

as the second major performance criterion associated with the economy's openness.

Import Composition

Although changes in import composition are not included in our statistical implementation of general performance criteria,[24] we briefly note the relevance of these changes to growth of the open, dualistic economy. We have seen from our brief survey of empirical studies that criteria associated with changing import structure are obscured by the conflicting patterns associated with country size and policy matters. Our theory is of particular use in sharpening the growth-relevant criteria in this regard. Regardless of the transition strategy pursued, specific changes in import structure are required to accommodate transition growth. The dominant colonial import pattern emphasizing manufactured consumer goods and intermittent inflows of capital goods must give way to a pattern consistent with the new growth process. Capital goods, accompanied by intermediate goods

[24] The import composition criterion is applied to our case study countries in an earlier chapter to verify the existence of particular growth types.

for industry, must increase as export profits are transferred to the finance of domestic industrial investment (and the colonial phenomenon of capital export disappears). Dependence upon imported manufactures will decrease as output flows from investment in the domestic industrial sector. Thus, our theory predicts that the transition will be accompanied by a shift in the composition of imports from consumers to producers goods. We may observe, however, that in the case of the gradual transition of the neo-enclave type, this shift will be less rapid than in the case of politically pushed industrialization. Moreover, where prolonged politically influenced industrialization persists (and this phase becomes artificially elongated), the import composition shift toward intermediate industrial goods and capital goods is predicted to be particularly pronounced.

Thus, the early stage of transition in an open, dualistic economy will inevitably involve a shift in import structure from consumer goods toward producers goods. From the long-run viewpoint, this shift may be gradual or sharp, but it must occur if a break from the colonial enclave economy is made as a new growth regime is initiated. The factor of size is unlikely to affect this <u>initial</u> change in import composition significantly, but it appears likely (as the empirical studies suggest) that size has an important bearing upon later variations in changes in import composition.

3. MEASUREMENT OF PERFORMANCE CRITERIA

3.1 REQUIREMENTS

The performance criteria introduced in Section 2 must be converted to quantitative measures capable of being implemented from data available for open, dualistic economies. Since the criteria are chosen to reflect the extent of long-run growth accomplishments during the postwar generation, measurement must be based upon time series covering a significant part of this period. Ideally, the series should begin in approximately 1950 and continue to the present. Thus, the measures of the performance criteria selected must be adaptable to data series available in at least a representative group of open, dualistic economies.

A second important requirement for the performance measures is that they be consistent with the overall empirical framework developed for the open, dualistic economy (presented in Chapter 7). This implies the further attribute that the measures must be appropriate to a general equilibrium framework to insure that the set of measurements possess internal consistency. Thus, the several measurement indices used must all be implemented within the consistent set of national income accounting estimates for the open, dualistic economy.

A third and obvious requirement is that the performance measures properly gauge changes related to the performance criteria selected in Section 2. They must be adapted to the growth-relevant changes in both of the economy's dominant characteristics, dualism and openness.

3.2 METHODOLOGY

In the two following sections we introduce basic equations, conforming to the requirements just specified, for measuring growth accomplishments in open, dualistic economies. Before proceeding to that task, we begin, in this section, by discussing the abstract method developed for specific applications below. The abstract discussion is relevant to the two basic performance equations we introduce in Sections 3.3 and 3.4.

The mathematical tools required for our method are based on the following simple equations of growth rates. Letting $\eta = (dx/dt)/t$ be the rate of growth of the time variable "x," we have:

1a) $\eta_{ab} = \eta_a + \eta_b$ (rate of growth of product)

b) $\eta_{(a+b)} = V_a\eta_a + V_b\eta_b$ (rate of growth of sum)

where $V_a = \frac{a}{a+b}$ and $V_b = \frac{b}{a+b} = 1 - V_a$

c) $\eta_{1-V} = -\eta_V \frac{V}{1-V}$ (rate of growth of 1 - V)

d) If $i = w_a a + w_b b$ and $w_a + w_b = 1$, then:

$$\eta_i = C_a \eta_a + C_b \eta_b + C_w \eta_{w_a}$$

(rate of growth of the index "i" which is a "weighted average" of a and b)

where $C_a = \frac{aw_a}{i}$, $C_b = 1 - C_a = bw_b/i$, and

$$C_w = \frac{w_a}{i}(a - b) = C_a(1 - b/a)$$

Proof $\eta_i = C_a \eta_{aw_a} + C_b \eta_{bw_b}$ (By Equation 1b)

$= C_a \eta_a + C_b \eta_b + C_a \eta_{w_a} + C_b \eta_{w_b}$ (By Equation 1a)

$= C_a \eta_a + C_b \eta_b + C_a \eta_{w_a} - C_b \eta_{w_a} \frac{w_a}{w_b}$ (By Equation 1c)

$= C_a \eta_a + C_b \eta_b + \eta_{w_a} \frac{w_a}{i}(a - b)$

Q.E.D.

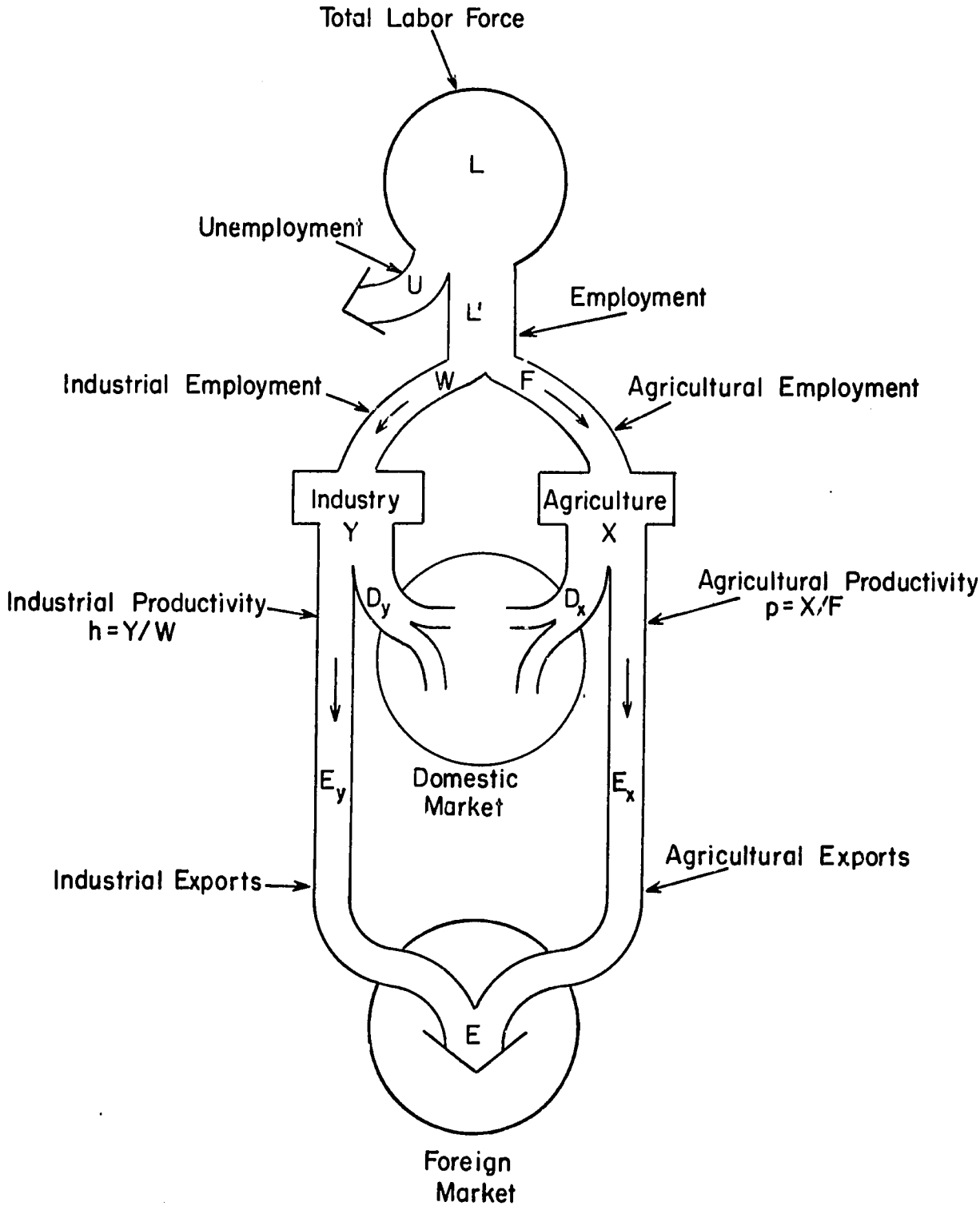
The last result (1d) states that the rate of growth of the weighted average "i" is decomposable into three terms corresponding to the "rate of growth of a," the "rate of growth of b," and the "rate of growth of the weight." For example, when "a" is greater than "b," the interpretation of the last term is that increasing the weight on the larger number ($\eta_{w_a} > 0$) will lead to an increase of the weighted average (i).

3.3 THE INCOME EXPANSION EQUATION

Based upon the method just discussed, we now proceed to develop our first major performance measure for empirical application to open, dualistic economies. Formally, the model used for this purpose contains eleven variables (L, U, L', W, F, X, Y, D_x, D_y, E_x, and E_y), representing the structure of an open, dualistic economy as shown in Diagram 1. The total labor force, L, contains an unemployed part (U) and an employed part (L'). The employed part of the labor force is allocated between industrial employment (W) and agricultural employment (F). Output (Y) produced by the industrial sector is either absorbed by the domestic market (D_y) or by the foreign market as exports (E_y). Agricultural output (X) is allocated in a similar way, D_x being the domestic share and E_x, the foreign market share. This model emphasizes that the operational significance of dualism refers to the production structure of the domestic economy while the significance of openness refers to the existence of a foreign sector as an alternative market to absorb domestically produced output.

The aggregate index of economic performance is average labor income. If unemployment exists, however, two concepts must be distinguished. Let us take X + Y (the sum of value added by the two

Diagram I: The Open Dualistic Economy



production sectors) as a measurement of GNP (i.e., total net output) and take L as the total labor force. We define:

2a) Average labor income: $z = (X + Y)/L$ (GNP per unit of total labor force)

b) Labor productivity: $g = (X + Y)/L'$ (GNP per unit of <u>employed</u> labor force)

c) $z = g(L'/L)$ (By Equations 2a, b)

Equation 2c shows that "z" is a product of "g" and the <u>degree of employment</u> ($m = L'/L$). Notice that in the dualistic context the labor productivity for the economy as a whole (g) is a weighted average of labor productivity in the industrial sector ($h = Y/W$) <u>and</u> the agricultural sector ($p = X/F$). We can summarize these relations as:

3a) $m = L'/L$ (degree of employment)

b) $h = Y/W$ (labor productivity in industry)

$p = X/F$ (labor productivity in agriculture)

c) $\theta = W/L'$; $1 - \theta = F/L'$ (labor allocation fractions)

d) $g = \theta h + (1 - \theta)p$ (By Equations 2b, 3b, c)

e) $z = m[\theta h + (1 - \theta)p]$ (By Equations 2c, 3a, d)

The last equation (3e) summarizes the essential factors determining the magnitude of labor productivity (z) in the dualistic economy at any point in time: the degree of employment (m), the labor allocation fraction (Θ), and the sectoral productivities (h and p). Finally, in the context of growth performance the focal point of analysis is on the relations involved with the change of these magnitudes. Applying Equations 1a, b, c, d to Equation 3e, we readily obtain:

4a) $\eta_z = C_y \eta_h + C_x \eta_p + (\Theta \eta_\Theta / g)(h - p) + \eta_m$ where

b) $C_y = h\Theta/g$; $C_x = 1 - C_y = p(1 - \Theta)/g$

Equation 4a will be referred to as the income expansion equation. It is a definitional truism (like the equation of exchange), depicting a basic relation between certain key forces of expansion in the dualistic economy. While the term on the left-hand side (η_z) is the rate of expansion of labor income, the four terms on the right-hand side represent, respectively, the (weighted) industrial productivity expansion effect, the (weighted) agricultural productivity expansion effect, the labor allocation effect, and the employment effect.

The income expansion equation is designed to give a quantitative basis for measuring growth performance of the dualistic economy. In such an economy, the basic growth issue--expansion of

labor income (i.e., η_z in the growth equation)--must be studied in the context of a transition process during which the economy's center of gravity will be shifted from the agricultural sector to the industrial sector. Central to this transition process is the rapidity of labor reallocation from the agricultural sector to the industrial sector (corresponding to the term η_θ in Equation 4a). Reallocation must be rapid enough to overcome population pressure if industrialization is to be achieved. Rapid expansion of agricultural productivity (the term η_p in Equation 4a) is a necessary condition to accommodate and facilitate this labor reallocation process to allow agricultural workers to be "released" to the industrial sector. Simultaneously, the rate of expansion of industrial productivity (the term η_h in Equation 4a) must be fast enough to accommodate a high rate of capital accumulation in the industrial sector to provide employment opportunities to absorb the surplus labor released by the agricultural sector. If these accomplishments are sustained, surplus labor will gradually be reduced by growth of employment opportunities (the term η_m in Equation 4a). It is now apparent that the income expansion equation may be interpreted as summarizing certain key accomplishments required for growth of the dualistic economy--labor productivity gains in the two basic sectors, labor reallocation and elimination of unemployment. Thus interpreted,

the equation is a convenient and flexible tool for assessing growth performance of dualistic economies.

To assist in identifying the factors affecting the time pattern of growth we separate the four factors into two groups. The two sectoral productivity growth terms (η_h and η_p) are construed to be of a higher causal order than the allocation and employment terms. Productivity growth in both sectors is prerequisite (a necessary condition) to allow the other forces to contribute to growth. In the time span taken as our frame of reference (roughly 20 years), productivity growth occurs early and, persisting over an adequate period, will induce eventual change of a more basic kind in which the economy's utilization of labor resources is affected.

Allocation Effect

There is, first, a causal relationship between sectoral productivity expansion (η_h and η_p) and the allocation effect (η_θ). Income growth precipitates eventual reallocation of labor primarily through the underlying demand relationship ("Engel's Law," discussed in Section 2.1). As productivity and income grow, demand for industrial output eventually rises more rapidly than demand for agricultural output.

Let us define L', W, F, X, Y, p, and h as before. Let μ be the ratio of "available industrial goods" to "available agricultural goods." In a closed economy, $\mu = Y/X$; i.e., the only source of available goods is domestic output. For the closed economy case, we have:

$$\left.\begin{array}{ll} \text{5a)} & \eta_\mu = \eta_Y - \eta_X \\ \text{b)} & \eta_Y = \eta_h + \eta_W \\ \text{c)} & \eta_X = \eta_p + \eta_F \end{array}\right\} \Longrightarrow \eta_Y - \eta_X = \eta_h + \eta_W - \eta_p - \eta_F$$

$$\text{d)} \quad \eta_Y - \eta_X = \eta_h - \eta_p + \eta_{W/F}$$

$$\text{e)} \quad \eta_\mu = \eta_h - \eta_p + \eta_\Theta \frac{1}{1 - \Theta}$$

$$\text{f)} \quad \eta_\Theta \frac{1}{1 - \Theta} = \eta_\mu + \eta_p - \eta_h$$

The three terms on the right-hand side of Equation 5f summarize the forces (identifiable in our framework) which cause labor reallocation. We see that a higher rate of labor reallocation is induced by:

(i) high demand for industrial goods relative to agricultural goods (η_μ)

(ii) a high rate of increase of agricultural productivity (η_p)

(iii) a low rate of increase of industrial productivity (η_h)

It is clear from this equation that along the growth path of a closed dualistic economy significant labor reallocation can occur if and only if relatively high increases in agricultural productivity are sustained. Given the high fraction of agricultural population, increases in agricultural productivity lead to generally higher levels of per capita income. This leads to higher values for the Engel's Law effect (η_μ), in turn causing $\eta_\theta \frac{1}{1 - \theta}$ to have high values. Conversely, where agricultural productivity does not expand ($\eta_p = 0$), expansion of industrial productivity (η_h) alone will have a negative effect on labor reallocation.

In the case of an open, dualistic economy, the labor reallocation problem is somewhat more complex. In this case, the domestic allocation adjustment may be tempered by an external adjustment to the demand forces expressed by Engel's Law. We now investigate this problem.

Assuming that all exports originate from the agricultural sector, we define:

$\xi = E/X$	Degree of export orientation
$t =$	Terms of trade (price of export goods in terms of import goods)
$E = \xi X$	
$M = tE = t\xi X$	

We may then write:[25]

$$6a)\quad \mu = \frac{Y + t\xi X}{X - \xi X} \Longrightarrow \mu(1 - \xi)X - t\xi X = Y$$

and

$$b)\quad jX = Y \quad \text{where} \quad j = (\xi)\ (-t) + (1 - \xi)\mu$$

$$c)\quad \eta_j + \eta_X = \eta_Y$$

$$d)\quad C_\mu \eta_\mu + \eta_p - \eta_h = \eta_\Theta \frac{1}{1 - \Theta} + C_t \eta_t + C_\xi \eta_\xi$$

Equation 6d is an extension of the domestic allocation adjustment given in Equation 5f. The new terms $(C_t\eta_t + C_\xi\eta_\xi)$, referred to as the <u>external adjustment terms</u>, are added to the internal adjustment term (i.e., the labor reallocation term, $\eta_\Theta \frac{1}{1 - \Theta}$). The economic interpretation is that the openness of an economy presents an alternative time pattern of growth denied the closed economy. In response to productivity increases and the induced Engel's Law effect, the open economy may adjust through external trade as well as through domestic labor reallocation. An <u>externally oriented type of growth pattern</u> is one in which the adjustment basically relies upon the external

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[25]See Technical Appendix.

mechanism. In such a pattern, sustained productivity increases will not induce significant reallocation of labor in the time perspective of our study. In simple terms, this pattern occurs when foreign trade is used to meet growing demand for industrial goods by transforming agricultural exports into industrial imports. While this pattern emphasizes agriculture for export development, nonagricultural activities will also show productivity gains and eventually industrial processing and other manufacturing activities will likely appear.

We contrast this pattern with the alternative in which the adjustment occurs basically through the domestic reallocation of labor, referred to as the internally oriented type of growth pattern. We consider these alternative types to be the two basic "success" growth patterns for open, dualistic economies.

We begin with the common presumption that developing economies will follow the internally oriented type of growth pattern unless special conditions exist. The special circumstances which may produce the alternative externally oriented course include both demand and supply factors. Both must be favorable to the rapid growth of agricultural exports, which, in turn, requires a continual process of diversification of export commodities. External demand must be buoyant enough to prevent deteriorating terms of trade. Meeting the

challenge of diversification, fundamental to the viability of an externally oriented growth pattern, requires a satisfactory domestic supply response. Two sets of domestic conditions are thus critical for success--entrepreneurship and resource endowments. Domestic entrepreneurship must be forthcoming to perceive and act upon the opportunities presented by foreign markets. Land must be abundant and adaptable to a wide variety of products and location must be appropriate for communication with and cheap transport to external markets.

Viewed in the broad perspective of long-run growth of open, dualistic economies, the contrast between externally oriented and internally oriented growth patterns is basically a matter of the extent to which labor reallocation (η_θ) can be temporarily postponed. During the time horizon studied in this paper (15-20 years), it is possible that labor reallocation may be completely avoided. We believe, however, that economic history teaches the inevitability of eventual domestic adjustment to the demand forces resulting from sustained productivity expansion. Apart from the short-run obstacles (adverse terms of trade, limitations to diversification) to external adjustments which some economies may confront from the beginning, there are basic longer run deterrents that will eventually force the burden of adjustment upon domestic reallocation. (1) Technical limitations for the required

diversification of tropical agriculture will eventually be reached. Higgins, in fact, believes that "In geographic terms, it appears that the comparative advantage of advanced countries is greater in agriculture than it is in industry" and "the relative disadvantages of the tropics are more stubborn in the field of agriculture, however, than in the field of industry."[26] (2) Increasing diversification, in response to demand, will require progressively more intensive industrial processing of agricultural output for export, eventually causing the industrial sector to grow more rapidly than agriculture. (3) On the supply side, the population-land ratio will continue to increase, inducing a shift from land-intensive to capital-intensive agricultural export products. In the historical experience of other small, open economies initially pursuing the externally oriented growth pattern (e.g., New Zealand and Denmark), this shift led eventually toward industrialization and urbanization, inducing labor reallocation.

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[26] Benjamin Higgins, Economic Development (New York: W. W. Norton, 1959), pp. 267 and 273.

Employment Effect

Second, we investigate the relationship between sectoral productivity gains and the employment effect (η_m). The essence of this relationship from the viewpoint of growth is the progressive elimination of unemployment. The pace at which unemployment may be eliminated requires brief reference to a theory of employment appropriate to less developed countries.[27] Such a theory must be cognizant of the major determinants of demand for industrial labor and those affecting its supply during the growth process. On the demand side, there is general agreement that the rate of growth of capital stock is of dominant importance. An additional factor of considerable significance is the mix of labor-intensive and capital-intensive productive techniques since this affects the amount of labor employment made available by a given capital stock.

In the "success" case of continuing productivity increases combined with some degree of domestic austerity, the rate of capital

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[27]Such a theory is basically different from the Keynesian type of theory, designed for the wealthy economies and attributing unemployment to inability to make use of productive capacity. In less developed countries, the crucial problem is the inadequacy of productive capacity rather than their over-abundance, making Keynesian theory largely irrelevant.

accumulation will accelerate over time--thus, all other things being equal, providing growing demand for employment.[28] Moreover, there is evidence that capital-intensive techniques dominate in the early stages of development. Adoption of capital-saving production methods tends to be delayed until entrepreneurship acquires experience needed to adapt technology to the economy's labor surplus.

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[28]This may be shown with the aid of a simple formulation. First, the rate of growth of capital for the economy as a whole, K, may be written as:

$$\eta_K = I/K = \frac{Q - C}{K} = \frac{1 - C/Q}{K/Q} = \frac{1 - (C/L'/Q/L')}{k} = \frac{1 - \bar{c}/z}{k}$$

as determined by k (capital-output ratio), z (labor productivity), and $\bar{c}$ (consumption per head of employed labor). If we make the realistic assumption that k is constant, then increasing labor productivity (z) will lead to a growing capital accumulation rate if the consumption standard ($\bar{c}$) does not rise (i.e., if the economy is austerity oriented). (In a labor-surplus economy, such austerity is built in by the existence of the large reserve of unemployed labor, an argument made famous by Lewis.)

The rate of increase of employment, L', under the constant capital-output assumption may be written:

$$\eta_{L'} = \eta_Q - \eta_z = \eta_K - \eta_z = \frac{1 - \bar{c}/z}{k} - \eta_z$$

Thus, given a constant rate of increase of labor productivity, the mere fact that z is increasing shows that the rate of growth of employment ($\eta_{L'}$) must accelerate. This reveals the logic of the position that (1) productivity gains can induce employment and (2) the employment effect, though at first delayed, will accelerate.

On the supply side, special forces are set in motion to increase the labor force early in the growth process. Sharp increases in participation rates swell the supply of population available for employment. Similarly, demographic forces, responding to growth, exert an expansionary effect on the labor force by extending longevity. Death rates fall rapidly as productivity increases, while the offsetting decline in birth rates ordinarily lags several decades--well beyond our present time horizon. There is a further supply side factor having to do with training labor for industrial employment which tends to delay the absorption of the available labor force into industrial employment.

All of these factors which are set in motion by productivity increases point toward a delayed response of the employment effect. The supply side factors have a one-shot character in the early stages of development, and their dampening effect on eliminating unemployment is gradually overcome. Similarly, on the demand side, the technology factor and the acceleration of capital accumulation also point to the likelihood that the capability of increasing the labor force's utilization rate will be delayed but, once underway, will accelerate.

To recapitulate, long-run "success" of development for the dualistic economy may be defined in terms of achievement of labor reallocation ($\eta_\Theta > 0$) and elimination of unemployment ($\eta_m > 0$).

Prerequisite to eventual realization of these goals is balanced and sustained expansion of sectoral productivity (η_h, η_p) at adequate levels. We have shown that even when the productivity prerequisite is met, there are alternative patterns of growth, differing in the extent to which the labor reallocation effect can be postponed (i.e., by the externally oriented growth pattern) or the employment effect delayed--within our time perspective of 20 years.

We have yet to consider cases of "failure." Ignoring the completely stagnant case (i.e., $\eta_h = \eta_p = 0$), we define failure as <u>unbalanced</u> (or biased) expansion of the sectoral productivities in which either the agricultural <u>or</u> the industrial productivity gain is near zero. For all practical purposes, we may focus attention on one of these polarized cases; i.e., the case of "hothouse industrialization" (characterized by stagnant agricultural productivity).

In this prime case of failure, the agriculture sector is not performing certain roles for balanced growth of dualism. Ideally, these roles center about the production of an adequate volume of agriculture surplus (i.e., goods produced by, but not consumed within, the agricultural sector). This surplus has two aspects of central significance for growth. First, in the real sense, it is used to provide subsistence for the labor transferred to the industrial sector. This labor

is devoted to the production of capital goods to augment productive capacity, thereby increasing employment opportunities in the industrial sector through time. This is the well known thesis of the use of agriculture surplus as a "wage fund" to finance real capital accumulation in the industrial sector. It is this thesis which provides the basic economic explanation of the empirically observed fact, referred to earlier, that "a substantial rise in productivity of resources in the domestic agriculture sector is a condition of the large increase in overall productivity in modern economic growth."[29]

Second, the agricultural income generated by the surplus is partly retained by the agricultural sector to enhance agricultural productivity[30] and partly transferred to industry (as industrial profits) to finance industrial sector productivity expansion through real capital accumulation.

When agricultural productivity fails to expand, industrialization inevitably produces internal strains along the growth

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[29] Simon Kuznets, Modern Economic Growth (New Haven: Yale University Press, 1966), p. 120. In his monumental empirical study, Kuznets repeatedly stresses this theme. See especially pp. 113-127.

[30] Such income may be used to purchase from the industrial sector incentive-type consumer goods, productivity-increasing intermediate goods (e.g., fertilizer) or capital goods.

path. Despite productivity gains in the industrial sector, the country will be unable to progress toward the long-run objectives of labor reallocation (η_Θ) and the elimination of unemployment (η_m). However, the direct and obvious cause of distress will appear as worsening of the internal terms of trade against the industrial sector causing wage-price inflation induced by food shortage. However, these and other internal strains are but technical symptoms, reflecting basic agricultural stagnation, and it is this fact of agricultural stagnation which eventually halts growth of the industrial sector. These predictions are derived from the "wage fund" thesis and describe the failure case for dualistic development in a closed economy.[31]

If the dualistic economy is also open, the mechanism of employing an agricultural surplus to finance industrial expansion is different from that described for the closed economy. In the open economy, the mechanism exhibits a triangular pattern, linking domestic agriculture and industry through the foreign sector. The agricultural surplus takes the form of agricultural exports which are both the source

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[31]See John C. H. Fei and Gustav Ranis, Development of the Labor Surplus Economy (Homewood, Illinois: Richard D. Irwin, Inc., 1964), Chapter 5.

of industrial profits[32] and foreign exchange to provide the import requirements for industrial expansion--capital goods, raw materials, and even food. In contrast to the wage fund of the closed economy, the agricultural surplus provides an "import fund" for the open economy. Associated with this triangular pattern among the agricultural export sector, the foreign sector, and the industrial sector is an import-substitution emphasis in industrialization to accommodate a shift in the composition of imports from predominantly finished industrial consumer goods to the required mix for industrial expansion. In a situation where agricultural productivity is rising and domestic markets expanding, we would expect a gradual tendency toward greater diversification of industrial output.

Where hothouse industrialization, favoring industrial development and neglecting agricultural productivity, exists, however, this growth pattern will eventually lead to stagnation in the industrial sector itself and the economy's growth will cease. Failure of agricultural productivity to rise will eventually erode the agricultural

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[32]The agricultural surplus may be converted to industrial profits through policy devices (e.g., foreign exchange and tax) or, given adequate financial development, it may represent agricultural sector ownership of industrial capital. The case of employing government policies to transfer agricultural export profits to industrial entrepreneurs was analyzed in Chapter 9.

surplus, thus preventing further financing of industrial capital formation and depriving industry of imported inputs essential for its operation. Capital formation and productivity growth in the industrial sector will cease expanding, thus eliminating possibilities of progress on the allocation and employment criteria. The first symptom of crisis will appear as balance of payments strains as agricultural exports progressively fall behind the industrial sector's import requirements.

The basic factor of flagging agricultural productivity is inherent in the dynamics of hothouse industrialization. Preconditions for raising agricultural productivity through agricultural infrastructure investment and institutional change will be avoided in the quest for rapidly creating an industrial base from the agricultural export surplus. In Chapter 9 we have seen that unmitigated import-substitution policies are associated with exerting maximum squeeze upon domestic agriculture to produce high short-run profits for the favored industrial entrepreneurs. As high-profit, import-substitution opportunities are exhausted, industrial profits may become increasingly dissipated through capital flight. Without a major reversal of policies, agricultural stagnation will continue.

3.4 EXPORT ORIENTATION EQUATION

The second basic performance measure stresses the <u>openness</u> aspect of the open, dualistic economy. It is based upon the same mathematical method (Equations 1a, b, c, d) and model structure (Diagram 1) as the income expansion equation, just discussed.

Taking X + Y, as before, as a measure of GNP and E = exports, we define:

7a) $q = E/(X + Y)$ (export ratio)

b) $E = E_y + E_x$ where E_y is industrial exports and E_x is agricultural exports

c) $P_y = E_y/E$ (share of exports produced by industrial sector)

d) $P_x = E_x/E$ (share of exports produced by agricultural sector)

e) $q = E_y/(X + Y) + E_x/(X + Y)$ (By Equations 7a, b, c)

Notice that in the dualistic economy context, the export ratio is a weighted average of the export contributions of the sectors, industry and agriculture. Applying Equations 1a, b, c, d, to Equation 7d, we may write:

8a) $\eta_q = P_y \eta_{\xi_y} + P_x \eta_{\xi_x} + P_y \eta_{\lambda_y} + P_x \eta_{1-\lambda_y}$

where

b) $\xi_y = E_y/Y$ (degree of industrial sector's export orientation)

c) $\xi_x = E_x/X$ (degree of agricultural sector's export orientation)

d) $\lambda_y = Y/(X + Y)$ (degree of industrialization)

The third and fourth terms in Equation 8a may be rewritten so that the equation reads:

9) $\eta_q = P_y \eta_{\xi_y} + P_x \eta_{\xi_x} + \frac{\eta_{\lambda_y} \lambda y}{q} (\xi_y - \xi_x)$ (Export Orientation Equation)

Equation 9, the export orientation equation, decomposes the rate of change in the economy's export ratio, η_q, into three components. It shows that the change in the economy's export orientation is determined by the weighted change in the export orientation of industry, $P_y \eta_{\xi_y}$, the weighted change in the export orientation of agriculture, $P_x \eta_{\xi_x}$, and change in the degree of the economy's industrialization (the last term). We note from the last term that industrialization will depress the rate of growth of the economy's export orientation if the agricultural sector's export orientation is

larger than that of industry (i.e., where $\xi_x > \xi_y$)--as is typical in less developed countries. The export orientation equation will be applied in Section 4 in the form given by Equation 9.

The export orientation equation is useful, when applied to country data, for measuring the export performance criteria discussed in Section 2.2. First, it provides an aggregate measure of the economy's export performance, η_q. This measure, for example, will indicate the rate of progress toward increasing the open economy's export orientation, an essential condition for launching the transition in an economy with a low export value at the beginning of the transition (e.g., China: Taiwan, Korea). Second, the export orientation equation measures, through time, the export contribution of the two dualistic sectors to the economy's export orientation, distinguishing the export performance of the two sectors, agriculture and nonagriculture. Finally, the equation can measure the effect of changing sector product shares on the economy's export orientation. For this reason, the last term in Equation 9 may be described as the <u>shift effect</u>. In the latter connection, we emphasize the depressing effect of industrialization upon the export orientation of an agricultural export economy. An industrializing economy of this type must substitute industrial for agricultural exports if it is to maintain or increase the economy's

export orientation. The last term of Equation 9 measures the extent to which the economy succeeds in this objective, overcoming the typically negative pull of the shift effect.[33]

Degrees of Success

In this section we advance certain guidelines for judging performance on the basis of the export orientation equation. As we have just seen, Equation 9 measures the change in the economy's export orientation, the change in the export orientation of the two dualistic sectors (nonagriculture and agriculture), and the effects of shifts in the economy's output shares between the two sectors ("the shift effect").

Heuristically, we consider a first distinction necessary for assessing performance in terms of change in the overall export orientation during the first generation of the transition. This distinction has to do with the initial level of the economy's export orientation, as measured by the export ratio, $q = E/X + Y$. On the one hand, where the export ratio is sufficiently high to allow growth by one of the

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[33]The shift effect will obviously be negative so long as $\xi_x > \xi_y$.

mechanisms relating foreign trade to domestic investment (as discussed in Chapters 9 and 10), maintenance of the economy's initial export orientation may be adequate to accommodate satisfactory growth performance. This level is taken to be in the range of q = .20 - .50, depending on the size of the country and other variables. Where very high levels of export orientation, at the upper end of this range, were inherited from colonialism, a slightly declining export orientation may even be consistent with open, dualistic growth for the first generation of the transition. On the other hand, where an open, dualistic economy begins the transition with a low export ratio (e.g., below .10), success must be defined in terms of raising the economy's export orientation. For such a case, our analysis in earlier chapters suggests that launching the transition and maintaining growth momentum require an expanding export base from which investment may be financed and foreign exchange provided for modernization of the economy.

During the first twenty years of transition, moreover, success has a component of balanced growth of both agriculture's and industry's export orientation. While the initial launching of industrialization must be made from the traditional agricultural export base, diversification of this base is needed to accelerate the growth of export profits and domestic investment, particularly in economies beginning from a low

export orientation. As industrial growth proceeds, however, the most critical criterion of success becomes progress in raising the industrial sector's export orientation. We have seen that import substitution growth eventually exhausts the domestic market, and continued growth of the new industries requires penetration of export markets. Moreover, rapid industrialization requires the introduction of industrial exports if the economy's overall export orientation, q, is not to fall as a result of the shift effect. Thus, over the course of the first two decades of transition, we consider success to be associated with increasing the agricultural sector's export orientation (where the original level is too low to initiate growth) or maintenance of the level of agricultural export orientation inherited from colonialism (where the initial level is adequate to launch growth)--combined with raising the industrial sector's export orientation.

4. APPLICATION OF PERFORMANCE MEASURES

In this section we apply the two basic performance measures developed in Section 3 (the income expansion equation and the export orientation equation) to a selected group of open, dualistic economies. This application is undertaken to provide an assessment of relative success, in terms of long-run growth accomplishments, achieved by a relatively large number of countries, including those upon which our own

empirical work focusses. This allows us to view the performance of countries against which our theory was empirically tested (the Philippines, Thailand, Taiwan, and Malaysia) from the perspective of a larger sample of economies of similar type. Selection of open, dualistic economy countries for this purpose was based mainly upon the availability of data to implement the performance measures satisfactorily.[34] In practice, this means that application covers those countries for which the required product, export and employment data were available to provide a sufficient number of annual observations to justify our application of the essentially historical approach to performance.[35]

Use of less-developed country data always warrants emphasis upon problems of reliability and accuracy, particularly when the data are utilized for assessing comparative performance. The difficulties of accurate deflation of current price product series for constant price estimates in the general situation of meager price series, for example,

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[34] It is believed that the performance measures could be applied to many more countries if intensive data work in the countries were possible. In addition to generally available sources (e.g., United Nations publications), AID was consulted on data availability. The major data barriers proved to be sector employment series and data for disaggregating exports between agricultural and nonagricultural.

[35] Sixteen countries for the income expansion equation and nineteen for the export orientation equation.

are well known. Measurement concepts for almost any economic variable are likely to differ among countries. For this reason, we have relied, wherever possible, upon United Nations data, hoping that minimum standards of uniformity have been imposed. Nevertheless, it is inevitable that serious errors reside in some, if not many, of the statistical series used. This implies that the results of our performance measures should be received with considerable reservation, particularly for those countries in which we have not had the opportunity to undertake intensive empirical work (as we did in the cases of the Philippines, Thailand, and--to a lesser extent--China: Taiwan). In general, however, the measures indicate very wide differences in performance and these may be taken as rough indications of real differences among the countries to which the performance measures have been applied.

4.1 LABOR PRODUCTIVITY AND ITS COMPONENTS

A modified form of the income expansion equation (Equation 4a) was applied to sixteen countries with open, dualistic economies. Data on unemployment were found for only a handful of countries so the equation was applied omitting the employment effect term, using the equation in the following form:

$$10) \quad \eta_g = C_y\eta_h + C_x\eta_p + \eta_\Theta\Theta/g(h - p)$$

where, as defined previously, $g = (X + Y)/L'$ (productivity of employed labor)

In this form, the three terms on the right-hand side may be construed, respectively, as the weighted nonagricultural sector's contribution $(C_y\eta_h)$ to the economy's change in labor productivity; the weighted agricultural sector's contribution $(C_x\eta_p)$; and the effect upon labor productivity of labor reallocation from agriculture to industry $[\eta_\Theta\Theta/g(h - p)]$.

Basic data required for applying Equation 10 to a particular country consists of four series: agricultural output, nonagricultural ("industrial") output, agricultural employment, and nonagricultural employment. For the sixteen countries to which the equation was applied, time series estimates were made covering all years of the postwar period for which all four basic series were available. All output data are value added estimates in constant prices, the base years inevitably varying according to individual country procedures.

We begin by scrutinizing the results as annual averages for the entire time series covered for each country. The number of observations shown in Table I varies from 9 (years) for Peru to 15 (years) for several

countries.[36] The averages presented in Table I are the rate of change of economy-wide labor productivity and the three components into which it is decomposed by Equation 10; i.e., the nonagricultural sector contribution, the agricultural sector contribution, and the labor productivity change associated with reallocation of labor from agriculture to industry.

Economy-Wide and Sectoral Productivity Gains

The sixteen countries shown in Table I are listed in the order of their average rates of growth of economy-wide labor productivity. From this listing, we observe considerable variation in performance at this aggregate level, varying from an average gain in labor productivity of .066 per year for China: Taiwan to .017 for Guatemala. The four countries used for intensive empirical testing in other parts of this study rank first (Taiwan, .066), fifth (Malaysia, .041), sixth (Thailand, .038), and thirteenth (Philippines, .022) in average labor productivity gains. According to this aggregate measure of growth

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[36] An attempt was made to begin the country series with 1950, but not earlier, to avoid distortions from the rehabilitation period following World War II which affected many countries, particularly those in Southeast Asia.

TABLE I

LABOR PRODUCTIVITY AND COMPONENTS:
AVERAGE ANNUAL GROWTH RATES

Country	Period	Labor Productivity (1)	Components: Non-Agric. (Industrial) Productivity (2)	Components: Agric. Prod. (3)	Components: Allocation Effect (4)
Taiwan	1951-66	.066	.044	.015	.007
Puerto Rico	1953-66	.063	.049	.005	.009
Jamaica	1954-65	.057	.051	.003	.003
Israel	1950-65	.050	.042	.006	.002
Malaysia*	1955-67	.041	.024	.012	.005
Thailand	1951-65	.038	.021	.011	.006
Panama	1951-65	.037	.026	.008	.003
Ecuador	1951-65	.035	.032	.006	-.003
Mexico	1953-65	.034	.022	.006	.006
Venezuela	1951-65	.034	.021	.003	.010
Peru	1955-64	.030	.020	.005	.005
Ceylon	1950-60	.024	.011	.012	.001
Philippines	1950-65	.022	.016	.003	.003
Chile	1953-65	.022	.019	.001	.002
Colombia	1953-65	.019	.010	.006	.003
Guatemala	1951-65	.017	-.003	.005	.015
Average		.037	.025	.007	.005

*West Malaysia only.

Source of basic data: UN, Yearbook of National Account Statistics and ILO, Yearbook of Labour Statistics, supplemented, where necessary, by country data.

performance, therefore, our case study countries include one high-growth country, two moderately high-growth countries, and one relatively low-growth country--on the basis of the records of the limited group of countries to which the income expansion equation could be applied.

In general, the major components of the change in economy-wide labor productivities are the weighted labor productivity contributions of one or both of the two dualistic sectors, agriculture and nonagriculture. A first question in this connection (deriving from our growth accomplishment criteria discussed previously) concerns the balance of productivity gains between the two sectors. We have considered some degree of labor productivity gains in both sectors as a measure of relative success in launching the transition. Any choice of minimum rates of sectoral productivity growth to meet this criterion is arbitrary. In view of the greater difficulties in raising labor productivity in agriculture than nonagriculture, especially during the first generation of the transition, we consider "success," from the viewpoint of balance, as those cases in which labor productivity in agriculture is raised by at least one-half of one per cent (.005) per year

and in nonagriculture by at least two per cent (.02) per year.[37] This provides a minimum balance between expansion of productivity in the two sectors.

Diagram 2 is a scatter diagram of the sixteen countries, with average productivity gains in nonagriculture on the vertical axis and average productivity gains in agriculture on the horizontal axis. The nine countries in the circle fall within the conditions specified as success in terms of balanced productivity growth. These countries are Taiwan, West Malaysia, Thailand, Panama, Puerto Rico, Israel, Ecuador, Mexico, and Peru. One country, Jamaica, shows high composite productivity gains (.057, as shown in Table I) but fails to meet the present criterion of balanced sectoral productivity growth in view of lagging performance in agriculture (.003). Peru falls on the minimum for both sectors (2.0 per cent for nonagriculture and .5 per cent for agriculture).

Similar to its labor productivity performance at the economy-wide level, China: Taiwan shows the best performance on the balance criterion (4.4 per cent for nonagriculture and 1.5 per cent for agriculture)

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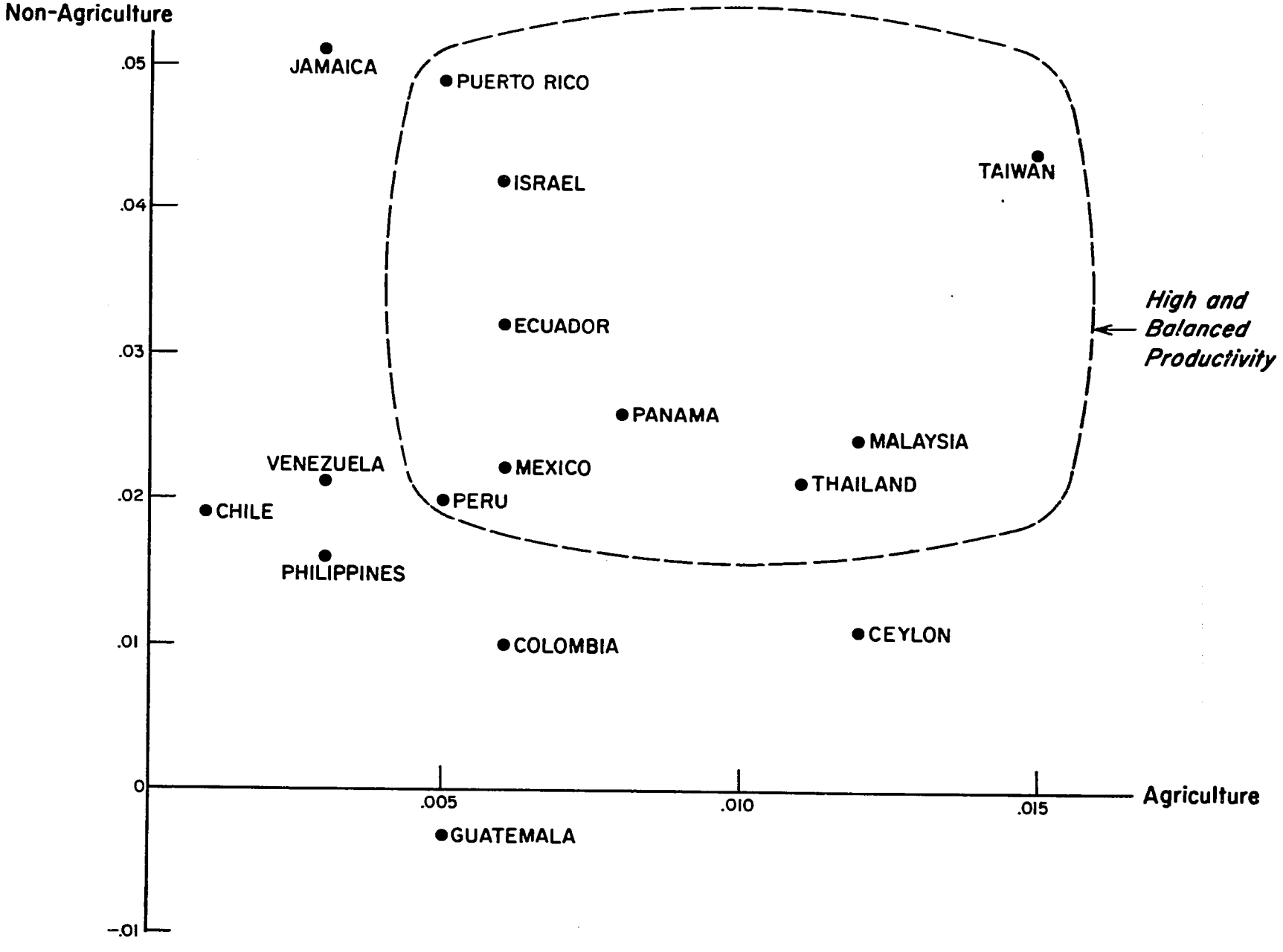
[37]These rates are both slightly below the average sectoral labor productivity performance for the sixteen countries; i.e., .025 for nonagriculture and .007 for agriculture.

Diagram 2: Sectoral Labor Productivities: Average Growth Rates



if balance is defined as relatively high growth in both sectors. Only three other countries showed average rates of productivity gains in agriculture exceeding 1.0 per cent, Malaysia, Thailand, and Ceylon. Malaysia and Thailand performed adequately on productivity gains in nonagriculture (2.4 and 2.1 per cent, respectively) while Ceylon did not (1.1 per cent).

In Jamaica, Venezuela, Ceylon, Colombia, Guatemala, and Chile productivity growth was unbalanced, clearly biased toward nonagriculture (Jamaica, Venezuela, and Chile) or agriculture (Ceylon, Colombia, and Guatemala). In the Philippines, productivity growth appears somewhat biased toward nonagriculture and also below the minimum rates considered as successful in both sectors. All of these biased productivity growth cases may be construed as failure cases on the basis of our a priori thinking in Section 3.3.

Another important aspect of the labor productivity criterion from the growth accomplishment viewpoint is the trend of labor productivity growth, at both the economy-wide and sector levels. In the context of the long-run transition to the modern growth epoch, gradual acceleration of labor productivity growth is an essential component of success. In the generation time horizon, we expect, a priori, the successful launching of transition growth to be reflected in rising labor

productivity trends in both major sectors and, hence, in the composite measure as well. If satisfactory productivity growth rates existed at the beginning of the period, success may be defined in terms of roughly maintaining the initial rates.

Time series regressions were computed for the three labor productivity trends (aggregate, agricultural, and nonagricultural) for each of the sixteen countries shown in Table I.[38] The results of these regressions are presented in Tables II (Composite Labor Productivity), III (Nonagricultural Labor Productivity), and IV (Agricultural Labor Productivity).[39] It is apparent from scrutiny of the three tables that clear trends in productivity growth, aggregate and for the two sectors, exist for very few of the sixteen countries--as indicated by the generally low values of r^2. Moreover, in most cases, the b coefficient is not significantly non-zero. These results must be regarded as particularly poor in view of the serial correlation implicit in the use of moving averages. Annual data would undoubtedly have produced even less significant results.

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[38]The regressions were of the normal form, $\eta = a + bt$, where η is a three-year moving average of the annual productivity growth rate, "a" is a regression constant, and "b" is the regression coefficient.

[39]Countries are arranged in the same order as in Table I.

TABLE II

TIME SERIES REGRESSION:
COMPOSITE LABOR PRODUCTIVITY

	a	b	r^2	n
Taiwan	.02522	.00396	.69	15
Puerto Rico	.07084	- .00123	.65	12
Jamaica	.09217	- .00592	.35	11
Israel	.03993	.00152	.46	14
Malaysia	.02423	.00251	.59	12
Thailand	.02970	.00110	.47	14
Panama	.02176	.00198	.65	14
Ecuador	.04599	- .00145	.45	14
Mexico	.04780	- .00211	.43	12
Venezuela	.05617	- .00303	.27	14
Peru	.05861	- .00564	.05	9
Ceylon	.02321	- .00034	.09	10
Philippines	.05318	- .00330	.18	16
Chile	- .00600	.00428	.31	12
Colombia	.02549	- .00090	.46	12
Guatemala	- .02281	.00512	.50	14

TABLE III

TIME SERIES REGRESSION:
NONAGRICULTURAL SECTOR LABOR PRODUCTIVITY

	a	b	r^2	n
Taiwan	.03738	.00080	.63	15
Puerto Rico	.08025	- .00487	.44	12
Jamaica	.08709	- .00600	.31	11
Israel	.03775	.00055	.36	14
Malaysia	.01135	.00191	.40	12
Thailand	.01463	.00086	.22	14
Panama	.00519	.00275	.48	14
Ecuador	.03314	- .00002	.64	14
Mexico	.02854	- .00095	.43	12
Venezuela	.04142	- .00278	.12	14
Peru	.05207	- .00644	.01	9
Ceylon	.01644	- .00092	.04	10
Philippines	.03121	- .00160	.18	16
Chile	- .00501	.00368	.28	12
Colombia	.00969	.0005	.28	12
Guatemala	- .02598	.00307	.02	14

TABLE IV

TIME SERIES REGRESSION:
AGRICULTURAL SECTOR LABOR PRODUCTIVITY

	a	b	r^2	n
Taiwan	.01924	- .00058	.17	15
Puerto Rico	.00548	- .00009	.11	12
Jamaica	.00207	.00008	.17	11
Israel	.00518	.00017	.13	14
Malaysia	.00707	.00069	.71	12
Thailand	.00992	.00010	.08	14
Panama	.01259	- .00042	.09	14
Ecuador	.01588	- .00136	.01	14
Mexico	.01314	- .00114	.07	12
Venezuela	.00238	.00011	.72	14
Peru	.01012	- .00096	.04	9
Ceylon	.01425	- .00045	.11	10
Philippines	.02198	- .00204	.0005	16
Chile	- .00238	.00050	.05	12
Colombia	.00887	- .00046	.24	12
Guatemala	- .00181	.00097	.30	14

In practice, these results mean that in most of the sixteen countries behavior of labor productivity was very erratic, exhibiting severe annual fluctuations. Nevertheless, as visual inspection of the annual series confirms, the linear regression line may be construed as the most probable fit of any linear function describing trend. In some cases (e.g., the Philippines), a splitting of the period under observation would yield better results.

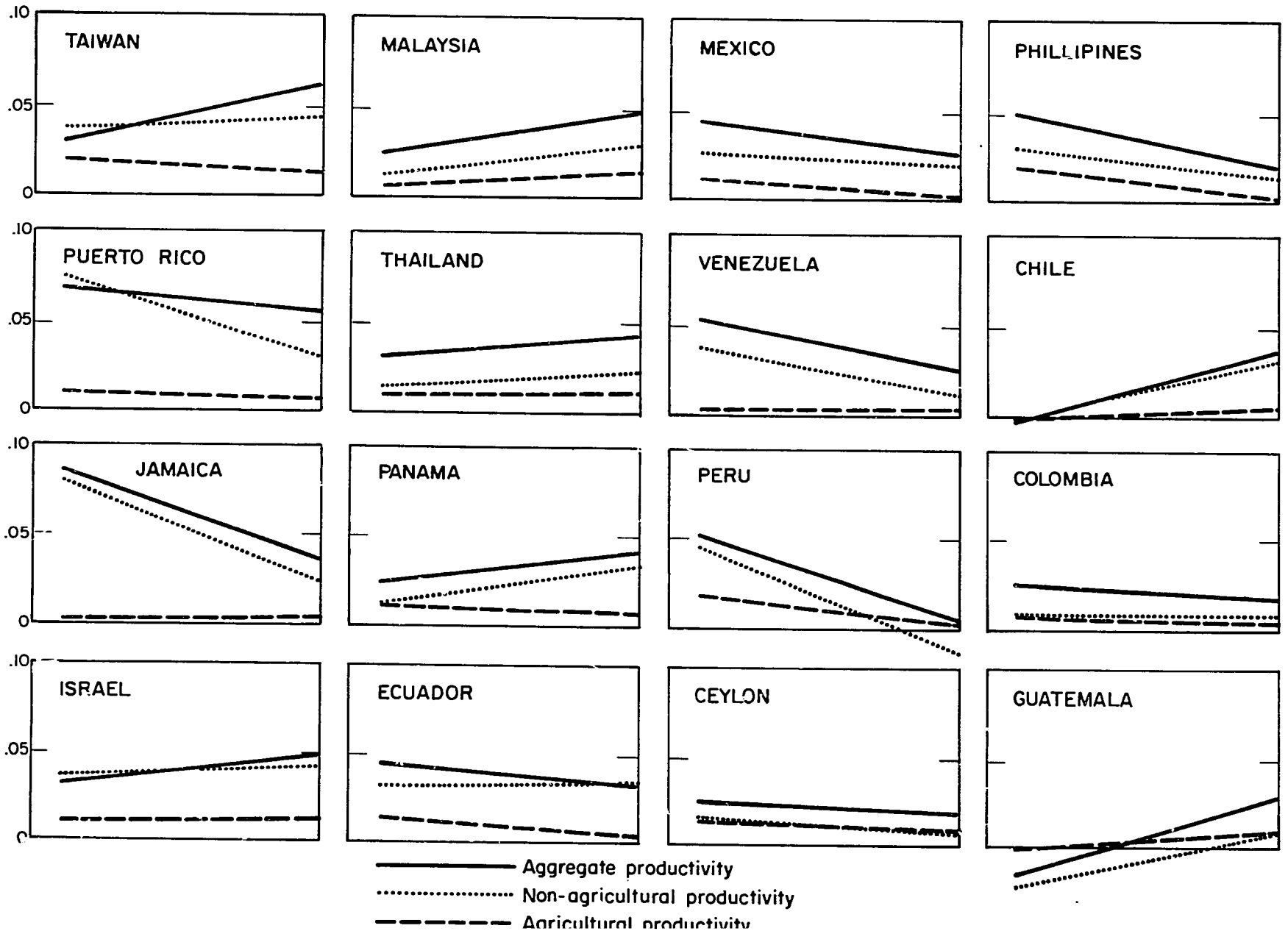
The regression lines for aggregate, nonagricultural, and agricultural productivity growth are plotted for each country in Diagram 3. These may be used as rough indicators of relative degrees of success achieved by the sixteen countries with respect to the level and trend of aggregate and sectoral productivity growth rates. Significant r^2 results and positive "b" or trend values for aggregate productivity were found for Taiwan, Panama, Malaysia, Guatemala, Israel, and Thailand. All of these, with the exception of Guatemala, showed a positive rate of growth of aggregate labor productivity at the beginning of the period and varying rates of acceleration (shown by the value of the b coefficient) during the period. Guatemala showed a negative rate of aggregate productivity growth at the beginning of the period and gradual acceleration to a fairly satisfactory positive rate. One other country, Chile, shows a positive trend beginning from aggregate labor productivity

growth near zero and rising rapidly over the period. In this case, however, the value of r^2 is not significant, and the annual data confirm severe fluctuations in the value of η_g, aggregate labor productivity.

Significant r^2 results associated with negative trend ("b") values for aggregate labor productivity were found for Puerto Rico, Mexico, Colombia, and Ecuador. Venezuela, Peru, the Philippines, and Ceylon show a negative trend with r^2 values of low significance. All countries showing negative trends for aggregate labor productivity growth may be construed as relatively unsuccessful. Falling aggregate productivity growth rates were particularly sharp in the case of Peru, Jamaica, the Philippines, and Venezuela, as may be seen from the size of the negative b coefficients for these countries and the slopes of the regression lines in Diagram 3.

In general, significant values of r^2 for sectoral labor productivities were even less frequent than in the case of aggregate productivity. For the nonagricultural sector, significant values of r^2 were found for Taiwan (positive trend), Ecuador (negative trend), Panama (positive trend), Puerto Rico (negative trend), Mexico (negative trend), Malaysia (positive trend), and perhaps Israel (positive trend). Other countries showing a positive trend, but with low r^2 values, are Chile, Colombia, Guatemala, and Thailand. Countries

Diagram 3: Trends in Productivity Growth Rates: Aggregate, Non-Agricultural and Agricultural



with a low r^2 value and showing a negative trend are Peru, Jamaica, Venezuela, the Philippines, and Ceylon.

For the agricultural sector, only Venezuela and Malaysia show positive productivity trends with significant r^2 values. Other positive trend countries (but low r^2 values) are Jamaica, Chile, Israel, Guatemala, and Thailand. All countries showing negative trends for agricultural productivity had low r^2 values: Peru, Puerto Rico, Mexico, Colombia, Panama, Ecuador, Taiwan, the Philippines, and Ceylon.

To make an overall judgment on relative degrees of success achieved on the productivity trend criterion, several aspects must be kept in mind. These include initial and terminal values for all three productivity growth rates, rate of acceleration or deceleration (indicated by the value of the b coefficient), and stability of growth trends (as indicated by the values of r^2). On the basis of these criteria, five countries stand out as successful: Taiwan, Malaysia, Israel, Guatemala, and Panama. A sixth, Thailand, approaches success at the aggregate productivity level but shows little stability in sectoral productivity growth trends. Among the remaining countries, which all fail to show success on these criteria, a few distinctions stand out. In the case of Peru, all three labor productivity growth rates fell to near or below

zero with very erratic behavior, reflecting the clearest case of unsatisfactory productivity growth rate trends. Both aggregate and nonagricultural growth rates, though beginning from an unusually high level, showed a regression coefficient of b = - .006. Venezuela showed a relatively rapidly falling (b = - .003) aggregate productivity growth trend, accounted for largely by a decline in the nonagricultural sector. The Philippines also showed a quite rapidly falling (b = -.003) aggregate productivity growth trend, accounted for by declining productivity growth in both sectors, particularly in agriculture.

One other point merits emphasis. The productivity growth trends, b, of the nonagricultural and agricultural sectors for the sixteen countries show a relatively high degree of correlation. The coefficient of correlation (ρ = .661) indicates a significant degree of interrelation in the productivity trends for the two dualistic sectors. This general result confirms the significance of our balanced growth criterion, as discussed in Section 3.3. Biased productivity growth of one sector, as we hypothesized, tends eventually to be depressed toward the rate of productivity growth in the lagging sector. Several of the country trends for the sectoral productivity growth rates (shown in Diagram 3) may be interpreted in this light, particularly those of Jamaica, Peru, Puerto Rico, and the Philippines.

Labor Reallocation Effect

The contribution of labor reallocation (from agriculture to nonagriculture) to the economy's composite labor productivity performance is based upon productivity differentials between the two sectors. Thus, the total effect depends on both the rapidity of labor reallocation and the magnitude of the difference in labor productivity between agriculture and nonagriculture. In the income expansion equation (Equation 8), the rate of reallocation is given by η_θ and the sectoral productivity difference, by the expression (h - p). Where both components are relatively large, labor reallocation may make significant contributions to the economy's productivity gains. This contribution is shown for the sixteen countries in Table I, Column 4.

We have argued in Section 2 that reallocation of labor is a significant long-run growth accomplishment in the dualistic economy, though its pace may be affected by openness. In Section 3.3 we deduced certain conclusions about the determinants of the rapidity of labor reallocation. The contributions from labor reallocation to productivity growth (shown in Table I) should be interpreted in light of this earlier discussion.

For the sixteen countries, the average annual contribution of the allocation effect to the economy's productivity gains was .005; i.e., one-half of one per cent per year. The contribution was negative in only one case, Ecuador. Relatively large positive average contributions from reallocation were made in Taiwan (.007), Puerto Rico (.009), Venezuela (010), and Guatemala (.015).

The negative result for Ecuador is not particularly surprising. Our reasoning in Section 3.3 indicates that reallocation is inhibited by rapid gains in industrial productivity accompanying slow progress in raising agricultural productivity. Similarly, the phenomenon of Guatemala's showing the largest allocation effect while ranking last in aggregate productivity gains[40] is consistent with our a priori thinking since Guatemala is also the only country with a negative productivity growth rate in the nonagricultural sector. Equation 5f in Section 3.3 implies that this would tend to induce more rapid reallocation of labor than where nonagricultural productivity is rising.

To facilitate further discussion, Table V shows the basic components of the labor allocation effect for the sixteen countries,

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[40]Guatemala is the only country in which the allocation effect is the dominant component in the aggregate productivity growth rate.

TABLE V

Labor Force Fraction Employed in Nonagriculture, Rate of Growth, and Disparity in Labor Productivity

	(1)		(2)	(3)
	Fraction of Labor Force θ			
	(a) Beg.	(b) End	η_θ (Average)	h/p (Average)
Taiwan	.38	.47	.014	3.55
Puerto Rico	.69	.86	.016	2.50
Jamaica	.60	.64	.005	4.17
Israel	.84	.87	.003	1.53
Malaysia	.41	.48	.012	2.71
Thailand	.22	.26	.012	5.21
Panama	.51	.56	.007	2.47
Ecuador	.50	.43	- .011	1.92
Mexico	.43	.49	.009	4.83
Venezuela	.60	.70	.012	7.04
Peru	.48	.52	.009	3.83
Ceylon	.39	.44	.014	1.27
Philippines	.38	.41	.003	2.90
Chile	.71	.74	.004	2.88
Colombia	.47	.53	.010	1.81
Guatemala	.25	.35	.026	5.35
Average	.49	.55	.009	3.37

as well as the fraction of the labor force employed in nonagriculture at the beginning and end of the observation period (Columns 1a, b). Column 2 shows the rate of change in the fraction of employed labor force in nonagriculture, η_θ, and Column 3, the ratio of labor productivity in nonagriculture to labor productivity in agriculture (h/p).

The uniqueness of Guatemala's result, in which labor reallocation is the dominant component of labor productivity growth, can now be analyzed somewhat further. In addition to beginning with the second lowest value of θ (the fraction of the labor force employed in nonagriculture) which, together with the low rate of nonagricultural productivity growth, helps to explain the high rate of labor reallocation, η_θ, Guatemala has an unusually high (average) disparity between labor productivity in nonagriculture and agriculture, with h/p = 5.35. Similarly, the relatively high reallocation effect for Venezuela, given its low ranking in aggregate productivity growth, may also be analyzed. With a rate of labor reallocation (η_ρ = .012) somewhat above average, Venezuela showed a sizeable reallocation effect, mainly because of the very large average disparity in labor productivity between the two sectors (h/p = 7.04), the largest disparity for the sixteen countries by a wide margin.

In our analysis of productivity criteria in Section 3.3, we stressed the conclusion that, for a closed dualistic economy, significant labor reallocation can occur if, and only if, relatively high increases in labor productivity in agriculture are sustained. We argued, however, that in the case of an open economy, labor reallocation may be partially or completely postponed if the economy is so externally oriented that the Engel's Law effect is taken out through external trade (rather than through internal adjustment via reallocation). Nevertheless, we concluded that eventual domestic adjustment through labor reallocation was inevitable as growth proceeds.

These predictions appear to be confirmed by the data from the sixteen open, dualistic economies. The rate of growth of the fraction of the labor force employed in nonagriculture averaged almost one per cent (.009) per year for our sample, and only one country (Ecuador) failed to show positive reallocation. In other words, we see very little evidence of the impact of openness in postponing this internal adjustment to Engel's Law. There was considerable disparity in rates of reallocation, however, but, generally speaking, these differences can be explained by our major hypothesis that the rate of reallocation is closely associated with the growth of labor productivity in agriculture. Excepting Ecuador, countries showing low rates of labor reallocation

were either those already showing a high fraction of employed labor in nonagriculture (e.g., Israel) or those showing very low rates of growth of labor productivity in agriculture (e.g., the Philippines, Chile, and Jamaica).

The hypothesis that the pace of labor reallocation is significantly controlled by the rate of growth of agricultural productivity was explicitly tested by measuring the correlation between the rate of labor reallocation, η_Θ , and the (weighted) rate of growth of labor productivity in agriculture, $C_x \eta_p$, in 12 countries. Omitting the three countries already cited as special cases (Ecuador, Guatemala, and Venezuela) as well as Puerto Rico,[41] the correlation coefficient, ρ, between η_Θ and $C_x \eta_p$ for the remaining 12 countries was found to be .863--a clearly significant value. Thus, the association we hypothesized (in Section 3.3) between balanced growth (in the sense of minimum gains

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[41] Ecuador showed negative labor reallocation and was thus excluded. The possibility that this reflected the external adjustment mechanism (see Section 3.3) was not investigated. Guatemala's atypically rapid rate of labor reallocation was attributed to the special feature of the negative growth rate of nonagricultural productivity. Venezuela is legitimately excluded on the basis of its representing a special case of a petroleum, enclave economy, and Puerto Rico is excluded on the presumption that its special relationship with the United States and its existing relatively high productivity in agriculture explain deviation from the relationship being tested for other open, dualistic economies.

in agricultural labor productivity accompanying rapid gains in nonagriculture) appears to be substantiated by the typical experience of open, dualistic economies in the postwar generation time span.

General Evaluation of Productivity Performance

The income expansion equation (Equation 8) was applied to time series data for sixteen open, dualistic economies. In the discussion of these results, several aspects of the countries' performance from the viewpoint of long-run growth accomplishments have been introduced. The basic performance criteria have been concerned with the rate, stability, and trend of the growth of labor productivity and its balance between the dualistic sectors, agriculture and nonagriculture. A related criterion, associated with the productivity contribution from labor reallocation, has also been considered. We now attempt to combine these various aspects of country performance to arrive at a synoptic judgment of relative success in fundamental growth accomplishments measured by the income expansion equation. This assessment is made to compare the performance of countries upon which our detailed transition analysis focusses with a larger sample of countries with open, dualistic economies.

An index was developed to give equal weight to the performance of countries on each of the productivity-related criteria. The country performance was measured on a 0 to 1.00 scale for each of seven components: (1) average rate of aggregate productivity growth, (2) average rate of nonagricultural productivity growth, (3) average rate of agricultural productivity growth, (4) trend of aggregate productivity growth (as measured by the value of b in the regression equation), (5) stability of the aggregate productivity growth rate (as measured by the value of r^2 in the regression equation), (6) sectoral balance of productivity growth (as measured by deviation from the average ratio of nonagricultural to agricultural productivity growth $[C_y \eta_h / C_x \eta_p]$ for the sixteen countries), and (7) labor reallocation (as measured by the terminal year fraction, Θ, of the labor force employed in nonagriculture and the average rate of growth of Θ, η_Θ).[42] For all but two criteria (trend and sectoral balance), country performance was rated on the 0 to 1.00 scale by valuing the best performance as 1.00 and locating remaining countries as a percentage of the best performance.[43]

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[42] As defined earlier, $\Theta = W/L'$ where W is employment in nonagriculture and L' is total employed labor.

[43] This gives only one negative number; i.e., for nonagricultural productivity performance for Guatemala.

For trend and balance criteria (to avoid large negative numbers which would distort the equal weighting of criteria), the best country performance was rated as 1.0 and the poorest as 0, and the other countries located accordingly. These results were then combined into the general index by equally weighting performance on each criterion.

The results of applying this productivity-growth index are presented in Table VI which shows both the value of the index for each country (Column 1) and the country's relative performance on each component (Columns 2-8) in the index. Countries are ranked in the order of the value of the general index. This ranking may be interpreted to measure relative performance on the several growth accomplishment characteristics included in the index. Implicit in this ranking is the assumption that relative performance should be assessed in terms of standards set by economies of similar type.

In interpreting the general index results, it should be borne in mind that a country value of 1.00 would denote the best performance on all of the seven components in the index. The highest value shown is .894 (Taiwan) and the lowest, .362 (Philippines). The eight countries with index values above .50 (Taiwan, Puerto Rico, Malaysia, Panama, Israel, Thailand, Mexico, and Ecuador) may be considered relatively successful in productivity growth accomplishments, with degree of

TABLE VI

PRODUCTIVITY GROWTH INDEX

Rank	Country	(1) Index	(2) Aggregate Productivity	(3) Nonagricultural Productivity	(4) Agricultural Productivity	(5) Trend	(6) Stability	(7) Balance	(8) Allocation
1	Taiwan	.894	.143	.123	.143	.128	.143	.137	.077
2	Puerto Rico	.716	.136	.137	.048	.061	.135	.085	.114
3	Malaysia	.698	.089	.067	.114	.109	.122	.128	.069
4	Panama	.671	.080	.073	.076	.102	.135	.140	.065
5	Israel	.665	.108	.118	.057	.096	.095	.111	.080
6	Thailand	.615	.082	.059	.105	.091	.097	.127	.054
7	Mexico	.539	.074	.062	.057	.049	.089	.143	.065
8	Ecuador	.502	.076	.090	.057	.058	.089	.127	.005
9	Colombia	.483	.041	.028	.057	.065	.096	.125	.071
10	Guatemala	.482	.041	- .008	.048	.143	.104	.054	.100
11	Ceylon	.481	.052	.031	.114	.072	.019	.118	.075
12	Venezuela	.457	.074	.059	.029	.037	.056	.111	.091
13	Jamaica	.452	.123	.143	.029	-	.072	.019	.066
14	Peru	.389	.065	.056	.048	.004	.010	.139	.067
15	Chile	.379	.048	.053	.010	.132	.064	-	.072
16	Philippines	.362	.048	.045	.029	.034	.037	.127	.042

success given by the particular value of the index. For several of the remaining--or less successful countries--index values showed little spread: Colombia, .483; Guatemala, .482; Ceylon, .481; Venezuela, .457; and Jamaica, .452. For these countries the differences are hardly significant, but, for all, their productivity performance falls significantly below the first eight countries.

It will be noted that the productivity index alters country rankings from Table I, where countries are ranked only on the basis of aggregate productivity performance. Underlying these changes in rank are discrepancies between rates of growth of aggregate productivity and performance on sectoral productivity growth, trend, stability, and balance, as well as allocation. In general, countries which showed rapid but industrially biased productivity growth fell to a lower ranking in Table VI, where the additional factors were included. Jamaica, for example, fell from third to thirteenth in rank although her average rate of productivity growth was .057 per year. Jamaica showed the worst performance of the sixteen countries on productivity growth trend, and her performance on agricultural productivity and balance was well below average. Similarly, Venezuela, the Philippines, and Chile fell to lower rankings because of weak performance on agricultural productivity and other criteria on which development with a sharp

nonagricultural bias inevitably produced relatively poor performance. In contrast, Guatemala moved from last rank on the basis of aggregate productivity growth in Table I to tenth in Table VI, primarily because of excellent performance on trend (on which she ranked first), stability of productivity and allocation criteria.

Three of the four countries on which the analysis of this study concentrates were among the six best performers on the basis of the productivity index: Taiwan (first), Malaysia (third), and Thailand (sixth). The Philippines, however, ranked last. With the exception of the Philippines, therefore, the case study countries emphasized in our theoretical and empirical work (Taiwan, Malaysia, and Thailand) may be considered relatively successful during the postwar transition period from the viewpoint of long-run growth accomplishments. It is significant to observe that all three performed very well on the criteria of agricultural productivity and balance, although--as we learned in earlier chapters--pursuing quite different growth strategies.

Employment

We have noted earlier that the employment effect could not be included in our decomposition of labor productivity gains because of the lack of data on changes in unemployment. Given the importance of the

employment issue as a performance criterion, we offer an alternative measure of progress in the utilization of human resources. Table VII presents, for the sixteen countries, the average annual rates of growth of employment, both aggregate (Column 1a) and by the two sectors, industry (Column 1b) and agriculture (Column 1c), as well as the rate of population growth (Column 2). In Column 3 the difference between the rate of growth of aggregate employment and the rate of growth of population is shown. All country data cover the same period as the estimates for the productivity decomposition in Table I.

The average rate of growth of aggregate employment varies from .054 for Israel to .010 for Jamaica. Surprisingly, both were high growth performers on the labor productivity criterion (countries are presented in order of aggregate labor productivity gains, as in Table I). Among the other countries ranking in the first five on labor productivity gains, China: Taiwan expanded employment at the rate of .020, somewhat below the average (.024) for the sixteen countries; Puerto Rico's rate of .017 was also below average; and Malaysia's .012 was near the bottom. Thus, there seems to be little, if any, positive relationship between the growth of labor productivity and employment.[44]

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[44]Correlations were run for the sixteen countries between aggregate labor productivity and employment, as well as between nonagricultural labor productivity and employment, and no significant results were found.

TABLE VII

EMPLOYMENT (TOTAL AND BY SECTOR) AND POPULATION:
AVERAGE ANNUAL GROWTH RATES

Country	Period	(1) Employment (a) Total	(b) Indus.	(c) Agric.	(2) Pop.	(3) Empl. - Pop. (Col. 1a - Col. 2)	(4) Rank
China: Taiwan	1951-66	.020	.034	.009	.032	- .012	12
Puerto Rico	1953-66	.017	.033	- .041	.015	.002	2
Jamaica	1954-65	.010	.015	.002	.025	- .015	14
Israel	1950-65	.054	.057	.039	.048	.006	1
W. Malaysia	1955-67	.012	.025	.003	.031	- .019	15
Thailand	1951-65	.020	.033	.016	.031	- .011	11
Panama	1951-65	.024	.031	.017	.029	- .005	8
Ecuador	1951-65	.013	.002	.025	.033	- .020	16
Mexico	1953-65	.031	.041	.023	.035	- .004	7
Venezuela	1951-65	.030	.042	.007	.038	- .008	9
Peru	1955-64	.029	.038	.021	.030	- .001	4
Ceylon	1950-60	.022	.036	.013	.025	- .003	6
Philippines	1950-65	.032	.037	.029	.035	- .003	5
Chile	1953-65	.011	.015	.002	.024	- .013	13
Colombia	1953-65	.025	.035	.014	.034	- .009	10
Guatemala	1951-65	.032	.059	.021	.031	.001	3
Average		.024	.033	.0125	.031	- .007	

Source: Population Growth: Computed from midyear estimates from U. N., Demographic Yearbook, 1963, 1968.
Employment Growth: computed from basic data behind Table I.

In fact, several of the better performers on expanding employment were in the bottom half of productivity-gain countries.

As a proxy measure for progress in eliminating unemployment, Column 3 shows the rate of growth of employment minus the rate of growth of population.[45] In Column 4, countries are ranked in regard to employment performance from the result in Column 3. Only three countries increased employment more rapidly than population: Israel (.006), Puerto Rico (.002), and Guatemala (.001). Thus, our prediction in Section 3.3 that the employment contribution to a society's total labor force productivity will appear late in the course of development appears to be verified. It is interesting to observe that Puerto Rico expanded employment opportunities more rapidly than population growth despite showing the only negative rate of employment growth in agriculture. It should be noted, however, that Puerto Rico's rate of growth of population is only .015, held down by rapid emigration. Thus, a relatively low rate of expansion of employment (.017) allowed Puerto Rico to show some slight progress toward eliminating unemployment. Incidentally, there appears to be a strong case for

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[45] The problem with this measure is that labor participation rates typically rise during the course of development.

population control in less-developed countries in these results showing poor general performance on raising employment relative to population growth.

It is also apparent that this task is particularly difficult during the early stages of development where land resources limit the rate of agricultural expansion. Land poor countries (China: Taiwan, Jamaica, and Chile) show very little gains in agricultural employment although Malaysia's case is something of a paradox. Despite relatively abundant land, a high population growth rate, and an agriculture-oriented development policy, Malaysia's expansion of agricultural employment (.003) was near the bottom. This result is probably explained by the large agricultural plantation sector's shift toward more capital-intensive methods of production. In other countries, however, expanding agricultural employment occurred despite very low labor productivity gains in agriculture. In the Philippines, agricultural employment grew by .029 while agricultural productivity rose by .003; in Guatemala, agricultural employment expanded at the rate of .021 while agricultural productivity growth was negative (- .003). In the latter two countries (the Philippines and Guatemala), horizontal expansion of agriculture was apparently possible because of favorable land-labor ratios even though development had a clear industry bias and industrial employment was also expanding rather rapidly.

4.2 EXPORT ORIENTATION

The export orientation equation (Equation 9) was applied to nineteen open, dualistic economies, including the sixteen countries covered in our discussion of labor productivity growth in the preceding section.[46] The equation (as we have seen in Section 3.4) is designed to decompose the rate of growth of the economy's overall export orientation, $q = E/(X + Y)$, into three components, the weighted growth of the industrial (nonagricultural) sector's export orientation ($\xi_y = E_y/Y$), the weighted growth of the agricultural sector's export orientation ($\xi_x = E_x/X$), and a shift effect (resulting from changes in product shares between the agricultural and nonagricultural sectors).

Basic data required for applying the equation consist of four series: agricultural output, industrial (nonagricultural) output, industrial (nonagricultural) exports, and agricultural exports. Agricultural exports are defined as those for which the contribution of agricultural value added is greater than that of the nonagricultural sector. The length of the time series employed varies in some cases

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[46] In addition to the sixteen countries (listed in Table I) to which the income expansion equation was applied, this includes Greece, Korea, and Costa Rica.

from that for the productivity decomposition because of data availabilities and--in a few cases--to avoid using erratic years for the initial or terminal values.

Decomposition of the rate of growth of the economy's export orientation into the three components of Equation 9 was undertaken for each year in the country time series. To begin the discussion of results, we introduce Table VIII, which shows the averages of the annual changes in the economy's export orientation and its components over the entire period. The value of the economy's export orientation, q, in the initial and terminal years of each country's series is also shown.

Aggregate Level

Countries are arranged in Table VIII in the order of the magnitude of the average growth rate of the economy's export orientation. Growth rates varied from .136 per year for South Korea to - .034 for Ceylon. Two of the countries upon which our empirical work focusses showed positive growth of export orientation, Taiwan (.053) and Thailand (.032); the other two, negative, Philippines (- .0004) and Malaysia (- .012). Nevertheless, both of the latter countries maintained relatively high export orientation, particularly

TABLE VIII

EXPORT ORIENTATION AND COMPONENTS: AVERAGE ANNUAL GROWTH RATES

Country	Period	Export Orientation (E/GNP)			Components of Growth		
		Beginning	End	Average Growth Rate	Nonagricultural	Agricultural	Shift Effect
Korea (Republic of)	1953-66	.020	.113	.136	.082	.053	.001
Israel	1952-65	.084	.192	.081	.060	.024	- .003
China: Taiwan	1951-67	.120	.240	.053	.036	.012	.005
Peru	1953-64	.176	.248	.032	.014	.022	- .004
Thailand	1951-65	.160	.204	.027	.011	.027	- .011
Chile	1953-65	.095	.126	.027	.024	.001	.002
Jamaica	1954-65	.283	.361	.025	.029	.005	- .009
Greece	1953-66	.084	.116	.024	.008	.037	- .021
Guatemala	1953-65	.141	.168	.021	.008	.020	- .007
Ecuador	1951-63	.158	.176	.013	- .003	.020	- .004
Panama	1950-65	.329	.360	.011	.0015	.009	.0005
Puerto Rico	1950-64	.424	.438	.009	.000	.010	- .001
Philippines	1950-65	.204	.197	- .0004	.0034	- .0053	- .009
Venezuela	1951-65	.322	.294	- .005	- .0044	- .0006	.0004
Malaysia*	1955-66	.500	.430	- .012	- .004	- .001	- .007
Costa Rica	1953-64	.288	.242	- .018	.008	.004	- .030
Colombia	1953-65	.242	.184	- .021	.006	- .018	- .009
Mexico	1953-65	.136	.100	- .022	- .014	.000	- .008
Ceylon	1953-66	.360	.226	- .034	- .0037	- .0103	- .020

*West Malaysia only.

Sources of basic data: UN, Yearbook of National Account Statistics, and UN, Yearbook of International Trade Statistics, supplemented where necessary by country data.

Malaysia, with a terminal export orientation of .43. The Philippines' terminal export orientation was .197. In terms of aggregate export orientation performance of the nineteen countries, Taiwan ranked third; Thailand, fifth; the Philippines, thirteenth; and Malaysia, fifteenth.

It is clear from surveying these results at the aggregate level that the growth of export orientation was significantly related to initial magnitude of export orientation. In Table IX, countries are classified by the size of their initial export orientation, q (low, under .10; moderate, .10 - .20; and high, over .20), and the average rate of growth of export orientation (negative; moderate, 0 - .03; high, over .03). It is apparent that countries with low initial export orientation showed better performance on raising export orientation than the other countries. Two of the countries with most rapidly growing export orientation (South Korea and Israel) began with low export orientation, while no country with a high average export orientation growth rate had an initially high export orientation. All countries showing a negative growth rate for export orientation began with a moderate or high initial export orientation, with four of these seven countries beginning from high export orientation.

TABLE IX

INITIAL EXPORT ORIENTATION AND GROWTH OF EXPORT ORIENTATION

Initial Export Orientation	Export Orientation Growth (average rate)		
	Negative	Moderate (0 - .03)	High (over .03)
Low (under .10)		Chile (.027) Greece (.024)	Korea (.136) Israel (.081)
Moderate (.10 - .20)	Philippines (- .0004) Colombia (- .021) Mexico (- .022)	Thailand (.027) Guatemala (.021) Ecuador (.013)	Taiwan (.053) Peru (.032)
High (over .20)	Venezuela (- .005) Malaysia (- .012) Costa Rica (- .018) Ceylon (- .034)	Jamaica (.025) Panama (.011) Puerto Rico (.009)	

In our earlier discussion (Section 3.4) we viewed successful export performance during the first generation of the transition as maintaining a relatively high degree of export orientation or raising the economy's export orientation where the economy begins from a low export orientation. In these aggregate terms, most of the nineteen countries in our sample may be judged as relatively successful. All countries with low initial export orientation in Table IX showed moderate or high aggregate export orientation growth rates. Only two countries with moderate initial export orientation (Colombia and Mexico) showed significantly negative growth of export orientation, while the Philippines came close to maintaining a .20 level of export orientation. Five other countries in this category showed varying degrees of improvement. Among countries beginning with a high degree of export orientation, four of seven countries suffered negative growth rates but, nevertheless, ended the period with relatively high export orientation.

Sectoral Performance

More crucial than export orientation performance at the aggregate level, however, is the export performance of the two dualistic sectors, agriculture and nonagriculture. We have defined (in Section 3.4) success in this connection as maintaining or raising

the agricultural sector's export orientation while significantly raising that of the nonagricultural sector. Table X provides data by sector for evaluating country performance on this score. In addition to reproducing the (weighted) contributions of the nonagricultural (Column 3) and agricultural (Column 6) sectors to the growth of the economy's export orientation, the initial and terminal values for nonagriculture's export orientation (Columns 1 and 2) and agriculture's export orientation (Columns 4 and 5) are shown.[47] Scrutiny of these data confirm that countries showing most success in raising their economy's export orientation (i.e., all of the high growth countries in Table IX: South Korea, Israel, Taiwan, and Peru) relied upon substantially increasing the export orientation of both sectors. These countries, therefore, clearly achieved success in increasing the economy's export orientation by diversifying exports to include an increasingly large nonagricultural component as economic growth shifted the structure of the economy toward nonagriculture. The remaining countries, generally speaking, showed either falling or

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[47]It should be noted that the average growth rates shown in Columns 3 and 6 are weighted by the share of sector output (P_y and P_x) and, hence, average growth rates cannot be calculated directly from the initial and terminal values for sector export orientation.

TABLE X

EXPORT ORIENTATION BY SECTOR: INITIAL, TERMINAL, AND AVERAGE GROWTH CONTRIBUTION TO ECONOMY'S EXPORT ORIENTATION

Country	Nonagriculture: Export Orientation (ξ_y)			Agriculture: Export Orientation (ξ_x)		
	(1) Beg.	(2) End	(3) $p_y \eta_{\xi_y}$	(4) Beg.	(5) End	(6) $p_x \eta_{\xi_x}$
Korea, Republic of	.024	.134	.082	.017	.082	.053
Israel	.051	.149	.060	.332	.636	.024
China: Taiwan	.142	.250	.036	.076	.203	.012
Peru	.111	.145	.014	.380	.628	.022
Thailand	.037	.079	.011	.339	.451	.027
Chile	.105	.136	.024	.029	.041	.001
Jamaica	.210	.319	.025	.311	.674	.027
Greece	.022	.039	.008	.205	.361	.037
Guatemala	.017	.033	.008	.400	.501	.020
Ecuador	.024	.012	- .003	.370	.454	.020
Panama	.383	.356	.0015	.184	.374	.009
Puerto Rico	.426	.415	-	.419	.703	.010
Philippines	.106	.100	.0034	.364	.425	- .0053
Venezuela	.342	.313	- .0044	.096	.043	- .0006
Malaysia	.326	.306	- .004	.589	.563	- .001
Costa Rica	.008	.045	.008	.633	.653	.004
Colombia	.056	.075	.006	.547	.410	- .018
Mexico	.073	.045	- .014	.377	.362	-
Ceylon	.039	.004	- .0037	.632	.543	- .010

stable export orientation for one sector or the other--in some cases, for both. Countries which failed to maintain agricultural sector export orientation include the Philippines, Venezuela, Malaysia, Colombia, and Ceylon. Countries failing to show any progress on the important performance criterion of raising the nonagricultural sector's export orientation (i.e., zero or negative average growth rates) are Ecuador, Puerto Rico, Venezuela, Malaysia, Mexico, and Ceylon.

Progress in raising the export orientation in an open, dualistic economy, therefore, is fundamentally a matter of increasing the exported share of nonagricultural output. Correlation between the rate of growth of export orientation, η_q, for the nineteen countries and the rate of growth of their nonagricultural sector's export orientation, η_{ξ_y}, showed a very significant positive relationship. The coefficient of correlation between these two average growth rates for the nineteen countries was found to be .926.[48]

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[48]A major factor explaining the strong relationship between η_q and η_{ξ_y} is the shift effect, discussed below.

Mineral Versus Manufactured Goods Exports

From the viewpoint of positive growth accomplishments during the postwar transition generation, however, a finer distinction must be made. In several cases, nonagricultural export orientation increased primarily, or largely, because of expansion of mineral exports. Because of their raw material-specific nature, mineral exports reflect less progress in diversifying exports beyond the primary product base than do manufactures. The distinction is particularly important to evaluate the progress made toward providing export outlets for developing domestic manufacturing industry. We have seen in our growth theory chapters that domestic markets for developing consumer goods industries are inevitably terminated by forces within the growth system. Mineral exports may provide temporary postponement of this termination, but they do not solve the fundamental problem of expanding markets for new manufactures beyond the limited potential of the domestic economy.

To evaluate the significance of this distinction and its bearing upon export orientation performance for the countries in our sample, we introduce Table XI. This table shows for all countries in our sample (excepting Puerto Rico) the share of mineral and mineral products in nonagricultural exports for the initial and terminal

TABLE XI

CHANGE IN SHARE OF NONAGRICULTURAL EXPORTS FROM MINERALS AND MINERAL PRODUCTS

Country	Minerals: Percentage of Nonagricultural Exports	
	Initial	Terminal
Korea, Republic of	82.6	23.2
Israel	47.5	36.6
China: Taiwan	5.1	21.6
Peru	100.0	100.0
Thailand	100.0	86.2
Chile	99.7	98.9
Jamaica	85.9	88.5
Greece	44.3	49.0
Guatemala	34.4	0.7
Ecuador	100.0	21.0
Panama	1.8	97.7
Philippines	64.5	72.5
Venezuela	100.0	99.9
Malaysia*	88.0	82.8
Costa Rica	-	3.8
Colombia	94.3	75.9
Mexico	79.8	64.5
Ceylon	66.7	41.7

*West Malaysia only.

Source: UN, Yearbook of International Trade Statistics.

year of the period covered by our export orientation analysis. This information enables us to distinguish countries in which mineral exports dominated nonagricultural sector export orientation from those in which manufactures played a significant role in maintaining or raising the economy's export orientation.

In six of the countries in Table XI (Jamaica, Peru, Thailand, Chile, Venezuela, and Malaysia), exports of mineral products dominated export orientation of the nonagricultural sector throughout the period. For these countries, such changes in nonagricultural export orientation as occurred were explained completely, or mainly, by growth of mineral exports rather than by export of manufactures. In two other countries, Panama and the Philippines, the share of mineral exports grew rapidly enough during the period to explain most of the nonagricultural sector's export orientation performance. In Taiwan, the share of mineral exports grew significantly (from 5.1 to 21.6 per cent) but was accompanied by a rapid increase in the export of manufactures. In seven countries (Korea, Israel, Guatemala, Ecuador, Colombia, Mexico, and Ceylon) the share of mineral exports fell significantly, accompanied by falling export orientation of the nonagricultural sector in Ecuador, Mexico, and Ceylon. In Korea, Israel, and Guatemala the nonagricultural sector's export orientation

grew rapidly, and in Colombia, slightly, despite a falling share of mineral exports. In the two remaining countries, Greece and Costa Rica, changes in the share of mineral exports in nonagricultural exports were not significant in explaining changes in the export orientation of the nonagricultural sector.

Shift Effect

The third term[49] on the right-hand side of the export orientation equation (Equation 9) has been described as the shift effect. Given the export orientation of the two sectors, it measures the effect of shifts in product shares between agriculture and nonagriculture upon the economy's export orientation. Where the degree of industrialization, λ_y, is increasing, this shift effect will be negative (reducing the economy's export orientation) unless nonagricultural exports increase at an appropriate rate. Hence, where industrialization occurs, the economy cannot maintain or increase its export orientation without expanding nonagricultural exports.

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49 $\frac{\eta_{\lambda_y} \lambda y}{q} (\xi_y - \xi_x)$

Very few of the nineteen countries in our sample succeeded in avoiding a negative shift effect upon the rate of growth of export orientation. Only Taiwan showed a significantly positive shift effect (.005), while Chile, Korea, Panama, and Venezuela showed slightly positive values. In Chile, Panama, and Venezuela this achievement is explained by the dominance of mineral exports. Thus, only Taiwan and Korea may be interpreted as achieving a positive shift effect by significantly increasing nonagricultural exports of other than primary product related types.

At the other extreme, countries which suffered the largest depressing shift effects are Costa Rica (- .030), Greece (- .021), Ceylon (- .020), and Thailand (- .011). In these countries the failure of nonagricultural exports to expand as rapidly as the shift in product caused the economy's export orientation to fall by more than one per cent per year--in Costa Rica by as much as 3 per cent. In Costa Rica the economy's export orientation fell (by an average of .018) as a result of this sharply negative shift effect--even though the export orientation of both agriculture and nonagriculture were being slightly raised over the period (see Table X). In this case, expansion of nonagricultural exports failed to overcome the effect of a rapid shift in product toward nonagriculture, as shown by an increase in the value

of λ_y; i.e., Y/(X + Y), from .55 to .69. The other cases of negative shift effects are explainable in similar terms though the impact was less severe than for this extreme case in our sample. In all, negative shift effects occurred in 14 of the 19 countries in our sample, suggesting that industrialization tends to have a depressing effect on export orientation--at least during the early transition experience of open, dualistic economies. Negative shift effects were avoided only where little progress in expanding the nonagricultural share of product occurred (e.g., Venezuela and Panama) or where progress in raising nonagriculture's export orientation (ξ_y) significantly outpaced the growth of agriculture's export orientation (ξ_x)--as in Korea, Taiwan, and Chile.

Export Performance Index

To make a general assessment of performance on export orientation, an index was developed to give equal weight to four export-related growth accomplishments. Country performance was measured on a 0 to 1.00 scale for each of the four components in the index: (1) average rate of growth of the economy's export orientation, η_q; (2) average rate of growth of the nonagricultural sector's export orientation, $p_y \eta_{\xi_y}$; (3) average weight of growth of the agricultural sector's export orientation, $p_x \eta_{\xi_x}$; and (4) the growth of the share of manufactures in

total exports (distinguishing manufactures from other nonagricultural exports; e.g., mineral products). Country performance was valued by assigning the number 1.00 for the best performance on each criterion and 0 for the worst performance. These results were then combined into the general index by equally weighting performance on each criterion. The index value of 1.00 would be equivalent to "best" country performance of all five of the components in the index.

The results of applying this export performance index to 18 countries are presented in Table XII.[50] The general index is given in Column 1, and the four components are shown in Columns 2-5. Countries are ranked in the order of the value of the general index.

With 1.00 as the highest possible result (actually achieved by Korea) on the general index, we observe that only three countries achieved a value exceeding .50 (Korea, Israel, and Taiwan) with Korea's perfect score in performance (1.0) substantially above the other two (Israel [.64] and Taiwan [.57]). All three of these countries began the period with relatively low export orientation (Korea, .020; Israel, .084; and Taiwan, .120). At the other end of the export performance index,

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[50] Puerto Rico is excluded from this index since data were not readily available to measure the growth of the share of manufactures in total exports.

TABLE XII

EXPORT PERFORMANCE INDEX

Rank	Country	(1) Index	(2) Export Orientation	(3) Nonagricultural Contribution	(4) Agricultural Contribution	(5) Export of Manufactures
1	Korea, Republic of	1.000	.250	.250	.250	.250
2	Israel	.640	.169	.193	.148	.130
3	China: Taiwan	.571	.128	.130	.106	.207
4	Greece	.400	.085	.057	.194	.064
5	Thailand	.372	.090	.065	.159	.058
6	Peru	.358	.097	.073	.141	.047
7	Guatemala	.353	.081	.057	.134	.081
8	Jamaica	.327	.087	.112	.081	.047
9	Chile	.307	.090	.099	.067	.051
10	Ecuador	.285	.069	.029	.134	.053
11	Costa Rica	.272	.024	.057	.078	.113
12	Philippines	.220	.050	.044	.046	.080
13	Panama	.201	.066	.040	.095	-
14	Malaysia	.182	.032	.026	.060	.064
15	Venezuela	.178	.043	.025	.060	.050
16	Mexico	.151	.018	-	.064	.069
17	Colombia	.148	.019	.052	-	.077
18	Ceylon	.099	-	.026	.028	.045

four of the bottom five countries (index values below .20) began the period with high export orientation (over .20); this was particularly true for Malaysia (.50) and Ceylon (.39). Thus, our earlier conclusion that performance on export orientation is likely to vary inversely with the initial level of export orientation is further confirmed by the export orientation index.

The index differs from the export orientation equation by omitting the shift effect[51] while adding a measure of success in raising manufactures as a share of total exports--an important growth accomplishment obscured by the disaggregation of exports into only agricultural and nonagricultural when applying the export orientation equation. These changes are intended to emphasize expansion of manufactured exports as a growth performance criterion while discounting growth of extractive (mineral and related) exports. Substitution of manufactured for primary product exports has been emphasized as a growth accomplishment in the earlier section of this chapter, as well as in the chapters concerned with analysis of the transition process.

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[51]The shift effect is omitted since (as implied above) its significance as a growth performance criterion is distorted in economies in which mineral production represents a large share of output and exports.

In general, the export performance index results do not show major differences in country performance rankings from the export orientation growth rates shown in Table VIII. As we would expect, however, countries in which mineral exports dominated the growth of nonagricultural exports showed significantly lower rankings on the export performance index than in Table VIII. This was true of Peru (which fell from fourth to sixth), Chile (which fell from sixth to ninth), Panama (which fell from eleventh to thirteenth), and Venezuela (which fell from thirteenth to fifteenth). Two countries (Greece and Guatemala) showed significant improvements in ranking on the export performance index--Greece as a result of neglecting a strong negative shift effect and Guatemala because of good performance in increasing the share of manufactured exports.

The eighteen countries fall into three groups on the basis of the export performance index: (1) the high performers (.57 - 1.00): Korea, Israel, and Taiwan; (2) moderate performers (.31 - .40): Greece, Thailand, Peru, Guatemala, Jamaica, and Chile; and (3) the weak performers (.10 - .29): Ecuador, Costa Rica, Philippines, Panama, Malaysia, Venezuela, Mexico, Colombia, and Ceylon.

Different groupings (and individual country rankings), of course, would be found on the basis of the four components in the index. Only the three top countries as measured by the general index performed well above average in each of the four components. Thus, these three (Korea, Israel, and Taiwan) were clearly successful in export performance--relative to the sample of eighteen countries.

5. CONCLUSION

In this concluding section we attempt to distill significant conclusions from the two sets of performance results, one emphasizing productivity criteria and the other, export orientation criteria. We also consider the implications of these results for placing our four case study countries in the broader performance perspective of the larger sample of open, dualistic economies discussed in Section 4.

To begin the discussion, we introduce Table XIII which shows for fifteen countries[52] the results of the productivity and export performance indexes and the average of the two, with countries arranged in the order of the value of the average. Scrutiny of this table shows that

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[52]There are only fifteen countries to which both indexes could be applied.

TABLE XIII

PRODUCTIVITY AND EXPORT PERFORMANCE INDEXES AND AVERAGE

Country	Productivity Index	Export Performance Index	Average
China: Taiwan	.894	.571	.733
Israel	.665	.640	.653
Thailand	.615	.372	.494
Malaysia	.698	.182	.440
Panama	.671	.201	.436
Guatemala	.482	.353	.418
Ecuador	.502	.285	.394
Jamaica	.452	.327	.390
Peru	.389	.358	.374
Mexico	.539	.151	.345
Chile	.379	.307	.343
Venezuela	.457	.178	.318
Colombia	.483	.148	.316
Philippines	.362	.220	.291
Ceylon	.481	.099	.290

only two countries showed superior performance on the basis of both indexes (Taiwan and Israel), resulting in averages of the two performance indexes significantly above the thirteen other countries. In looking for unique performance characteristics to explain the superior overall growth accomplishments of these two countries, one fact stands out. Of the fifteen countries in Table XIII only these two achieved significant progress in export substitution; i.e., in substituting manufactured goods exports for primary products during the first generation of the postwar transition. In 1966, export of manufactures represented 47 per cent of total exports from Israel (compared to 30 per cent in the initial year) and 41 per cent from Taiwan (compared to 6 per cent in the initial year). None of the other thirteen countries achieved more than a 15 per cent share of manufactures in total exports by the end of the period, and the average for the thirteen was only 5 per cent.[53] Thus, one conclusion appears clear; superior growth accomplishments on both the dualistic and openness aspects during the first generation of the transition were associated with rapid and substantial progress in raising the share of manufactured goods in total exports. Only moderate success at growth

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[53]All data in this paragraph are based on export composition data from the U. N. Yearbook of International Trade Statistics.

accomplishments (e.g., Thailand, Malaysia, Panama, Guatemala, Ecuador, Jamaica, Peru) can be achieved by maintaining an essentially primary product export base, in some cases accompanied by very slow substitution of manufactures for primary product exports. However, this same export pattern was associated with little success in growth accomplishments in the remaining countries (Mexico, Chile, Venezuela, Colombia, Philippines, and Ceylon).

Some countries showed significant progress on productivity accomplishments while performing poorly on the export criteria. Chief examples are Malaysia, Panama, Mexico, and Colombia. The disparities for Malaysia, Panama, and Colombia can be explained on the basis of the hypothesis that high export orientation economies can show significant productivity gains even though export orientation falls (though we expect a limit). The Mexican case may be explainable by a number of special characteristics--particularly an unusually high rate of foreign capital inflow (counteracting the effect of falling export orientation), and rapid absorption of modern technology (particularly from the United States).

By contrast, two countries--Peru and Jamaica--did considerably better on export performance than on productivity. This is probably explainable on the basis of the continued dominance of

mineral exports in the nonagricultural exports of both countries. Neither country made significant progress in introducing exports of manufactures. Continuation of this enclave phenomenon was apparently inconsistent with diffusion of new technology and other productivity-raising stimuli throughout the economy. Both Jamaica and Peru were particularly weak in achieving labor productivity gains in agriculture and, moreover, both countries showed rapidly declining trends in growth of nonagricultural labor productivity (see Table I and Diagram 3).

To summarize the results of the growth accomplishment measures, we present in Table XIV the fifteen countries to which the two performance indexes could be applied, classified by high success, moderate success, and low success at growth accomplishments measured by the two indexes. The combined (average) index values fall rather clearly into the three groups thus identified. This classification assists in placing our four case study countries (China: Taiwan, Malaysia, the Philippines, and Thailand) in the broader perspective of the growth accomplishments achieved by fifteen countries with open, dualistic economies.

The highest degree of success on the combination (average) of both types of growth accomplishment was achieved by Taiwan. In terms of our transition process analysis, Taiwan has been characterized

TABLE XIV

DEGREES OF SUCCESS: GROWTH ACCOMPLISHMENTS*

High		Moderate		Low	
China: Taiwan	.733	Thailand	.494	Mexico	.345
Israel	.653	Malaysia	.440	Chile	.343
		Panama	.436	Venezuela	.318
		Guatemala	.418	Colombia	.316
		Ecuador	.394	Philippines	.291
		Jamaica	.390	Ceylon	.290
		Peru	.374		

*Countries are classified on the basis of the average of the two performance indexes (productivity growth index and export performance index) discussed in the text.

in that analysis as an economy which moved through three distinct stages during the postwar generation of transition experience. Relative to growth performance in other open, dualistic economies, this growth strategy, culminating in rapid export substitution, must be judged as particularly successful. (We have noted that the same phenomenon of effective export substitution was present in the only other high success country, Israel.)

The two economies characterized in our earlier analysis as the neo-enclave export-led growth type, Malaysia and Thailand, stand at the top of the list of the moderate success countries. This suggests that a generation of transition growth of the neo-enclave type, in which growth continues to be led by primary product exports, is consistent with relatively good performance on growth accomplishments from the long-run viewpoint. Thailand, which pursued an indigenous product-based strategy of export diversification, appears to have been somewhat more successful than Malaysia, which continued the modern export product-based growth strategy it inherited from colonialism--while showing little success at diversification of exports.

Finally, the Philippines, which relied upon a politically pushed industrialization strategy, reinforced by expansion of extractive primary product exports to prolong the duration of this growth system, falls near

the bottom of the low growth accomplishment countries. Prolongation of this growth system beyond its capacity to provide satisfactory transition growth momentum is apparent from falling growth rate trends for labor productivity (aggregate and in both sectors)[54] and retardation of the basic growth force of import substitution.[55]

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[54]See Tables II, III, and IV and Diagram 3.

[55]Evidence for retardation of import substitution can be seen from the fact that domestic supply of finished manufactured goods relative to total availability of these goods grew rapidly during the 1950s but has remained relatively constant since 1959. See Douglas S. Paauw, "The Philippines: Estimates of Flows in the Open, Dualistic Economy Framework, 1949-1965 (Washington: Center for Development Planning, National Planning Association, February, 1968) (mimeo), Table III-45, p. 148.