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1 The Framework of the Country Studies

Anne O. Krueger

This is the first of three planned volumes from the National Bureau of Economic Research project on alternative trade strategies and employment. It presents the major results from ten studies of individual countries' experience with their trade and payments strategy—in particular, the degree of emphasis on export promotion relative to import substitution—and the implications alternative strategies have for employment.

The country studies were undertaken within a common framework. We hope that the comparability among them (though still imperfect owing to data limitations and differences in experience) will add a dimension of interest to the studies. Nonetheless, each country's experience is of interest in its own right. The country findings are designed to "stand alone" in the sense of being self-contained analyses of value for understanding the individual economy.

Two subsequent volumes will explore some of the findings that emerge from systematic evaluation of the experience of the individual countries. The second volume will contain a series of essays on particular aspects of the relationship between trade strategy and employment, while the third will provide an overall analysis of the relationship and of the results of the individual studies viewed all together. The reader interested in a full discussion of the underlying theory or in an interpretation of the comparative results across countries is referred to those volumes.

This chapter will provide background information about the common framework within which the country studies were undertaken, including a few particulars about the history of the project, a sketch of the underlying theory upon which empirical analysis was based, and a definition of the concepts used by all the country authors in carrying out their

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analyses. The purpose is not to provide an extensive review of the theory, but rather to enable this volume to be utilized independently, while avoiding the need for each author to repeat the underlying theory, definitions, and concepts necessary for a statement and interpretation of his results.

1.1 The Project

During the late 1960s and early 1970s, disillusionment with the import substitution strategy and its results was increasing. Contributing to this trend were both the results of research on the effects of the strategy¹ and the remarkable increases in growth rates experienced by some of the countries that had shifted to an export promotion strategy. Simultaneously with that disillusionment, however, came a fundamental questioning of the adequacy of economic growth itself as an objective. Many observers began doubting the degree to which economic growth had resulted in increased employment opportunities and higher living standards for the majority within the developing countries.

A natural question, but one that was not addressed, was the extent to which the unfavorable results with respect to employment and income distribution had themselves originated from the policies adopted to encourage import substitution. Failure to investigate this possible linkage was all the more surprising in light of the implications of the fundamental Heckscher-Ohlin-Samuelson (HOS) model of international trade so widely used in international economics, and the questions that had earlier been raised by Wassily Leontief (1968) in his famous Leontief paradox. For, if the HOS model were valid, and if developing countries were labor-abundant, their failure to encourage export growth would naturally and directly affect the demand for labor. However, findings from empirical studies for a variety of countries following Leontief were not sufficiently uniform and comprehensive to permit any conclusions, and considerable doubt remained about the validity of the HOS predictions.²

Moreover, early evidence from two countries—Brazil and Colombia—that had switched trade strategies suggested that emerging exports might be capital-intensive. Noteworthy in particular was Diaz's conclusion regarding Colombia that "it would be a mistake to assume that all these [nontraditional] exports are made up of labor-intensive commodities."³

The NBER project on alternative trade strategies and employment was designed to analyze the implications for labor markets of alternative trade strategies and also to examine the effect of different institutional arrangements in labor markets on factor proportions in trade. It was felt that if studies were undertaken for a number of developing countries

within a common framework, the results would provide considerable insight into the links between trade strategy choices and the development of employment opportunities.

1.1.1 Project Participants and Procedures

From the outset it was recognized that the project would necessarily entail several phases. The first phase was to provide a formal statement of the empirical implications of a multicountry, multicommodity model of international trade. This was done in Krueger (1977).

The next step was to identify economists knowledgeable about individual countries who would be interested and willing to undertake studies and to develop, in cooperation with those economists, a set of concepts, definitions, and research goals. This was done partly through correspondence, with the aid of a draft working paper, and was completed after a conference of project participants during which the various concepts and definitions discussed in the draft were amended and agreed upon.⁴

The countries, country authors, and their affiliations are as follows.⁵

Brazil: José L. Carvalho and Cláudio L. S. Haddad, Fundação Getúlio Vargas, Rio de Janeiro.

Chile: Vittorio Corbo, International Institute of Quantitative Economics, Montreal; and Patricio Meller, Corporacion de Investigaciones Economicas para Latinamerica, Santiago.

Colombia: Francisco E. Thoumi, Inter-American Development Bank.

Indonesia: Mark M. Pitt, University of Minnesota.

Ivory Coast: Terry Monson, Michigan Technological University.

Pakistan: Stephen Guisinger, University of Texas at Dallas.

South Korea: Wontack Hong, then of the Korean Development Institute, now of Seoul University.

Thailand: Narongchai Akrasanee, Thammasat University, Bangkok.

Tunisia: Mustapha K. Nabli, Faculté de Droit des Sciences Politiques et Economiques, Tunis.

Uruguay: Alberto Bension and Jorge Caumont, Universidad de la Republica, Montevideo.

The NBER was extremely fortunate in that a group of economists had been planning to undertake research on an almost identical topic under the auspices of the Center for Asian Manpower Studies. Three of them—Narongchai Akrasanee of Thammasat University, Wontack Hong, then of the Korean Development Institute, and Kuo-Shu Liang, deputy governor of the Bank of Taiwan—attended the first working party, and Akrasanee and Hong participated throughout the project and are contributors to this volume.

As arrangements were being made for the country studies, it was recognized that problems were likely to arise in particular fields—such as labor markets and the nature of substitution possibilities—while some research along cross-country lines would complement the work of the country authors. Jere Behrman, University of Pennsylvania, agreed to work on production functions and substitution possibilities; James M. Henderson, University of Minnesota, developed optimizing trade models for the individual countries; Robert Lipsey, Queens College and National Bureau of Economic Research, analyzed factor substitution by multinational corporations; and T. Paul Schultz, Yale University, focused on income distribution implications of the structure of effective protection and on labor markets. These individuals participated in the working parties and have been valuable consultants to some of the country authors when particular issues in their areas of competence have arisen. The results of their research, along with papers on special topics emanating from some of the country studies, will be found in the second volume of this series.

After the first working party, held in December 1975, individual country analysts began carrying out their own research plans, amending the uniform procedures as necessary in light of their countries' particular circumstances and data availability. At the midpoint in the research a second working party was held, in September 1976, at which authors presented preliminary results, discussed common problems, and raised new questions. Finally, research on the country studies has been completed and the major findings are presented in this volume. Not all results from each study are given here, however, because of limitations of space. In many instances the research findings are sufficiently rich so that monographs have resulted that will be separately published.

Coverage of Country Studies

Among other differences between countries, the amount of prior research available has been a significant determinant of the emphasis of the research undertaken by individual authors. Some countries, such as Chile, have been subject to numerous earlier investigations, so that a data base, as well as an analysis of the trade regime itself, was already at hand. In those cases, the authors were able to delve extensively into particular aspects of the relation between trade strategy and employment, including such areas as substitution possibilities and the extent of factor market imperfections. For other countries, little prior research had been done on even the most basic of topics, and the authors had to concentrate their efforts there. Such was the case with Indonesia, where no prior estimates existed of effective rates of protection for different industries, and with Uruguay, where data had to be obtained from individual records.

In addition to differences in the amount of prior research and in data availability, countries have differed significantly both in their choice of trade strategy and in underlying factor market conditions. These factors, too, have influenced the focus of individual country authors' efforts in analyzing their countries' experience.

Although individual differences would significantly influence the thrust of research efforts, country authors nonetheless examined and analyzed a common range of questions. They were asked to identify a particular period for which the necessary data were available, to trace the major characteristics of the trade and payments regime for that period that were likely to influence the commodity composition of trade and the factor proportions in traded goods industries, and to gather data on employment per unit of value added in different industries. From these data, estimates were made of the net factor content of trade and of labor utilization for different commodity aggregates. Most authors were able to provide some indicators of the skill content, as well as the input of labor units, in traded goods industries. Some traced the evolution of the commodity composition of trade, and the change in factor proportions, over time, linking those changes to alterations in the trade and payments regime itself. Finally, when previous research enabled country authors to obtain these estimates without time-consuming data collection, they examined factor markets to estimate the degree to which incentives in those markets affected factor proportions utilized in traded goods industries.

That, then, is the background of the country studies in this volume. All country authors commented upon project working papers, which contained much the same substance as the content in the next two sections. Throughout this volume, all instances where concepts and definitions do not accord with those given in this chapter are explicitly noted.

1.2 The Trade Strategies—Employment Relationship

1.2.1 Import Substitution and Export Promotion

One of the early lessons emerging from developing countries' experience in trying to raise their growth rates and standards of living was that there is an extremely close interconnection between the domestic pattern of industrial development and the nature of the trade and payments regime. It is widely recognized that successful growth will inevitably be accompanied by a more rapid rate of increase of nonagricultural than of agricultural employment. Growth of the nonagricultural sector can come about in two ways: new industries can arise whose output is to be sold on the domestic market, replacing imports; and new industries can

be developed whose output is expected in large part to sell on the international market.

The first of these alternatives, import substitution, basically relies upon the fact that an industry can achieve an above-average growth rate if, in addition to increasing output to satisfy the growth of demand associated with rising incomes, increases in domestic output can substitute for imports. The second alternative, export promotion, depends upon the international market to absorb higher rates of growth of output in particular sectors than could be sold domestically without depressing price unduly. The first inevitably entails trade interventions to protect the domestic market, while the second involves an open trade policy.

Economic theory, of course, suggests that *both* strategies should be pursued—each to the point where the last unit of domestic resources devoted to it yields the same return in terms of foreign exchange earned or saved. An optimal export promotion strategy would not imply that new industries would develop to sell exclusively abroad without any domestic sales, or that no import substitution industries would start up; nor does import substitution imply that no new products would be produced for export. It is the degree of emphasis on each that is in question. Further, there can be degrees of “bias” of either strategy: some countries, such as Chile, have relied almost exclusively upon import substitution, providing extreme incentives for producing and selling in the domestic market and failing to encourage—perhaps even implicitly taxing—development of exports. Others, such as Pakistan, have tended to encourage development of production for the domestic market, but incentives have been more moderate, some encouragement to exports has been given, and the result has been a less extreme orientation of new production to the domestic market. Likewise, some countries, most notably (among those included in the project) South Korea since 1960, have provided virtually no across-the-board incentives for import substituting industries, while heavily encouraging all lines of export activity; others, such as Colombia since 1967, have leaned somewhat in the direction of favoring export growth but have kept incentives sufficiently moderate so that the overall bias toward exports of the system has not been very great.⁶

Nonetheless, policymakers have generally regarded import substitution and export promotion as alternatives. In addition, experience has indicated that there is a tendency for the choice between the two strategies to be self-reinforcing. Once import substitution is adopted as a development strategy, there are built-in tendencies discouraging the growth of exports and thereby leading to the adoption of policies to correct balance of payments deficits that further encourage import substitution and discourage exports. These include such phenomena as the

higher price domestic firms must pay for inputs produced domestically, which reduces their international competitiveness; the lure of resources toward the lucrative and protected domestic market, which automatically reduces export growth; and the built-in requirements for capital goods, raw materials, and intermediate goods associated with many import substituting industries, which in turn lead to rapid growth of demand for imports and resulting quantitative restrictions upon imports, raising their price in the domestic market. These phenomena usually result in a tendency, once import substitution is adopted as a strategy, for increasing overvaluation of the exchange rate, which in turn intensifies the emphasis on import substitution as exports are further discouraged. An export promotion strategy also seems to entail tendencies that are self-reinforcing: rapid growth of exports leads to availability of foreign exchange, thereby mitigating the need for barriers to imports; exporters' needs for imported inputs prevent the erection of any elaborate structure to attempt to contain imports; an export promotion strategy mandates the maintenance of a realistic exchange rate, which itself encourages export performance and contains the demand for imports.

It is not the purpose here, or subsequently in the country chapters, to analyze the alternative trade strategies in all their ramifications. Rather, the central question is the relationship between those strategies and employment.

1.2.2 Employment

The level of employment is determined by the demand for, and the supply of, labor. That much said, however, arguments can rage as to the next step of the analysis: Do the demand and supply curves for labor depend upon the microeconomic properties of production and cost functions, or are they instead the result of macroeconomic variables? Is the level of employment determined within some sort of Keynesian or neo-Keynesian framework so that it is really the outcome of macroeconomic policy? Or is the world really neoclassical, so that the level of employment is determined by demographic variables, with the real wage being determined by the supply and demand curves for labor?

Answers to these questions range widely over all fields of economics, and there was no basis for believing that the NBER project could make a significant contribution to them. For purposes of the project, authors were essentially asked to assume a perfectly elastic supply curve of labor and to examine the basic question, How does the choice of trade strategy, abstracting from its effect on the overall rate of economic growth, affect employment?²⁷ This way of posing the question is tantamount to analyzing the extent to which alternative trade strategies shift the demand curve for labor to the right or the left. It avoids attempting to analyze

the determinants of the extent to which any change in the demand curve for labor will be divided between changes in the real wage and changes in employment.

There were several reasons for this procedure. First, there is the fact, already mentioned, that too many unresolved questions surround the operation of labor markets to permit a satisfactory sorting of any shift into the price and quantity responses. In addition, it is widely recognized that population growth is rapid in most developing countries and that the rate of growth of the labor force will be sizable for the next several decades regardless of the degree of success in reducing birthrates. For that reason, the supply curve of labor will be shifting outward (usually at a more rapid rate than the rate of population growth, owing to a changing age composition of the population), and it can be argued that an outward shift in the demand for labor of comparable proportions will be necessary simply to increase employment at a constant real wage, with a constant *rate* of unemployment. Finally, employment in tradable goods industries is usually a relatively small fraction of total employment. To the extent that this is so, the supply of labor to those industries may be perfectly elastic within the relevant range.

To be sure, the response to an outward shift in the demand for labor depends on a wide variety of conditions, including the conditions of wage determination in the labor market. Although authors were not asked to investigate the determinants of the extent to which outward shifts in the demand for labor are reflected in real wage (as compared with employment) increases, they were asked to investigate, where data and time permitted, the functioning of factor markets to attempt to ascertain the extent of factor-market imperfections and their possible effect on employment and factor proportions in traded goods industries. That topic is further discussed below.

Inevitably, any investigation of labor market conditions confronts the problem of defining homogeneous units of labor. Indeed, the general belief is that developing countries have a relative abundance of unskilled labor and a relative scarcity of skilled labor. The difficulty arises in estimating the skill attributes of the labor force well enough to have measured differences in "efficiency" of different categories of labor. Authors were asked, wherever possible, to attempt to analyze the composition of employment within industries, and general guidelines were agreed upon. Nonetheless, it was recognized that each author would be confronted with different data sets and different labor market circumstances; consequently, no attempt was made to achieve uniformity in the definitions of skill categories across countries. Thus, each author who was able to obtain any data shedding light on the skill composition of the labor force was to use his own judgment as to the reliability of the data. The country chapters therefore contain the authors' analyses

of the skill composition of different industries as far as data permit, but definitions of skills are not comparable across countries.⁸

1.2.3 Links between Trade Strategies and Employment

There are several levels at which the trade regime can interact with employment and its rate of growth:

1. One strategy might result in a higher rate of growth of the overall economy owing to superior resource allocation, and faster growth would presumably entail more employment growth.

2. Different trade strategies imply different compositions of output at each point in time. Under an export promotion strategy, export industries grow faster, as do import industries under import substitution. If employment per unit of output and value added is greater in one set of industries than in the other, then employment growth will be faster, on this account, under the strategy that lets the labor-intensive industries grow relatively faster.

3. Alternative trade policies could influence the choice of technique and the capital-labor ratio in all industries, as, for example, through implicit subsidization of capital goods imports. If such policies lead to greater capital intensity and fewer jobs per unit of output in all lines of economic activity, then employment opportunities will grow more slowly, while there is continued capital deepening.

Not all three classes of effects need to be in the same direction. It is possible, in particular, that the first effect—a higher rate of growth of employment owing to faster output growth—might go in one direction, while the second or third effect could go in the other. It was decided early in the project, however, that the first issue must of necessity remain outside the scope of the study, because to investigate it would require rehashing all the issues involved in the analysis of the merits of export promotion versus import substitution.

The objective of the present research project has been to come to grips with the second and third of the three levels defined above. Regarding the second, there are three possibilities:

1. The amount of employment generated is relatively independent of the trade strategy.

2. Export promotion generates significantly more employment growth than does an import substitution strategy.

3. An export promotion strategy is unlikely to entail significantly more employment growth than an import substitution strategy and may in fact conflict with efforts to expand employment.

The first possibility—that trade strategy does not affect employment very much—might be the correct one in several circumstances. First, one might be able to establish the direction of difference in labor intensity of production but find that the difference, if any, was sufficiently

small that, within the conceivable range of relative growth rates, the effects on employment would be negligible. Second, one might find that a particular policy not really essential to the trade strategy adopted had adverse effects on employment, and that the same trade strategy could be carried out under a different set of policies without adverse employment effects. This could happen if export promotion policies were to encourage capital-intensive industries. Finally, it might be that the influences determining the composition of exporting and import substituting industries are independent of factor intensities, and that different relative rates of growth of the two groups of industries would not necessarily affect the rate of growth of employment.

The second possibility—that export industries require more labor per unit of capital and per unit of output—is the forecast that would arise from a straightforward interpretation of the two-factor HOS model of trade. Developing countries would presumably have their comparative advantage, at least in the early stages of growth, in exporting labor-intensive commodities and importing goods with relatively higher capital (and perhaps skilled labor) requirements. The country studies tend to substantiate this possibility and also shed some light on the magnitude of the potential for creating employment through an export promotion strategy.

Finally, as I mentioned above, there were some who argued when this project began that there is a possibility that import competing industries are the more labor-intensive ones, and that export promotion and employment growth might be conflicting objectives. Several reasons were given. One view was that developed countries themselves had erected—or would erect if export promotion strategies were seriously adopted—such high barriers to imports of labor-intensive goods that the developing countries could compete only in capital-intensive industries. Another basis for the argument was early experience, mentioned above, suggesting that the exports of Colombia and Brazil under their export promotion policies were capital-intensive. Yet others claimed that most of the exports of manufactured goods originating in developing countries were produced by branches and subsidiaries of multinational corporations that, it was alleged, used the capital-intensive technology of the home country. Although there are examples of each of these circumstances among the country results, they tend to be the exception rather than the rule.

Influences of the trade regime on choice of technique, and influences of the factor market on commodity composition of trade, can be equally important. The underpricing of capital-goods imports may encourage the use of overly capital-intensive techniques for those fortunate enough to be permitted to import at overvalued exchange rates. High and enforced minimum wage rates may prevent the development of otherwise

profitable labor-intensive export industries. Extending subsidized credit to exporters may induce them to use more capital-intensive techniques than would otherwise be optimal.

All these influences can operate separately or together on the factor proportions in exportable and import competing industries. It is entirely possible that interactions between the domestic factor market and the trade regime are more important than differences between exportable and import competing industries in their factor proportions. Little is known about the direction or magnitude of these effects.

These are the basic questions addressed by the authors of the chapters that follow. As will be seen, there is enough evidence to conclude that trade strategies are important in affecting employment and that significant potential exists for expanding employment opportunities both by appropriate choice of strategy and by selection of incentives that do not discourage employment.

1.2.4 Market Imperfections

It has long been recognized that a nonoptimal trade strategy will result in commodity market distortions—in the form of import duties, quotas protecting domestic industries and allocating scarce foreign exchange, and export subsidies—that in turn can affect the commodity composition of trade and of domestic production. Any effort to analyze the relationship between trade strategies and employment must therefore take into account the commodity market distortions imposed by the trade regime and their interaction, if any, with other market distortions in the system. A significant question is the nature of the relationship between such commodity market interactions in particular industries and the factor intensity of those industries. A useful measure for characterizing the net effects of commodity distortions induced by the trade strategy on individual sectors and industries is the effective rates of protection (defined in section 1.3 below) for those industries. Country authors have analyzed the relationship between the height of protection (as reflected in effective rates of protection and other measures) for individual industries and the labor intensity of those industries. It is of interest that, although there are marked differences in individual cases, most authors found that industries subject to higher rates of protection were generally less labor-using than those subject to low rates of protection.

In recent years it has also been recognized that the trade regime and domestic policies affect the functioning of factor markets and can influence not only the commodity composition of production of tradable goods but also the choice of techniques within individual industries. A simple example relates to the practice, followed in many countries adopting an import substitution strategy, of permitting currency overvaluation and then failing to impose compensating duties and surcharges on im-

ported capital goods and relying instead on quantitative restrictions. Depending on policies used in allocating capital goods import licenses, such a practice may entail the implicit subsidization of the use of capital for those who get licenses. If, simultaneously, there is credit rationing, firms fortunate enough to receive loans and import licenses may face a very low cost of capital. This encourages the use of capital-intensive techniques within industries and makes the profitability of capital-intensive industries greater than it would otherwise be. In such circumstances, one can well imagine a country with abundant unskilled labor nonetheless exporting a commodity using capital intensively, while failing to export labor-intensive commodities.

Similar phenomena can exist in labor markets. The structure of protection may affect the relative price of wage goods. There are many cases in which economists have believed that domestic phenomena, including government legislation and trade union agreements, have influenced the real wage. The Harris-Todaro model (Harris and Todaro 1970) is one such labor market representation. In that model an artificially high urban wage induces migration from the countryside and urban unemployment. If such a representation were valid, increasing the number of employment opportunities could even increase unemployment. To be sure, wage differences can reflect differences in "human capital" and living costs as well as factor market imperfections. Obviously, skilled and experienced workers will receive a higher wage than unskilled workers in a competitive environment, so that a major problem for analyzing the functioning of labor markets is to ascertain the reasons for differences in wages among groups of workers.

The problem is therefore not simple. Before the extent of "distortions" in factor proportions in traded goods industries can be assessed, one must evaluate the private costs of capital and the determinants of wage differences, sorting the latter into their "efficiency" component and their "distortion" component. Given our limited understanding of labor markets in developing countries and the scarcity of reliable data, it was too much to hope that country authors could reach definitive judgments on these matters. Nonetheless, many were able to analyze some aspects of the functioning of labor and capital markets. Their results are of great interest for the light they shed on the functioning of those markets and the determinants of employment. In general, authors found considerable evidence that market imperfections induced the choice of techniques that were more capital-intensive than was optimal. But there is little evidence that these distortions resulted in export of the "wrong" commodities. This is important because if the observed factor intensity of trade is the outcome of distorted factor markets, one cannot infer causation running directly from the trade strategy to factor utilization: some

market imperfections, such as government-enforced minimum wage legislation, may themselves directly affect, if not determine, employment. If such were the case, one could not infer that the prevailing commodity composition of trade reflected comparative advantage. It is of great interest, therefore, that no country author found factor market distortions strong enough to have reversed the commodity composition of trade between capital-intensive and labor-intensive goods. Many of their results are highly suggestive for further research into the employment problem in developing countries.⁹

1.3 Definition of Concepts Used through the Project

1.3.1 Trade Categories, Sectors, Industries, and Commodities

In analyzing the relationship between trade and employment, one naturally wants to associate different structures of production and trade with alternative strategies.¹⁰ In theory, there are homogeneous and readily identifiable commodities, each produced within a single industry, and output is either imported or exported, but never both. The problems of deciding which commodity belongs to which trade category and of associating commodities with industries never arise.

For empirical work the situation is vastly different. Trade data are presented by commodities: at even the most detailed level, there are often two-way flows in most categories.¹¹ To complicate matters, production and employment statistics are of necessity collected according to industry rather than according to commodity. Even at the level of the individual firm, more than one output may be produced, and the problem is intensified at any level of aggregation. To confound issues still further, any nationwide set of production accounts, such as is found in input-output statistics, must be at some level of aggregation as industries are allocated to sectors.

Taking trade statistics by commodity and classifying them in a meaningful way with sectoral statistics originating from an industrial classification is a difficult and time-consuming job. For the project, all authors agreed upon a common terminology and set of concepts that it was desirable to use in reconciling trade and production statistics. Because of differences in data availability and in individual countries, however, it was not possible to agree upon a common criterion for deciding levels of aggregation, weighting systems, or classification. This was left to the judgment of each author, and the choices made are clearly indicated in each country study.

In this section I will set forth the trade categories used, then discuss some of the fairly general problems that authors faced in aggregation

and in reconciliation of trade and production data. Thereafter, I will discuss measures used to characterize the dimensions of employment and of the trade regime.

1.3.2 Trade Categories

The first task is selecting and defining the relevant trade categories into which to allocate the various commodities or sectors.¹² One must start by identifying the main categories of interest for the analysis. An empirical criterion is then needed for allocating various commodities and sectors to the relevant categories.

For this project, several categorizations were deemed useful. At the broadest level, it obviously made sense to define a class of tradable commodities viewed as importables and exportables and to regard other activities—that is, those with transport costs sufficiently high so that they are not tradable within the relevant range—as home goods (or non-tradables).¹³ Among tradables, importables and exportables were natural divisions, referring to commodities and activities for which there would be observed flows of commodities under an efficient allocation of resources within a “reasonable” variation of prices.

Among importable commodities, a three-way classification appeared to make most sense. The importables for which no domestic substitutes exist within the relevant price range are referred to as noncompeting imports. To the extent that domestic production is reported within such a sector, it presumably is due to aggregation and reflects the output of a subsector of the category.¹⁴ The other types of importables are those for which there is competitive domestic production and those that can be produced domestically only under the protection afforded by the trade and payments regime. The three types of importables, then, are noncompeting imports, “naturally” competitive import-competing goods, and protected import-competing goods.¹⁵ The criterion for assigning sectors to these categories and to exportables and home goods is given below.

For both importable and exportable categories, a further breakdown is essential. That has to do with the nature of the activity involved. In particular, there is a great deal of evidence that the behavior of tradable commodities that depend upon the local availability of natural resources for their production may be quite different, both in its determinants and in the likely supply response to altered prices, from the behavior of the tradable commodities for which location is not contingent upon direct access to the source of the raw material.

It was therefore decided that the categorization, within exportables and importables, would be (1) natural resource based goods and activities divided into agricultural, mineral, and other (including processing manufacturing industries); and (2) HOS goods.

Natural resource based (NRB) activities are those whose profitability depends basically upon the existence of some resource deriving a rent, such as land and mineral resources. While a change in the relative price of capital and labor might induce both substitution between these factors and perhaps also a change in the extensive margin of exploitation of minerals or cultivation of land, the industry's existence or absence, and hence the country's comparative advantage, is primarily the result of the presence of the natural resource whose exploitation is economic.

By contrast, HOS goods are defined as those whose production location is not determined by the location of the resource to which rent accrues. For HOS sectors, profitability (and hence location) is primarily a function of the relative prices of labor (of various grades of skills) and capital goods and their services.

All country authors treated primary commodities as NRB. The chief difficulty lay in categorizing manufacturing activities. In theory, if the primary commodity cannot economically be traded without processing, the processing activity is NRB. If the primary commodity can be traded economically, then processing it is an HOS activity. In practice, however, there is always an element of doubt for some activities, and country authors were asked to use their judgment. In many instances the decision was to present figures in two ways. For the Ivory Coast, for example, there is a petroleum-refining facility that provides oil for the Ivory Coast and several neighboring countries. Its categorization is doubtful, and Monson provided totals both with and without it. In other instances authors have treated all manufacturing as HOS, but then subdivided HOS industries into those that are primary commodity based and those that are not.

There are several reasons for selecting these categorizations. First, it seems clear that the determinants of comparative advantage in such commodities as oil (e.g., Indonesia) and coffee (Brazil, Colombia) are the availability of the raw material and hence of the underlying natural resource—the mineral or the right kind of land. While factor proportions are of interest in those industries, they are open to somewhat different interpretations than are factor proportions in the HOS goods, discussed below. It can be plausibly argued that many, though not all, NRB sectors will be exportable or importable independent of the trade strategy. In other words there is a basis for believing that many NRB commodities are intramarginal, because the natural resource itself is earning rents. This leads immediately to the second reason. That is, while one may wish to examine the “net factor content of trade” to determine the extent to which the demand for factors of production has shifted upward or downward in the aggregate, consideration of alternative trade strategies and their employment implications should legitimately be focused more directly on the factor requirements for a marginal expansion of trade. It

can plausibly be argued that a switch in trade policy will not result in proportionate expansion of existing exporting industries. Rather, it is likely (and is verified by the experience of such countries as Korea) that a switch in strategy will entail the disproportionately large expansion of manufactured exports, especially in the HOS industries.

The decision to categorize industries and activities according to the NRB-HOS dichotomy was based essentially on the two reasons already given. Country authors' results, however, indicate that there was a third, practical reason for so doing. That is, the labor per unit of value added or of output is so much higher in the agricultural sectors than in the manufacturing sectors of the developing countries that agricultural exports always appear labor-intensive. The labor requirements per unit of output, as calculated from an input-output table or census of agriculture, are so much greater than those in other sectors of the economy that they completely dominate the estimate of the total labor requirements for different commodity categories. It is arguable, moreover, that a significant part of the labor input record in the agricultural sector may reflect an average, not a marginal, figure. Those who contend that there is "disguised unemployment" in agriculture would adhere to that view. Whether there is or not, it makes sense to estimate labor coefficients for primary and other activities separately.

A final categorization of sector, usually within the categories indicated above, was between those where trade was predominantly either with other developing countries or with developed countries.¹⁶ For some countries, such as Indonesia and Tunisia, trade was so overwhelmingly with developed countries that the categorization according to type of trading partner had little meaning. For other countries, such as Brazil, Chile, and Uruguay, where a significant fraction of HOS trade was within a regional preferential trading arrangement, analysis of the difference in factor proportions as a function of the direction of trade proved more meaningful.

As I have already indicated, it was left to the authors' judgment to determine whether an activity was NRB or HOS, and the allocation according to trade destinations or origins was straightforward when the data were available. The major procedural question pertained to the allocation of activities among the categories of tradables. It was clear that judgment would have to be used. Especially for countries where quantitative restrictions and very high tariff levels distort the pattern of trade significantly from what would be observed under an efficient allocation of resources, authors had to allocate activities to tradable categories based upon their detailed knowledge of the situation. In Pakistan, for example, import substitution proceeded so far in most consumer goods lines that imports virtually ceased. Nonetheless, Guisinger

treated these industries as tradables based upon his knowledge of the regime.

There were other reasons why no single criterion could be used for all countries. Of particular importance was the fact that the degree of aggregation of the available statistics varied widely. For countries with more disaggregated statistics, cross-flows—that is, observed exports and imports within the same sector—were likely to be less of a problem than for countries with a more highly aggregated data base. Nonetheless, it was deemed useful to ask authors to compute a common statistic, and then to choose their cutoff points around it and defend departures from it in line with their individual country's experience.

It was decided that assignment of sectors, at the feasible level of disaggregation, should be based upon a “ T ” statistic, defined as:

$$(1) \quad T_i = \frac{C_i - P_i}{C_i},$$

where C_i = domestic utilization and P_i = domestic production. Each commodity or sector is classified as exportable if $T_i < X_0$; import competing if $X_0 \leq T_i < X_1$; and noncompeting if $X_1 \leq T_i \leq X_2$; where X_i s were chosen as cutoff points. Each country author determined the appropriate X_0 and X_1 for his country. If X_0 were set at zero, for example, a negative T_i would mean the commodity or sector was classified as an exportable. Because of the possibility that domestic production might represent a nonhomogeneous product group, it was often best to let X_1 assume a value somewhere between 0.5 and 0.99, depending on the degree of disaggregation at which the analysis was conducted. When there is little or no domestic production, the i th commodity can be regarded as a noncompeting import, and the upper limit X_2 would necessarily be 1.

As I already mentioned, calculation of the T_i s was a starting point. That some import regimes contain import prohibitions led to some modifications of the rules. Likewise, some authors identified commodities for which domestic production equaled domestic demand but that would be exported at a realistic exchange rate, and they modified their procedures accordingly. In effect, authors were asked to use their judgment on what the T statistic would be under an efficient allocation of resources.

1.3.3 Aggregation and Weights

Reconciling trade and production statistics is an onerous job. In general, most of the decisions made by country authors were forced upon them by the nature of the data available, and there was not much scope for judgment. Authors did, whenever possible, attempt to avoid aggre-

gation whenever there would be sizable imports and exports within a given sector, or whenever the factor proportions utilized were significantly different among otherwise similar categories.

The major area where choices arose was in the construction of statistics characterizing the employment coefficients associated with various categories of tradable activities. There is no one correct basket of goods. The choice depends on the question being asked. Consider, for example, the straightforward question, At existing factor proportions, what would be the shift in the demand for labor associated with a marginal increase of \$1 million in exports contrasted with an increase of \$1 million of import substitutes? Even once sectors are identified with appropriate categories of tradables, there is a question as to the appropriate set of weights to be used in aggregation.

To estimate empirically the likely content of a \$1 million basket of exports, the most reasonable approximation for weights might be either the observed basket of exports or the observed composition of manufactured exports only.¹⁷ The choice would depend on one's judgment about the feasibility of expanding traditional exports both in production and in sales abroad. Thus one would probably apply trade weights to some subset of exports to the coefficients of different exportables to attempt to answer the question of the net employment effect of expanding exports.

On the import side the choices are different. The relevant unit is probably not the entire vector of imports, since there are some commodities that cannot be domestically produced. It may be that one should use consumption weights for commodities that are domestically produced but importable (import competing), or it might be that trade weights for that same category of goods were a better indicator of the likely direction of trade expansion.

There is no entirely satisfactory answer on a priori grounds to the choice of trade weights, production weights, or consumption weights. In fact, some authors were constrained in their choices by data availability. In instances where authors could experiment with alternative sets of weights, such as in Chile and the Ivory Coast, the weights used did not appear to affect the results significantly, once categories of tradables were selected. On a priori grounds, therefore, one might anticipate that results would differ significantly depending upon the choice of weights. In practice, however, that does not appear to be a significant problem in interpretation of country authors' results.

1.3.4 Characterizing Trade Regimes

All country authors have analyzed the trade regime in their country as it influenced the commodity composition of trade, thereby affecting factor proportions. Each author has evaluated the degree to which the

regime was oriented toward export promotion or toward import substitution and the effect of the regime on the choice of techniques in various industries.

To do this, authors first had to obtain estimates of effective exchange rates (EERs) for various categories of goods. Next they needed to derive estimates of the relationship of domestic value added to international value added per unit of output. To do this they generally obtained estimates of effective rates of protection.

Exchange Rates

In many developing countries, the nominal or official exchange rate bears little relation either to the costs of foreign exchange paid by buyers or to the receipts of exporters. Some trade regimes are restrictive enough so that the prevailing exchange rate, even after adjustment for tariffs and surcharges, bears little relation to a realistic one that might prevail under an efficient allocation of resources.

All country authors were asked to provide estimates of effective exchange rates (EERs) for different categories of transactions—those exchange rates being defined as the amount of local currency actually received or paid per unit of foreign exchange. The distinction was further drawn on the import side between EERs, on the one hand, and premium-inclusive EERs on the other. These latter represent the exchange rate that would have to prevail for individual commodity categories in order for the domestic price to equal the international price in a competitive market. Since quantitative restrictions (QRs) as well as tariffs influence the protection given to domestic producers, these rates are the ones theoretically correct to measure the incentives to produce import substitutes and are therefore relevant for determining the degree to which the pattern of production is influenced by the trade regime.

Because countries have widely different inflation rates, it also is useful to distinguish between EERs, which refer to actual currency values at given points of time, and price level deflated EERs (PLD-EERs), which are the actual EERs deflated by the most relevant price index (home goods, if available). Until the early 1970s, the world inflation rate was extremely slow, and the dollar index of the prices of internationally traded goods moved hardly at all. Therefore it was usually permissible to compute PLD-EERs and to use them to interpret the behavior of the “real” exchange rate. Since the early 1970s, however, world prices have been rising rapidly enough so that a constant PLD-EER would imply an increasingly competitive currency on world markets. For that reason it has become necessary to take into account not only the behavior of the prices in the country under scrutiny but also that of the prices of its major trading partners. To do that, one must deflate (i.e., multiply) the EERs by the ratio of an index of prices in other countries

to the domestic price index. Such a construct, the purchasing power parity effective exchange rate (PPP-PLD-EER) is perhaps the most appropriate measure of the behavior of a currency and trade regime over time. To be sure, this is not intended to imply that PPP-PLD-EERs should remain constant over time. When the discovery of new mineral deposits or a tremendous increase in the price of an exportable, such as coffee or oil, significantly alters a country's situation vis-à-vis the rest of the world, a change in the PPP-PLD-EER may well be called for. But when changes are brought about by differentials in inflation rates, there is no presumption that those differentials reflect changes in the underlying international situation. In those cases, PPP-PLD-EER calculations provide a first approximation of the effect of the trade and exchange regime on the domestic producers of exportables and import competing products.

Effective Rates of Protection and Domestic Resource Costs

In addition to estimating EERs, country authors were asked to obtain estimates of effective rates of protection (ERPs) (including the value of nontariff barriers) for the same commodity or sector classification that they used for estimates of labor coefficients. In some cases, such as Chile, estimates were readily at hand from earlier research. In others, such as Indonesia and Uruguay, providing estimates of ERPs is a significant contribution to knowledge.

The basic data required are domestic and international prices. In instances where tariffs (and other charges translatable into tariff equivalents) are the only form of protection, it is relatively simple to compute the statistic

$$(2) \quad ERP_j = \frac{t_j - \sum_i a_{ji} t_i}{1 - \sum_i a_{ji}},$$

where t_j is the tariff on the j th commodity, a_{ji} is the input of i per unit of output of j , and where all international prices are normalized at unity.¹⁸ In effect, the numerator reflects the excess of domestic value added over international value added and the denominator represents international value added; that is, value added measured at international prices. An ERP, therefore, is the proportionate protection provided to a value-adding activity.

When data on tariffs were available (and tariffs were the only barrier to trade) a first problem was to ascertain whether the rates were binding or whether there was water in the tariff. A number of authors, notably Bension and Caumont for Uruguay, concluded that domestic prices were considerably below the c.i.f.-plus-tariff price and adjusted their estimates accordingly. Once that was done, the only task was to compute the ERPs for individual commodities and then to transform them to sectoral esti-

mates in conjunction with the input-output table.¹⁹ In most countries, however, tariffs do not constitute the only form of protection, and a major problem is to determine the tariff equivalent of quotas and other protective devices. Obtaining direct price comparisons is the most satisfactory means of surmounting that difficulty, but it is extremely time-consuming if no prior study is available. In cases where prior studies are not available, authors have supplemented tariff data with attempts to estimate the probable effect of quantitative restrictions on different commodity classes.

Protection does two things: it can provide cover for the difference between domestic and foreign costs of production, and it can permit domestic producers to enjoy a monopoly position they would otherwise not have. Measures of effective protection can therefore be interpreted as a measure of the change in incentives caused by the trade regime from those that would occur under free trade. To estimate the additional costs of production resulting from protection, a measure eliminating the monopoly element and also adjusting for divergences between market and shadow prices,²⁰ is needed. The domestic resource cost (DRC) measure has been used for this purpose, especially in contexts where there is reason to believe that significant distortions occur both in factor prices and in monopoly positions of individual industries. Some country authors have used DRCs in their studies as an indicator of the costs of trade regime and of potential expansion of alternative activities. DRCs are computed by taking the data necessary for ERP computations and altering the estimates of the costs of inputs to adjust for differentials between market prices and those believed to reflect opportunity costs better.

IVA and DVA

An ERP estimate is basically an estimate of the percentage by which domestic value added (DVA) in a particular industry or activity exceeds value added measured at international prices (IVA) in the same activity. Both DVA and IVA are important, but for different purposes: domestic value added (unless there are large differences between market and shadow prices) is probably the appropriate concept for examining the domestic marginal rate of transformation between activities, while international value added is more appropriate for examining opportunities for transformation through trade. Authors initially obtained data on labor (in various units—man-years, wage bills, etc.) in different activities from what were, in their judgment, the best sources available. In all cases, a major task was to transform data on labor utilization, usually derived from production data, into units conformable with the trade data. These data were generally expressed in terms of units of labor per unit of DVA. In most instances, once ERPs were available, authors were able

to transform these data into units of labor per unit of IVA in a straightforward manner.

It seems clear that any measurement of the labor utilization should be done per unit of value added, rather than per unit of output. The reason for this is that different industries have very different ratios of intermediate inputs to outputs: if labor per unit of output was calculated, it is likely that industries with low ratios of purchased inputs to outputs would show high labor coefficients.

1.3.5 Labor Coefficients

In addition to the problem of defining and estimating skills, there are three problems pertaining to the estimation of labor coefficients: (1) even though it is recognized that it should be labor per unit of value added, there is a question of the appropriate value-added concept; (2) there is a question of the choice of units with which to measure labor; and (3) there is a question of how to obtain meaningful coefficients for sectors where imports are classified as not competing with domestic production.

With regard to the relevant unit of value added, it was decided at the outset that two distinct sets of labor data should be obtained if at all possible. On one hand, there should be an estimate of the "direct" labor utilized in the production of one unit of domestic currency's worth of value added. On the other hand, an estimate should also be made of the direct labor requirements per unit of value added *plus* the requirements of labor in the production of home goods for use in tradable goods production. This latter concept is perhaps more relevant for examining the effect of a change in trade strategy: if trade policies were altered in a manner that increased value added in imports and exports by an equal amount, it seems clear that the expansion of exportable production would require not only factors of production directly, but also home goods such as construction, electricity, finance, and domestic transport. Home goods production itself requires factor inputs and purchased inputs, some of which are themselves home goods. The term "direct requirements of labor plus indirect requirements in home goods" is designed to capture this total expansion, and it is this concept that was set out in the guidelines for the project.²¹

Given the ambiguity of words when it comes to such concepts, it may be useful to express algebraically what is being measured. The direct labor requirement per unit of DVA in the j th activity, L^d_j , can be computed from data on total employment in j , E_j (measured in the most appropriate unit available, being sure that units are comparable in different activities), the domestic value of output, V_j , and the domestic value of purchased inputs, M_j , as

$$(3) \quad L^d_j = \frac{E_j}{V_j - M_j} .$$

Indirect labor requirements in home goods per unit of output of the j th tradable are $a_{hj} \cdot \frac{E_h}{V_h}$, where a_{hj} is the input of home goods per unit of traded goods output. Value added per unit of output of home goods is $(V_h - M_h)/V_h$, so that value added in home goods per unit of output of tradables is that times a_{hj} .

Labor used directly and indirectly in home goods per unit of value added directly in traded goods and directly and indirectly in home goods is therefore

$$(4) \quad L_j^t = \frac{a_{hj}(E_h/V_h) \cdot V_j}{V_j - M_j + a_{hj}[(V_h - M_h)/V_h]}.$$

Total requirements of labor directly in the j th tradable plus indirect requirements in home goods, L_j^t , per unit of value added directly in tradable and indirectly in home goods used in tradables is therefore

$$(5) \quad L_j^t = \frac{E_j + (a_{hj} E_h/V_h) \cdot V_j}{V_j - M_j + a_{hj}[(V_h - M_h)/V_h]}.$$

Of course, if home goods themselves require inputs of other home goods, a_{hj} should be interpreted as including such further indirect use of home goods per unit of tradable, and $a_{hj}(V_h - M_h)$ should be domestic value added in indirect plus "indirect-indirect" use of home goods. It should be noted that both numerator and denominator increase when the measurement of labor requirements per unit of value added goes from direct requirements only to direct-plus-indirect and on to indirect-indirect requirements.

The choice of the unit with which to measure labor utilization, which is closely related to the problem of measuring skills, was left to the individual authors. Ideally, one would like to measure man-hours of homogeneous labor categories, because years, months, or even man-weeks can obscure considerable variation in hours worked, seasonality of the industry, and so on. However, data limitations made this ideal unattainable in most of the country studies, and the practical choice was between a physical unit such as man-years and a value unit such as the wage bill. When a unit such as man-years closely reflects workers of like skill (or workers in different industries employing the same mix of skills), use of the physical measure is preferable. When, however, few data are available on skill and there is reason to believe that the proportions in which skilled and unskilled labor are used differ significantly across industries, a value unit can be preferable, especially if it is believed that the labor market functions with few imperfections between the industries across which comparison is made. Using the wage bill as the unit of observation is equivalent to assuming that more highly skilled workers are perfect substitutes for unskilled workers, but more efficient in proportion

with the wage difference. The use of a physical unit such as man-years uncorrected for skill differentials is equivalent to assuming perfect substitutability of all workers at a one-to-one ratio. The truth probably lies somewhere in between, and it was left to individual country authors to determine what measure, in their judgment, best reflected labor utilization rates. The best solution, of course, was to obtain data separately for different skill categories. As can be seen in the individual studies, authors met with varying degrees of success in obtaining such data, but in no case was it possible to achieve an ideal data set.

There was little question of how to obtain estimates of the labor coefficients for exportable sectors and for sectors where domestic production was competitive with imports. To be sure, authors had to use judgment in aggregation, but once that decision was made the computation was straightforward.²² However, it is readily apparent that estimating the potential factor intensity of sectors where domestic demand is now met by imports is of great importance in estimating the employment implications of import substitution. Moreover, insofar as the imports are truly noncompeting, whatever production is reported domestically for ostensibly similar goods is usually the result of aggregation and reflects factor proportions in an industry not representative of what would happen with development of the import substitution industry.

The recommended procedure in such cases was to obtain an estimate of factor proportions in the corresponding industry in another country along with factor proportions in an industry producing in both that country and the country under study. The ratio of the labor inputs in the two industries in the foreign country was then computed and applied to the labor input in the common industry in the home country to estimate the potential labor requirement in the hypothetical industry. Algebraically, L^d_i , the computed labor coefficient for the i th industry in the home country, was derived from

$$(6) \quad \frac{L^d_i}{L^d_j} = \frac{L^o_i}{L^o_j},$$

where d is the home country, o is the other country, the i th industry operates in o but not in d , and the j th industry operates in both countries.

This procedure is tantamount to assuming that the industries have the same elasticity of substitution in both countries and that observed differences in coefficients reflect substitution in response to changes in relative factor prices.

1.3.6 Measures of Capital Services

Although there are significant problems in measuring the labor input into a particular activity in an economically meaningful way, those prob-

lems are not as serious as the problems associated with attempting to estimate the input of capital services. For the latter, problems of aggregation are significant, and valuation is affected by bookkeeping practices, inflation rates, and tax laws. In addition, rates of utilization of machinery differ widely and present conceptual as well as empirical problems.

Since emphasis in the present study was on the relationship between trade strategies and employment, attempts at estimating capital inputs were not of primary concern for analysis. Nonetheless, there are a number of questions for which such estimates provide valuable information, and country authors were urged to present them whenever they were available and meaningful. In some instances, physical measures, such as electricity used per unit of value added or horsepower of installed capacity, were utilized in addition to a value measure. Given the theoretical difficulties known to surround any measure of capital services, it is reassuring that, for those countries where several proxy measures could be presented, the results did not appear to be sensitive to the choice of unit.

1.4 Conclusion

This is not the place to attempt to synthesize the results of the individual studies; they are of great interest in their own right and the findings and methodology used in each merit scrutiny.

What should be evident is that, despite severe data limitations, each country author has been able to derive meaningful results that appear fairly robust. While care will be needed in drawing conclusions, it is already clear that, given reasonably open markets abroad, export oriented policies have been more favorable in some cases, or could have been in others, than import substitution policies in expanding employment in developing countries. Many of the authors have devised methods for estimating the total employment effect of trade strategy choices and domestic factor market distortions. Their estimates are indicative of the importance of the topic and of the need for a great deal of additional research.

Given the data limitations confronted by the country authors, it is surprising how much they could accomplish with the information at hand. It is perhaps not surprising, however, that little had been done earlier on the trade-employment relation. The results testify to the importance of the topic and the need for better data. In this regard it is clear that much must be done to provide closer comparability between trade, production, and input-output statistics. There are few countries for which these data are currently available on a common basis, and the task of reconciling them has consumed enormous time and energy

in the project. In a world where trade flows are assuming increased importance, I hope that reconciliation of these data with domestic production data will assume high priority.

The results of the individual studies that follow represent a significant step forward in our understanding of the relationship between trade strategies and employment. To say that further research is called for is only to conclude that the contribution to knowledge from investigation of the topic is significant.

Notes

1. See, in particular, Little, Scitovsky, and Scott (1970); Bhagwati (1978); and Krueger (1978).

2. For a recent summary of the Leontief paradox literature and findings, see Baldwin (1971, 1979) and Branson and Monoyios (1977).

3. Diaz-Alejandro (1976, p. 45).

4. The working paper is available upon request from the NBER. The chief concepts and definitions emerging from it are, however, given in section 1.3 of this chapter.

5. Studies of India and Kenya were also undertaken but could not be completed in time for inclusion in this volume.

6. For further discussion of these issues, see Krueger (1978).

7. An alternative interpretation would be that authors were asked to investigate the horizontal shift in the demand-for-labor function associated with an alternation in trade strategy.

8. Even if it were, there would be no assurance that labor in a particular skill category was the same in one country as in another.

9. These results will be assessed in the third volume of this series. See also the contribution by T. Paul Schultz in the forthcoming second volume.

10. The concepts used in this project are consistent with those used in the earlier NBER project, *Exchange Control, Liberalization, and Economic Development*. See Krueger (1978, chap. 5 and Appendix A).

11. The problem of two-way flows has vexed analysts for years. There are important questions about why such flows should exist. On one hand, they might reflect aggregation, and on the other hand it is conceivable that they are the outcome of spatial separation, such as when western Canada exports oil to the western part of the United States and eastern Canada imports oil from the eastern part of the United States. Recently, however, additional attention has been given to the phenomenon, and there have been extensive investigations of the phenomenon of intraindustry trade. Grubel and Lloyd (1975) have investigated this subject in detail and conclude that much of it represents efficient location of production within industries.

12. The question is closely related, but not identical, to the problem of choosing appropriate weights, which is discussed below.

13. The term "nontraded" is to be avoided, since it is ambiguous in trade regimes in which quantitative restrictions are used. Some goods, although tradable, are nontraded because of prohibitions against their import (or, rarely, export). For

purposes of analyzing the trade regime, these goods are quite distinct from home goods.

14. For example, in many developing countries one observes the sector "transportation equipment" as being very labor-intensive. This is usually because repairs dominate the economic activity in that sector.

15. Language becomes awkward when referring to the production counterparts of the import categories. "Import-competing" production of both types makes sense, but "noncompeting" production is ambiguous. Throughout this volume, an effort has been made to refer to production of noncompeting importables as a means of avoiding ambiguity.

16. For the rationale behind the DC-LDC categorization, see Krueger (1977).

17. Even here, there would remain a question whether the \$1 million basket was to be measured in terms of output or of value added in export industries. This problem is discussed below.

18. The formula should be computed at the prices and input-output relationships that would prevail under free trade. In fact, all authors used actually observed domestic coefficients for each alternative. When there are no substitution possibilities between the intermediate inputs and other factors, this procedure is unbiased.

19. Country authors were asked to follow Corden (1971) in their treatment of home goods.

20. Shadow prices themselves can have a number of interpretations. There is an opportunity cost that would occur under an efficient allocation of resources. It might be quite different than the opportunity costs for a marginal change from a given, nonoptimal allocation of resources.

21. It can also be argued that, under import substitution, the relevant labor requirement for expansion of any sector is the direct plus *total* indirect requirement. Many authors computed those data, and the numbers are sometimes presented in the country studies. However, even for that purpose there is a question whether the total indirect requirements reflect an efficient use of resources, even under import substitution.

22. It is possible that exports and domestic sales are different qualities or sell at different prices. Authors were asked to evaluate the severity of the problem for their countries, but in all cases except Uruguay the data did not permit them to pursue the question.

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