Trade and Growth: Still Disagreement about the Relationships

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ABSTRACT/RÉSUMÉ

The relationships between trade and growth have long been a subject of considerable controversy among economists. In the early post-World War II period, many economic leaders concluded that protective trade policies stimulated growth, and import substitution policies were widely adopted by developing countries. By the 1980s, however, country-specific and general cross-country analyses had demonstrated the failure of the import substitution approach, and consequently export-oriented policies were widely adopted. While subsequent cross-country studies have generally indicated the growth effectiveness of outward-looking policies, recent criticisms of these studies (by Rodriguez and Rodrik, 1999, in particular) have called this conclusion into question.

JEL classification: F13, F43, O19
Keywords: Trade and growth; Trade policy, economic development.

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Les relations entre le commerce et la croissance ont été depuis longtemps sujet à controverse parmi les économistes. Durant la période qui a suivi la deuxième guerre mondiale, beaucoup de leaders dans le domaine de l'économie concluaient que les politiques commerciales protectionnistes étaient stimulantes pour la croissance, et que des politiques de substitution de l'importation étaient largement en vigueur dans les pays développés. Au cours des années 80, cependant, les analyses nationales et internationales ont démontré l'inefficacité de l'approche de subsitution de l'importation, et donc les politiques visant l'exportation ont été favorisées en conséquence. Si les études internationales ultérieures soulignent en général l'efficacité, en termes de croissance, des politiques favorisant l'exportation, de récentes critiques de ces études (en particulier, Rodriguez et Rodrik, 1999) ont contesté cette conclusion.

Classification JEL: F13, F43, O19
Mots-clés: Commerce et croissance, politique commerciale, développement économique.

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Robert E. Baldwin[2]

I.   Introduction

1.   The relationships between trade and growth have long been a subject of controversy among economists. This situation continues today. Despite a number of multi-country case studies utilising comparable analytical frameworks, numerous econometric studies using large cross-country data sets, and important theoretical advances concerning how trade and economic growth interact, there is still considerable disagreement concerning the relationships between these economic variables.

2.   There are several reasons for this. One important reason for the divergence in views on the subject relates to the differences among investigators in the manner they define the issue being studied. Some authors focus, for example, on whether there is a causal relationship between increases in trade and increases in growth (or between increases in growth and increases in trade), no matter what the reasons for the increases in trade or growth. However, most authors are interested in the effects of differences in government policies on trade and growth. The impact of government policies on such concepts as the "openness" of a country to trade and investment and its "inward-orientation" or "outward-orientation" to these flows is the subject of many studies. But, of course, just how broadly one defines such terms greatly affects one's conclusions about a particular country or set of countries. One can interpret openness in narrow terms to include only import and export taxes or subsidies as well as explicit non-tariff distortions of trade or in varying degrees of broadness to cover such matters as exchange-rate policies, domestic taxes and subsidies, competition and other regulatory policies, education policies, the nature of the legal system, the form of government, and the general nature of the institutions and culture.

3.   Differences in the quality and detail of the data being analysed are another important source of disagreement among economists on the subject. Those who study trade and growth relationships among developing countries are greatly hampered by the lack of good data even on such matters as levels of import protection and usually are forced to undertake case studies. While many insights have been revealed from such studies about the nature of the development process and its relationship with trade, one is reluctant to draw broad generalisations from them because of their specificity and the bias that the personal viewpoints of the authors may introduce into the analyses. In contrast, while econometric analyses based on quantitative data concerning trade and growth for a cross section of countries do permit broad generalisations, these studies are limited by the scope and comparability of the available quantitative data. Differences in what investigators regard as appropriate econometric models and tests for sensitivity of the results to alternative specifications also result in significant differences in the conclusions reached under such quantitative approaches.

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1.   Paper prepared for the OECD informal workshop on "The Causes of Economic Growth," Chateau de la Muette, Paris, 6-7 July 2000.

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4.   The purpose of this paper is to survey briefly the views of economists and policymakers since around the end World War II concerning the relationships between trade and growth, indicating how and why these views have significantly changed over the last 50 years and pointing out the main specific reasons for the disagreements. Section II examines the 1950s and 1960s when import substitution was the dominant growth policy in the developing countries and there was also extensive government intervention in many industrial countries aimed at influencing growth rates. Section III then considers the period from the 1970s into the 1990s, in which the findings from an increasing number of studies of the growth experiences of individual countries caused more and more economists and policymakers to become sceptical about the growth merits of import substitution policies and to begin to advocate more export-oriented, outward-looking trade policies. Recently, however, some economists have argued that the merits of these latter policies have been overstated and that, in fact, because of various methodological shortcomings in the major cross-country econometric studies, one should conclude that there is very little evidence that open trade policies are significantly associated with economic growth. This "revisionist" view is discussed in Section IV. Section V summarises the main conclusions reached in the paper.

II.   Import substitution policies as the means to stimulate economic growth

5.   As more and more countries obtained their independence from the colonial powers in the period shortly after the end of World War II, a widespread view developed among economists and policymakers that the best way for these countries to develop more rapidly was to stimulate industrialisation by adopting import-substitution policies. At the time, there seemed to be a number of good reasons for such an approach. The political leaders of the newly independent nations were keenly aware not only that most of the countries from whom they obtained independence had much higher per capita income levels and were much more industrialised but that their former rulers had imposed economic policies in the past which discouraged industrialisation within the new nations. To these new leaders, industrialisation seemed to offer the possibility of achieving faster growth, higher per capita income levels and the economic and military power needed for national security. An economically sensible way of achieving industrialisation seemed to be to restrict imports of manufactured goods for which there already was a domestic demand in order both to shift this demand toward domestic producers and permit the use of the country's primary-product export earnings to import the capital goods needed for industrialisation. There also appeared to be a number of examples where high levels of import protection in the nineteenth and twentieth century had contributed positively to industrialisation. Although Great Britain had adopted a policy of free trade during its period of rapid growth in the nineteenth century, the United States seemed to industrialise and prosper by imposing high import duties on manufactures for much of the later part of the nineteenth century. Germany and France also adopted protectionist policies during this period, as did Japan after 1900. The impressive degree of industrialisation achieved by the Soviet Union in the 1920s and 1930s and by China after 1949 by pursuing inward-looking policies were additional historical examples that impressed the leaders of the newly independent nations.

A.   The infant-industry and other arguments for import protection

6.   The so-called infant industry argument first set forth in 1791 by Alexander Hamilton, further elaborated by Friedrich List (1856), and accepted by many classical and neo-classical economists as the major theoretically valid exception to the case for worldwide free trade provided economic support for import substitution policies. John Stuart Mill, who first formalised the argument in economic terms, argued that it takes time for new producers in a country to become "educated to the level of those with whom the processes are traditional" and thus for their unit costs to decline. The infant industry argument maintains that during the temporary period when domestic costs in an industry are above the product's import price, a

tariff is a socially desirable method of financing the investment in human resources needed to compete successfully with foreign producers.

7.   Soon after World War II, Raul Prebisch (1950), who was Secretary General of the United Nations Economic Commission for Latin America and later organised and became Secretary General of the United Nations Conference on Trade and Development (UCTAD), among others argued that the infant industry argument was applicable to the entire manufacturing sector and not just to a single industry. He also claimed that an ongoing secular decline in the prices of primary products (the exports of the less developed countries) relative to the prices of manufactured goods (the exports of the developed countries) and the low elasticity of demand for primary products made expansion in the production of primary products unattractive. Focussing on producing labour-intensive manufactured goods, *e.g.* clothing, for export purposes also did not appeal to most less developed countries at this time because of the belief that a balanced industrial structure, such as existed in most developed countries, was necessary to achieve their goal of high per capita income levels and, moreover, because high levels of import duties and other import barriers still existed in the developed countries on most of these goods.

8.   Although most economic leaders of less developed countries looked favourably on the strategy of import substitution; they often found themselves backed into such a policy somewhat inadvertently. Because of the shortage of goods these countries suffered during World War II and the economic expansion plans of their new leaders, there was a tremendous demand on their part for both capital goods and consumer goods. This meant that their existing foreign exchange reserves were quickly used up, with current export earnings being unable to fill the gap between demand and supply at existing exchange rates. Consequently, most of these countries felt forced to impose foreign exchange and import controls to conserve their available export earnings and to establish a rationing system for the available foreign exchange to ensure that consumer necessities such as food and medicine, key intermediate inputs such as fuel, and essential capital goods could be imported in sufficient quantities to prevent serious political unrest and still permit the pursuit of their development goals. One consequence was that very high levels of implicit protection were put in place on so-called "nonessential" manufactured goods.

B.   *The failure of import substitution policies*

9.   Import substitution policies actually worked quite well initially. The high prices of imported nonessentials shifted domestic demand for these goods from foreign to local producers with the result that there were significant increases in the output of simple manufactured goods as governments provided domestic producers with the foreign exchange needed to import key intermediate inputs and capital goods. Many manufacturing activities consisted largely of simply assembling the components of goods produced abroad, *e.g.* cars. Since the production of most of these products intensively utilised the type of labour that was relatively abundant in the newly industrialising nations, namely, unskilled labour, the adverse effects on economic efficiency of these early import substitution efforts were not sufficient to offset the growth effects of the import substitution policies. Moreover, in this early period, the overvalued domestic currencies resulting from the tight exchange controls and expansionary production policies not only did not seem to reduce earnings from primary-product exports significantly but kept import prices of needed capital goods and intermediate inputs relatively low.

10.   As import substitution policies continued and a number of developing countries extended these policies to cover more and more intermediate inputs and capital goods, the drawbacks of such a policy approach became increasingly apparent. In particular, the hardships imposed on the export sector began to have adverse growth effects. An overvalued currency meant that the number of units of foreign exchange received by exporters remained low while, at the same time, these producers were forced to purchase more and more intermediate inputs and capital goods domestically at high prices. The resulting squeeze on profit

margins forced them to curtail export production. The higher skill and technology requirements for the more complex intermediates and capital goods and lack of large domestic markets needed to achieve efficient levels of production of these goods also worsened the profit outlook for domestic producers. At the same time, aggressive expansionary activities by governments and private businesses fuelled greater inflationary pressures with the result that large government budget deficits and balance-of-payments deficits became commonplace. The ensuing budget and balance-of-payments crises were often met by still tighter controls over exchange rates and imports and more extensive government intervention in the economy. The net outcome was generally a slowing in the growth rate compared to the early period of import substitution.

11.   Given the widespread agreement among economists today that that the import substitution strategy for did not work out well for most developing countries, an important question to ask is why so many economists were wrong in their predictions that such an approach would be successful in raising long-run growth rates for these countries. What went wrong with our analytical thinking? In my view, two mistakes we made were an uncritical acceptance of the infant industry argument and a failure to take account of the macroeconomic consequences of such a policy when applied to all manufacturing.

C.   What went wrong with the policy advice of economists?

12.   Consider the argument set forth earlier that new producers need to be protected for a temporary period so they can acquire the experience and production skills that will make them as efficient as their long-time foreign competitors. As James Meade (1955) pointed out many years ago, the existence during the early period of production of higher costs than foreign competitors is, by itself, an insufficient reason to justify tariff protection on economic efficiency grounds. If unit costs in an industry are enough lower after the learning period to yield a discounted surplus of revenues over costs (and thus indicate a comparative advantage for the country in producing the product), it should be possible for firms to raise sufficient funds in the capital market to cover their initial excess of expenditures over revenues. These circumstances are no different from those in which firms go to the capital market for funds to cover the excess of expenditures over receipts during the early stages of production because of the need to purchase indivisible units of physical capital. Imperfections in capital markets may prevent access to capital markets but the existence of market imperfections is a quite different case for government intervention than the infant industry argument.

13.   As Meade (1955) also noted, the key argument on which the infant industry case must rest relates to technological externalities associated with the learning process. For example, consider the matter of acquiring the knowledge about local production techniques needed to compete effectively with foreign producers. An entrepreneur who incurs these costs of discovering the best way to produce a particular good faces the problem that this information may become freely available to other potential local producers, who can utilise it at the same time as the initial firm but without incurring the full costs of the knowledge acquisition. Competition from these other producers could then either drive up factor prices or push down the product's price to levels where the initial firm is unable to recover its costs of gaining this knowledge. Realising that this outcome is possible, firms will be discouraged from undertaking the initial knowledge-acquisition costs.

14.   The imposition of a temporary protective duty is, however, no guarantee that individual entrepreneurs will undertake additional investment in knowledge acquisition. An import tax raises the domestic price of a product and, from the viewpoint of the industry as a whole, makes some investments in knowledge more profitable. But individual producers still face the same externality problem as before, namely, that other firms will copy, with little cost to themselves, any new technical knowledge discovered by the firm and drive the product's price down to a level where the initial firm will be unable to recoup its

costs of acquiring this knowledge. If there were always some technologically fixed time lag between the introduction of a new, cheaper production technique and the change in product or factor prices caused by the entry of the firms who copy the new production method, a duty would operate to make investment in knowledge acquisition more profitable for the individual firm in the industry. But, to make a point too often ignored in such discussions, the speed with which firms respond to market opportunities is itself a function of the level of profit prospects. A duty will make it worthwhile for firms to incur any costs of acquiring the knowledge discovered by other firms faster and also to move into production more rapidly at high output levels. What is needed, of course, is a subsidy to the initial entrants into the industry for the purpose of discovering the better production techniques.[3]

15.   Up to the post-World War II period when some economists began to extend the infant industry argument to all manufacturing, economists had generally framed this argument for temporary protection in partial equilibrium terms. It focused on a single industry, and it was assumed that the temporary import protection granted had no appreciable effect on such macroeconomic variables as exchange rates, aggregate exports and imports, and monetary or fiscal policies. Early proponents of aggressively protecting large segments of the manufacturing sector did not fully appreciate the implications of their policy suggestions on these macroeconomic variables. They did not, for example, take sufficient account of the adverse effects of import substitution on aggregate exports and, thus, on the foreign exchange earnings so essential for importing the capital goods and essential intermediate inputs needed to permit the expansion of the manufacturing sector. Nor did they realise the extent to which government actions to conserve foreign exchange by limiting imports of luxury consumer goods would make the domestic production of these goods the most attractive for domestic entrepreneurs and thus bias the pattern of production in a direction that the government did not particularly want. They also failed to appreciate the extent of the budget and inflationary pressures that would be generated by the development actions of governments and domestic producers. Indeed, it was the macroeconomic crises associated with unsustainable import deficits for central banks, unmanageable government budget deficits, runaway inflation, etc. that had the greater effect in finally turning most countries away from import substitution policies than a realisation of the serious resource misallocation effects of these policies.

III.   The shift to outward-oriented policies

16.   The first group of developing countries to shift from an inward-oriented to outward-oriented approach to development were located in the Far East, specifically Taiwan, Singapore and South Korea. (Hong Kong had long pursued open trade and investment policies.) South Korea, for example, was characterised by extensive quantitative controls over trade and international payments from the time it separated from North Korea in 1945 through the end of the Korean War in 1953. Inward-looking actions continued to dominate government development policy after 1953, with an increasingly elaborate multiple exchange rate system being established in the attempt to deal with the problems of a large trade deficit and an overvalued exchange rate.[4] While a large currency devaluation took place in 1961 along with efforts to liberalise the trade and payments system, this liberalisation effort ended in 1963 as rapid inflation was fed by excessively expansionary fiscal policies and a poor crop. However, a further liberalisation effort begun in 1964 and 1965 was much more successful so that by 1966 the trade and payments regime was fairly liberal compared with earlier years. The country became increasingly outward-oriented as the government adopted other policies that encouraged exports of manufactured goods.

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3.   For a further discussion of this and other aspects of the infant industry case, see Baldwin, 1969.

4.   See Frank, Kim and Westphal (1975) for a detailed discussion of Korea's development experience during this period.

17.   Even though they undertook periodic attempts to liberalise their trade and payments regimes, most other developing countries continued to follow what was basically an import substitution approach to growth until the 1980s. However, the debt crisis of 1982 convinced many developing-country governments that inward-looking policies were no longer sustainable, particularly for smaller countries. They had borrowed heavily in international markets in order to cope with the trade-deficit problem associated with the import substitution approach only to find that the high and sustainable growth rates sought still did not materialise and, instead, that they were left with massive international debts they could no longer service. Such traditional adherents to the import substitution approach as Argentina, Chile, Mexico, Turkey, Ghana, and Uganda began to adopt more outward-looking policies.

18.   While the inability to borrow the funds needed to re-establish their import-substitution regimes and the remarkable growth record of more and more East Asian countries under outward-oriented policies were probably the main immediate reasons for the shift in growth policy, the gradual shift in thinking by economists both in academia and in international organisations such as the World Bank, the International Monetary Fund and even the United Nations Commission for Latin America in favour of outward-looking over inward-looking policies also was an important factor.

A.   Country-specific studies and early cross-country analyses

19.   This change in conventional thinking by economists and policymakers about the best policy approach to promote growth in the developing countries was significantly influenced by a series of detailed country studies together with some cross-country statistical analyses of the import substitution process and by new theoretical modelling of the interactions between trade and growth. Both the studies of commercial policies in developing countries directed by Ian Little, Tibor Scitovsky, and Maurice Scott (1970) and by Bela Belassa (1971) utilised the newly formalised concept of the effective rate of protection to compare import substitution policies across industries and countries.[5] This concept measures protection on a value-added basis rather than on the basis of the final price of a product and thus takes account of the level of protection on intermediate inputs as well as the final product. It brings out the point that, if a good is exported without any export subsidy but the exporter must purchase protected domestically-produced intermediate inputs, the primary factors involved in the value-added process are actually penalised compared to free trade. Similarly, if there are no duties on the intermediate inputs or they are lower than those on the final product are, the primary factors producing the value-added are protected to a greater degree than the rate of protection on the final product indicates.

20.   Both the Little, Scitovsky and Scott (1970) and Belassa (1971) studies brought out the fact that the average rate of protection of value-added in manufacturing was extraordinarily high in most developing countries - - much higher than nominal rates of protection and often exceeding 100 percent. Moreover, there was great variability among industries and broad sectors that often seemed to make little economic sense. An extreme example was Chile's effective rate of protection in 1961 of 2,884 percent for processed foods in contrast to 300 percent for nondurable consumer goods (Belassa, 1971, p. 54). Perhaps, most important, however, was the degree to which the studies demonstrated the discrimination against exports, mainly agricultural and mineral products. In some countries, there actually were negative rates of protection in these sectors, *e.g.* agriculture in Pakistan and mining and energy in Malaysia (see Belassa, 1971, p.54). Both sets of studies recommended reducing the average levels of effective protection and, in particular, reducing the discrimination against exports.

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5.   The countries covered by the studies directed by Little, Scitovsky and Scott were Argentina, Brazil, India, Mexico, Pakistan, the Philippines, and Taiwan, while those investigated by the Balassa and his associates were Brazil, Chile, Mexico, Malaysia, Pakistan, the Philippines, and for comparison, a developed country, Norway.

21.   Two other noteworthy studies of developing countries were ones directed by Anne Krueger (1978) and Jagdish Bhagwati (1978) and by Demetris Papageorgiou, Michael Michaely, and Armeane Choksi (1991). These studies investigated particular episodes of inward-looking and outward-looking policy actions by considering not only changes in levels of import protection and export subsidisation but the array of macroeconomic policies utilised by governments, e.g., monetary policy, fiscal policy, and, especially, exchange rate policy, to promote import substitution or deal with its consequences. The Bhagwati-Krueger project focused on the effective exchange rates faced by importers and exporters, *i.e.* the nominal rates for imports and exports corrected for various export subsidies and for import tariffs and nontariff barriers, respectively.[6] Following broad guidelines, the individual country-researchers in the Papageorgiou-Michaely-Choksi study were asked to construct an annual index of the degree of trade liberalisation.[7] Both these sets of studies reached the same conclusion as the two earlier ones, namely, that import-substitution policies generally do not produce sustainable increases in long-run growth rates and that outward-looking policies are more appropriate for achieving this goal. They also both go into considerable detail about the process of moving from an inward-looking to outward-looking policies and, in particular, the sequencing of trade and exchange-rate liberalisation and the set of other policies, such as monetary, fiscal and competition policies, that should accompany the liberalisation process.

22.   There were also cross-country econometric studies in the 1970s and 1980s that attempted to test the relationship between trade and economic growth. For example, using information from the country-studies he directed, Belassa (1978) regressed the growth rate of exports on the growth of output, both including and excluding exports from the measure of output. He found the strongest positive relationship when exports are included as part of output, but he also found a generally significant positive effect when exports are excluded from GNP. Krueger (1978, Ch. 11) also finds that when the growth of exports was faster the growth of GNP was also faster. She did not find, however, that the extent of trade and exchange rate liberalisation independently affects growth. Using data based on the indices of liberalisation in the Papageorgiou-Michaely-Choksi study, Ioannis Kessides (1991) runs a number of regressions relating liberalisation and growth. Among his findings are that strong liberalisation episodes are associated with higher increases in the rate of GDP growth than weaker episodes and that countries with sustained liberalisation episodes experienced larger increases in the rates of GDP growth than countries with failed liberalisation episodes.

B.   *Conclusions from these studies*

23.   As this brief survey of individual country studies and cross-country statistical analyses of inward-looking versus outward-looking policies indicates, the many differences among researchers in the issues focussed on and in the economic techniques employed make is difficult to draw many firm conclusions. One generalisation that seem warranted is that the import-substitution approach was not successful in promoting appreciably higher growth rates on a long-run, sustainable basis for developing countries that still wanted to participate in the global economy. Most countries that used this approach were forced eventually to abandon it because of chronic balance-of-payments and budget-deficit problems. Those that have basically stuck with an inward-looking approach over the years, *e.g.* India and Pakistan, have had relatively lower growth rates. In contrast, although many developing countries that switched to outward-looking policies were also often forced to abandon these policies temporarily because of unexpected

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6.   This study resulted in published volumes that analyzed Chile, Colombia, Egypt, Ghana, India, Israel, Korea, the Philippines, and Turkey.

7.   The countries included in this effort were Argentina, Brazil, Chile, Columbia, Greece, Indonesia, Israel, Korea, New Zealand, Pakistan, Peru, the Philippines, Portugal, Singapore, Spain, Sri Lanka, Turkey, Uruguay, and Yugoslavia. Most studies covered the period from around 1950 to the early 1980s.

external events or domestic political pressures related to the adjustment problems involved, those that were able to sustain these policies over long periods seem to have grown more rapidly. Another point that stands out in the various country studies is that outward-looking and inward-looking policies involve much more than just trade and trade policies. For example, a willingness to welcome foreign direct investment, to maintain market-oriented exchange rates, to keep the money supply under fairly tight control, to constrain government budget deficits and corruption, and to control monopolistic behaviour by firms and industries all seem to be important components of outward-looking development policies. Attempting to isolate the relative importance on growth of a particular component such as the volume of exports or liberal versus protectionist trade policies does not seem to make much sense, since there are complex interrelationship among these types of policies that make them highly inter-correlated. In his influential review of the various investigations of trade and growth through the early 1990s, Sebastian Edwards (1993) is especially critical of the cross-country statistical studies, which he argues are based on overly simplistic theoretical models and also are flawed for various econometric reasons.

24.   Not much light has been shed in the various studies on the matter of the direction of causality. For example, does an increase in the growth rate of exports increase the rate of growth of GDP or does causality run in the other direction?[8] Moreover, even is one could show that increased exports raises a country's overall growth rate, this still leave the matter of what caused the increased exports. Still another point that comes out in some of the country studies is that outward-looking policies do not necessarily involve less government intervention than inward-looking policies.

IV.   Theoretical developments: The new trade theory

25.   An important analytical development in the latter part of the 1980s and early 1990s was the significant improvement in the theory of endogenous growth by such authors as Paul Roomer (1986), Robert Lucas (1988) and Gene Grossman and Elhanan Helpman (1991). Part of this new growth theory focussed on the relationships between international trade and growth. One of the models of Grossman and Helpman (1991, Ch. 6) illustrates the types of relationships stressed in the new growth theory and, in particular, how trade policy can affect growth rates. To keep the model as simple as possible, they assume that each country is "small" in the sense of facing fixed world prices for the two final goods produced. There are two factors of production, human capital (skilled labour) and unskilled labour whose supplies are fixed. One of the final goods is produced with human capital and a fixed amount of differentiated, nontraded intermediate inputs, while the other is produced with unskilled labour and the same bundle of intermediate inputs. The nontraded intermediate inputs are produced under monopolistically competitive conditions with both factors of production. Constant returns to scale prevail for final and intermediate goods.

26.   Human capital is also involved in the research and development activities that create the new varieties of intermediate goods. These intermediate inputs are the key to increased productivity: each final good requires a given aggregate of intermediates but the more varieties there are in this aggregate, the higher output becomes. This captures the idea that dividing tasks into smaller and smaller parts through specialisation leads to increasing returns. Another important aspect of the R&D process is that it not only produces new varieties of intermediates but also adds to the stock of knowledge, which is non-appropriable. The greater this stock of knowledge, the less the quantity of human capital needed to produce new varieties of intermediate inputs. Thus, the growth process is endogenous with R&D creating new intermediate inputs that increase the productivity of the needed aggregate of inputs and also add to the stock of general knowledge. In turn, the larger the stock of knowledge reduces the amount of human

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8.   In summarizing previous studies on the direction of causality between openness and growth, Harrison (1996) describes the results as "mixed." Her own test suggests that causality runs in both directions.

capital needed for producing new varieties of intermediates. The equilibrium outcome is a constant rate of growth of factor productivity and a constant rate of output growth in the sectors producing the final goods.

27.   Now consider the effects of a tariff on the imported good. If the country is importing the good that only uses human capital as a direct input and exporting the good intensively using unskilled labour, the import duty will raise the relative domestic price of the human capital-intensive good and via the Stolper-Samuelson theorem raise the relative wages of skilled labour. This increase in the price of human capital will lower the level of R&D activity by raising its costs and thus lead to a lower equilibrium growth rate. In contrast, if the country imports the unskilled labour-intensive goods, import protection will lower the relative wages of skilled labour and accelerate the growth rate. Thus, in this model there is no definite answer to whether protection increases or decreases the growth rate. It depends on the pattern of imports and exports. Besides using the concept of increasing returns as the driving force for endogenous growth, Grossman and Helpman (1991) and other growth theorists have introduced such concepts as knowledge spillovers resulting from trade in goods and foreign direct investment as well as the ability to imitate the products of foreign producers as engines of endogenous growth. Import protection generally reduces growth rates under these formulations.

V.   Later cross-country analyses and criticisms by Rodriguez and Rodrik

28.   Motivated by the improvements in growth theory, the criticisms of earlier statistical analyses, and the availability of more comprehensive data, economists devoted renewed attention in the 1990s to more sophisticated cross-country econometric analyses relating various measures of "outwardness" or "openness" to the growth rates of GDP or total factor productivity. Almost all of these studies find a strong positive relationship between outward-looking policies and growth. However, in a recent detailed review of the most influential of these studies in which they focus on the effects of policy-induced trade barriers on growth rather than on the growth effects of more general measures of openness, Francisco Rodriguez and Dani Rodrik (1999, pp. 38-39) express scepticism "that there is a strong negative relationship in the data between trade barriers and economic growth, at least for levels of trade restrictions observed in practice." Moreover (p. 39), they "view the search for such a relationship as futile." A unique feature of the Rodriguez-Rodrik analysis is that they use the various authors' actual data sets in undertaking various tests of the robustness of their results. This section examines the main studies reviewed by Rodriguez and Rodrik (1999) and considers the criticisms they make of these studies.

A.   *David Dollar (1992)*

29.   As Rodriguez and Rodrik point out, one of the most widely cited statistical investigations of outward orientation and growth is by David Dollar (1992). (This paper was not covered in Edward's 1993 review.) Dollar bases his measure of outward orientation on estimates of the comparative price levels in 95 countries of an identical bundle of consumption goods calculated by Robert Summers and Alan Heston (1988). As a means for eliminating that part of the differences in prices among countries due to country differences in the prices of nontradeables, Dollar first regresses their price estimates on the level and square of GDP per capita as well as regional dummies and then compares the predicted price levels from this regression with the Summer-Heston prices. The argument is that if factor prices are not equalised, the relative prices of nontradables should vary systematically with differences in relative factor endowments. Since good data on relative factor endowments is not available for most less developed countries, he uses per capita income as a measure of per capita factor availability. Even with this procedure, he still finds significant anomalies for some countries with respect to the degree of trade distortion produced by his comparative price measure. However, when he combine this trade-distortion measure with a measure of the degree of volatility of exchange rates, he finds that the number of anomalies declines substantially.

30.   Trade economists have often explored the possibility of measuring the degree of import protection or export subsidisation by comparing domestic prices across countries for specific traded goods. However, this has generally been rejected as an adequate method of measuring trade barriers, since even for physically identical goods for which detailed direct information on levels of protection or subsidisation exists, price differences are generally not good measures of differences in the degree of trade distortions. Given this result and the rather rough method used to purge the effects of the prices of nontradeable in the Summers-Heston price measures, it is not surprising that Dollar finds that his price indices do not yield reasonable results for a number of countries. Combining these indices with a measure of the volatility of exchange rates may give more reasonable results but, as Rodriguez and Rodrik argue, his variability index seems to be more a measure of economic instability at large rather than of trade orientation alone.

31.   To test for the relationship between growth and his measures of outward orientation, Dollar regresses growth in per capita income in 95 countries averaged over the period 1976-85 on his trade distortion and exchange rate volatility measures as well as the rate of investment in these countries over the same period. He finds that the higher the level of trade distortion and the greater the exchange rate variability for a country, the lower the rate of per capita GDP growth. However, Rodriguez and Rodrik find that the results for the trade distortion index are not very robust to alternative specification of the growth equation. For example, when dummy variables for added for Latin America, East Asia, and Sub-Saharan Africa, the trade distortion measure is not statistically significant. Adding initial per capita income and level of education reduces the explanatory power of this variable even more. Furthermore, when Rodriguez and Rodrik use the latest revision of the Summers and Heston data base for the same countries and time period covered by Dollar, the trade distortion index is not significant and has the wrong sign even without the addition of regional dummies. However, the exchange rate variability index continues to be negative and statistically significant under all specifications using both with the new and old database. Thus, while Dollar has shown that exchange rate variability is negatively associated with growth rates, I agree with Rodriguez and Rodrik that he has not demonstrated that outward orientation as one would expect this to be affected by trade policies is significantly related to economic growth in the developing countries he studied.

B.   *Jeffrey Sachs and Andrew Warner (1995)*

32.   The next, equally influential study critiqued by Rodriguez and Rodrik is by Jeffrey Sachs and Andrew Warner (1995). These authors construct a zero-one dummy of openness for 79 countries that takes a zero if any one of the following conditions holds over the period 1970-89: average tariff rate are over 40 percent, nontariff barriers cover 40 per cent or more of imports, the country operates under a socialist economic system, there is a state monopoly of the country's major exports, and the black market premium on its official exchange rate exceeded 20 per cent in the 1980s or 1990s. A value of zero is viewed as indicating a closed economy, while a value of 1 indicates an open economy. Controlling for such variables as the investment rate, government spending as a fraction of GDP, secondary and primary schooling, and number of revolutions and coups, Sachs and Warner find their openness index to be negatively related to the growth rate of per capita GDP in a statistically significant sense.

33.   In reanalysing the Sachs-Warner data, Rodriguez and Rodrik find that two of the six indicators provide most of this statistical significance: the existence of a state monopoly of the country's major exports and a black market foreign exchange premium of more than 20 per cent. (Neither the measure of tariff levels or the coverage of nontariff trade barriers is statistically significant when the different indicators of openness are entered separately.) Moreover, they note that the state monopoly variable only covers 29 African countries undergoing structural adjustment programs in the late 1980s and early 1990s and, therefore, is virtually indistinguishable from the use of a Sub-Saharan Africa dummy. As for the

statistical significance of the black-market premium, they argue that this indicator is likely to be a measure of policy failure due to many other reasons besides simply trade policy.

C.   *Sebatian Edwards (1998)*

34.   The last paper to be discussed here is one by Sebatian Edwards (1998), the author of the review of the various studies on the trade and growth through the 1980s and early 1990s mentioned earlier, i.e., Edwards (1993). One of his main criticisms in that paper of the cross-country statistical studies in that period is their failure to test in a systematic way for the robustness of the results obtained. In his 1998 paper, Edwards tries to remedy this shortcoming. He tests the robustness of the extent to which nine different measures of trade policy are related to total factor productivity growth. His nine measures of openness are: i) the Warner-Sachs index just discussed; ii) a subjective World Bank classification of trade strategies; iii) Edward Leamer's (1988) index of openness based on the residuals from regressions explaining trade flows; iv) the average black market premium on a country's official foreign exchange rate; v) average levels of import tariffs calculated by UNCTAD and taken from Barro and Lee (1994); vi) the average coverage of nontariff trade barriers taken from the same source; vii) a subjective index of trade distortions formulated by the Heritage Foundation; viii) the ratio of taxes on imports and exports to total trade; and ix) a regression-based index of import distortions calculated by Holger Wolf (1993). He regresses these nine different measures of openness on estimates that he calculates of ten-year averages of total factor productivity from 1960-90 for 93 developed and developing countries. Controlling for initial per capita GDP in 1965 and the average number of years of education in 1965, he finds that six of the nine measures of openness are statistically significant in the expected direction.

35.   Rather ironically, given Edward's emphasis on the need to test for robustness by using alternative specifications, Rodriguez and Rodrik find that his results are heavily dependent on the fact that he weighs his regressions by per capita GDP. If one weighs by the log of per capita GDP or uses White's (1980) method of dealing with the heteroskedasticity problem, the number Edward's nine openness measures that are significant drops to five and four, respectively. The four significant openness measures that are significant when White's correction for heteroskedasticity is used are the World Bank's subjective classification of trade regimes, the black market exchange-rate premium, the subjective index of trade distortions calculated by the Heritage Foundation, and the ratio of trade taxes to total trade. With respect to the latter variable, Rodriguez and Rodrik find that recalculating this variable based on more recent data than was not available to Edwards fails to yield a significant sign when introduced into the regression on total factor productivity. They also note that the Heritage Foundation index was calculated for trade restrictions existing in 1996, whereas Edward's estimates cover the decade of the 1980s. When they calculate a similar index that is based on 1980s data, it is no long statistically significant in explaining the growth rate of total factor productivity. They also object to the use of this measure as well as the one from the World Bank as being subjective measures that they believe are "apparently highly contaminated by judgement biases or lack robustness to use of more credible information from alternative data sources" (p. 28). Finally, as mentioned earlier, they regard changes in the exchange rate premium as being influenced more by basic macroeconomic policies than trade policies.

VI.   Conclusions

36.   What are we to conclude from this survey of studies about the relationships between trade and growth, besides the fact that there is considerable disagreement among economists on the issue? I would agree with Rodriguez and Rodrik that the available evidence does not demonstrate a strong negative relationship between growth and trade policies, where the latter term is narrowly defined as covering trade taxes and subsidies and other trade-distorting measures specifically aimed at restricting imports or

promoting exports, *e.g.* quotas on particular imports or exports, but excluding macroeconomic policies such as exchange-rate, government- budget, and monetary policies that also affect the pattern of trade but are mainly aimed at achieving broader macroeconomic goals. For example, the usual direct measures of trade policy, namely, the average level of tariffs and export subsidies and the levels or product-coverage of traditional nontariff measures are generally not related to growth of output or factor productivity in a statistically significant manner.

37.   From an analytical viewpoint, this should not be regarded as a surprising result. We know from both classical and neoclassical trade theory as well as modern growth theory that import protection, for example, can promote or retard growth depending upon the economic circumstances. We also have historical evidence that protection seems to be able to promote growth over long periods in particular industries and that even broad import-substitution policies can accelerate general growth in the early stage of their use.

38.   The lack of a statistically significant relationship between tariff and nontariff measures and the rate of economic growth should not be interpreted, however, as indicating those international economic policies in general or international trade have only an insignificant effect on growth. Consider the robust negative relationship that seems to exist between economic growth and the volatility of a country's exchange rate and its black market premium. These variables clearly are influenced by a government's exchange rate policies. However, the volatility or overvaluation of national currencies can come about for such diverse reasons as deliberate efforts of the government to manipulate the exchange rate for economic growth purposes, from other government actions such as increased budget deficits and money supply increases designed to achieve some other economic goal, *e.g.* income redistribution, or from domestic and international economic or political events over which the country's economic policymakers have very little control. The basic causes of the exchange rate changes can sometimes be sorted out fairly well by undertaking careful case studies of particular episodes, but personal judgements that may not be shared by other researchers are always involved in such studies. Moreover, even if the exchange rate changes were initially motivated by the goal of faster economic growth, other macroeconomic changes, e.g., increases in the money supply or government budget deficit, set off by the initial exchange rate change may be more important in producing the exchange rate volatility or a large black market premium. It seems unlikely, moreover, that sufficient data of adequate quality and impartiality can be collected to sort out by means of cross-country statistical studies the relative importance of the various possible initial causes and the other policy changes they generate.

39.   The statistical finding that increases in exports and increased growth are generally positively related in a significant statistical sense involves the same types of problems. The export increase may be result of trade policy changes, other nontrade policy actions, or forces unrelated to a government's policy actions. As noted earlier, the export increase also may be the consequence of economic growth rather than the cause. Furthermore, the use of exports as an openness measure has the drawback of being a component of GDP, the usual measure of economic growth.

40.   Consequently, as Rodriguez and Rodrik argue, not only does the search for the relationship between trade barriers and growth seem futile, but it does not seem to make much sense in view of the complex interrelationships between trade policy and other government policies and various macroeconomic variables when one is talking about trade policy actions covering a wide group of goods, *e.g.* manufactures, rather than a particular industry. Actually most of the country studies, particularly the later ones, have been concerned with government policies that cover much more than narrowly-defined trade barriers to international trade. The country studies led by Bhagwati-Krueger and Papageorgiou-Michaely-Choksi specifically focus on exchange rates as well as trade barriers and also examine the monetary, fiscal and regulatory policies that accompanied market-opening or market-closing episodes. This is why these writers and those undertaking cross-country statistical studies use such broad terms as

liberalisation, outward-orientation, and openness and characterise particular regimes and episodes as consisting of much more than just trade policy behaviour.

41.   It is true developing countries are often given the policy advise that decreasing trade barriers is a more effective way of achieving higher sustainable rates of growth than tightening trade restrictions. But, especially since the Bhagwati-Krueger and Papageorgiou-Michaely-Choksi country studies, those giving such advise also emphasise the need, as a minimum, for a stable and non-discriminatory exchange-rate system and usually also the need for prudent monetary and fiscal policies and corruption-free administration of economic policies for trade liberalisation to be effective in the long-run. It seems to me that the various country studies do support this type of policy advice and that the cross-country statistical studies do not overturn this conclusion. But the recent critiques of these latter studies demonstrate that we must be careful in attributing any single economic policy, such as the lowering of trade barriers, as being a sufficient government action for accelerating the rate of economic growth.

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