Integration of Trade and Disintegration of Production in the Global Economy

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Abstract

The last few decades have seen a spectacular integration of the global economy through trade. The rising integration of world markets has brought with it a disintegration of the production process, however, as manufacturing or services activities done abroad are combined with those performed at home. I compare several different measures of foreign outsourcing, and argue that they have all increased since the 1970s. I also consider the implications of globalization for employment and wages of low-skilled workers, and for trade and regulatory policy, such as labor standards.

The last few decades have seen a spectacular integration of the global economy through trade. The share of imports (or exports) in GDP for the United States has approximately doubled in the last two decades, and if intra-OECD trade is omitted, the same is true for the OECD countries generally. Trade does remain a seemingly small fraction of U.S. GDP. This is not surprising in view of the fact that large economies trade less with others, and more internally. But the modest share of trade in total national income hides the fact that merchandise trade as a share of merchandise value-added is quite high for the U.S. and the OECD, and has been growing dramatically. In fact, if one focuses on merchandise trade relative to value-added, the world is *much* more integrated today than at any time during the past century.

The rising *integration* of world markets has brought with it a *disintegration* of the production process, in which manufacturing or services activities done abroad are combined with those performed at home. Companies are now finding it profitable to outsource increasing amounts of the production process, a process which can happen either domestically or abroad. This represents a breakdown in the vertically-integrated mode of production – the so-called "Fordist" production, exemplified by the automobile industry – on which American manufacturing was built. A number of prominent researchers have referred to the importance of the idea that production occurs internationally: Bhagwati and Dehejia (1994) call this "kaleidoscope comparative advantage," as firms shift location quickly; Krugman (1996) uses the phrase "slicing the value chain"; Leamer (1996) prefers "delocalization;" while Antweiler and Trefler (1997) introduce "intra-mediate trade." There is no single measure that captures the full range of these activities, but I shall compare several different measures of foreign outsourcing, and argue that they have all increased since the 1970s.

I then consider the implications of globalization. Of principal interest is the impact on employment and wages of low-skilled workers. Although this topic has already received much discussion and review,[1] I believe that the fundamental importance of outsourcing is still not recognized. The debate is sometimes framed as evaluating "trade" versus "technology" as alternative explanations for the falling real income of low-skilled workers. In fact, I will argue that by allowing for trade in intermediate inputs, globalization has an impact on employment and wages that are *observationally equivalent* to the changes induced by technological innovation. The idea that globalization has a minor impact on wages relies on a conceptual model that allows only trade in final goods, thereby downplaying or ignoring the outsourcing of production activities. The empirical evidence supports a much more prominent role for the optimal decisions of firms to allocate production worldwide, that needs to be incorporated into our theoretical framework.

I also consider the implications of the disintegration of the production process for trade and regulatory policy, including labor standards. Only a few years ago business was calling for a "level playing field," but that cry is seldom heard now: the playing field *has been* leveled, at least for manufacturing firms, through rapid capital mobility. Any corporation that would like to take advantage of regulatory or trade policies in a foreign country can simply move or sub-contract through a firm located there. Rather than a "level playing field" for business, the policy issue now is international "harmonization" of regulations that affect labor and also the environment (Bhagwati and Hudec, 1997). An example is the Labor Side Agreement negotiated under the North American Free Trade Agreement, which I discuss. Policies such as this are a logical consequence of the

1. For discussion of the links between trade and wages in this journal, see the articles in the symposia on "Income Inequality and Trade" in the Summer 1995 issue of this journal, and in the symposium on

fundamental changes in the global economy, whereby companies spread their production activities worldwide, and will set the stage for trade negotiations in the years to come.

Integration of Trade

The decades leading up to 1913 were a golden age of trade and investment worldwide. This was ended by World War I and the Great Depression, and it took many years to regain the same level of global integration. For most of the industrial countries shown in Table 1, the level of merchandise trade relative to GDP prevailing in 1913 was not obtained again until the late 1960s or 1970s, and some countries – like Australia, Denmark, Japan and the United Kingdom – still have not reached the earlier level. Krugman (1995, p. 331) uses numbers like these to conclude that " ... it would be hard to argue that the sheer volume of trade is now at a level that marks a qualitative difference from previous experience."

But the figures in Table 1 do not tell the whole story. The comparisons there are for industrial countries, that have had increasing shares of their economies devoted to services rather than "merchandise" trade like manufacturing, mining and agriculture. The rising share of services is usually explained by two factors: services are a luxury good, whose share rises with per capita income; and services have slower productivity growth than manufacturing, so that the relative price of services is increasing, and with an elasticity of substitution between services and other goods of less than unity, this implies faster growth of the service sector. To these explanations we can add a third possibility, advanced by Rodrik (1996): as the openness of an economy increases, so do government expenditures, needed in part to offset the external risks from trade. For all these reasons, the merchandise component of GDP is shrinking, so that merchandise trade relative to GDP is pulled down for this

reason.

To offer a different perspective, we measure merchandise trade relative to merchandise value-added, as Irwin (1996) does for the United States. Information of this type for various industrial countries is contained in Table 2. There are still two countries for which the ratio of merchandise trade to industry value-added was larger in 1913 than in 1990 (Japan and the United Kingdom) and one other for which this ratio changed little (Australia). But all the other countries have experienced substantial growth in trade relative to industry value-added since 1913: this ratio has increased by about one-third for Denmark and Norway and by three-quarters for Canada; has doubled for France, Germany, Italy, and Sweden; and has nearly tripled for the United States. Merchandise trade has indeed grown substantially relative to the production of these commodities in many countries.

What factors account for the growth in trade demonstrated in Table 2? Two possibilities that come to mind immediately are trade liberalization, and falling transportation costs. Estimates of their impact on bilateral trade of the OECD countries are provided by Baier and Bergstrand (1997) (see also Rose, 1991). The average level of bilateral trade grew twice as fast as country GDP in their sample, over 1958-1988. About two-fifths of the growth of trade relative to income is explained by the combined effect of falling tariffs and transport costs. Of these, falling tariffs were twice as important as falling transportation costs. Nevertheless, both are only partial explanations, leaving three-fifths of the growth in trade relative to income unexplained.

Another explanation for the growth in trade is that when economies become more similar in size, world trade increases, as demonstrated theoretically by Helpman (1987). Consider a world with three countries and a GDP of 120. If the three countries have GDP of 100, 10 and 10, respectively, then the maximum level of exports in this world is 40, when the small countries export all of GDP and

receive imports of an equal amount. However, if the three countries have GDP of 40 each, then the maximum level of exports in this world is 120. Thus, when countries become more similar in size, they import more product varieties from each other. This hypothesis has found considerable empirical support for the OECD and also non-OECD countries (Hummels and Levinsohn, 1995).

A final explanation, of particular relevance to this paper, is that the disintegration of production itself leads to more trade, as intermediate inputs cross borders several times during the manufacturing process. This leads to an upward bias in the ratios reported in Table 2, because while the denominator is value-added, the numerator is not, and will "double-count" trade in components and the finished product (e.g. automobile parts and finished autos are both included in trade between the United States and Canada). This is surely an important factor in the great surge in exports from the Asian newly-industrialized countries. As their economies have expanded, these countries have become producers of a vast array of consumer and industrial products, relying substantially on imported intermediate inputs. In some cases, these goods are marketed under the brand name of the company itself (such as Hyundai or Samsung, from Korea). But the majority of these goods have been purchased by companies in the importing country, and then marketed under their own brand names. This phenomenon under which foreign companies are engaged in "original equipment manufacturing" which is then resold under corporate brandnames in the west is a phenomena that took off during the 1980s. This is part of the "outsourcing" phenomenon, and in the next section I attempt to demonstrate its growth in recent years.

Disintegration of Production

As an example of outsourcing, consider the Barbie doll (Tempest, 1996). The raw materials

for the doll (plastic and hair) are obtained from Taiwan and Japan. Assembly used to be done in those countries, as well as the Philippines, but it has now migrated to lower-cost locations in Indonesia, Malaysia, and China. The molds themselves come from the United States, as do additional paints used in decorating the dolls. Other than labor, China supplies only the cotton cloth used for dresses. Of the $2 export value for the dolls when they leave Hong Kong for the United States, about 35 cents covers Chinese labor, 65 cents covers the cost of materials, and the remainder covers transportation and overhead, including profits earned in Hong Kong. The dolls sell for about $10 in the United States, of which Mattel earns at least $1, and the rest covers transportation, marketing, wholesaling and retailing in the U.S. The majority of value-added is therefore from U.S. activity. The dolls sell worldwide at the rate of two dolls every second, and this product alone accounted for $1.4 billion in sales for Mattel in 1995.

Another well-known example is Nike (Tisdale, 1994). About 75,000 people are employed in Asia in the production of shoes and clothing for Nike, though only a few hundred of these are actually employees of the company. The rest are employed in factories that have some contractual arrangement with Nike, possibly run by third parties, such as South Korean entrepreneurs. Along with this massive, albeit indirect, workforce in Asia, Nike has some 2,500 employees in the United States. The worldwide sales of Nike shoes generated profits of $360 million in 1993.

In what sense are these activities by Mattel and Nike different from the purchase of any other foreign toy or shoe by a American resident? The answer is that the outsourcing activities by these corporations support a very large U.S. presence: both Mattel and Nike do the design and marketing of their products in the United States. The activities outsourced by these corporations is part of their larger “value chain,” which include all the activities from the conception of a product to its final

delivery. It should be stressed at this point that these activities need not be internal to a firm, and as a result, looking within multinational firms alone does not give full perspective on what is happening. For example, Lawrence (1994) focuses on the imports of U.S. multinationals as one measure of outsourcing, and argues that changes in these imports are too small to be a cause of domestic wage and employment changes. Similarly, Krugman (1994) argues that flows of foreign direct investment through multinational firms are too small to account for observed wages and employment changes.[2] In contrast, I will adopt a general definition of outsourcing that, in addition to imports specifically by U.S. multinationals, includes all imported intermediate or final goods that are used in the production of an American firm, or sold under its brand name.

The question then becomes how to construct a data series that reflects the full range of industries and activities included within "outsourcing." Several different approaches can shed light on this phenomena. A starting point is to examine what has happened to the composition of U.S. trade using the "end-use" categories of the Bureau of Economic Analysis (as suggested by Irwin, 1996). Rather than assigning goods by their production process, these categories assign them according to their use by purchasers. The bulk of trade occurs in the five categories shown in Table 3: food, feeds and beverages; industrial supplies and materials; capital goods (except autos); consumer goods (except autos); and automotive vehicles and parts.[3]

The table shows U.S. trade shifting away from agriculture and raw materials, and towards manufactured goods in U.S. trade, as seen from the declining shares of foods, feeds and beverages, and

2. The use of U.S. multinational data to measure outsourcing also limits the generality of the results in Slaughter (1995), Brainard and Riker (1997) and Riker and Brainard (1997).

3. I omit petroleum products, which are distinguished separately for imports since 1967, and also "other" imports and exports, which include low-valued items, re-exports, certain military and other items.

industrial supplies and materials. Together, these categories accounted for over 90 percent of imports in 1925 and 1950, and less than 25 percent in 1990; the export share fell from about 80 percent to 35 percent over that time. The industrial supplies and materials should be thought of as mainly raw materials, with some basic manufactured goods such as steel, newsprint, textile yarns, and so on. Much more processing is done on the capital and consumer goods. The capital goods are used by firms for both investment (like machinery) but also are used as intermediate inputs. For example, all electrical parts and components, except finished consumer products, are included within capital goods. The consumer goods consist of finished household products, but there is still value-added on these goods in the United States, such as for advertising, marketing, and product development.

The share of capital plus consumer goods together have increased from 10 percent in imports and 15 percent in exports in 1925, to over 50 percent in 1990. Even in recent years, there has been a very substantial growth in imports of capital goods (including intermediate inputs), with the share increasing by more than half during the 1980s. These trends indicate that processed manufactured goods play an increasingly important role in U.S. trade. While some of these goods are sold directly to U.S. consumers, in many cases there will be additional value-added by American firms. Outsourcing takes on greatest significance when the products being imported are neither basic raw materials, nor finished consumer goods, but are at an intermediate stage of processing. In that case, it is very plausible that stages of the production process (or value chain) shift across borders as new trade opportunities emerge.

The data presented in Table 3 indicate that products are being imported into the United States at increasingly advanced stages of processing, which suggests that U.S. firms may have been substituting away from these processing activities at home. To confirm this hypothesis, we need to

obtain more direct evidence on outsourcing. One source of information is to identify the purchaser of the imports, and use this to draw inferences about the value-added on to the imports that occurs in the United States. The identity of importers and exporters is collected by the U.S. Customs Service, but this information is kept confidential. However, the Customs Service has published one study concerning the top 100 apparel importers, who collectively account for one-quarter of all apparel imports in 1993. Retailers such as JC Penney, Wal-Mart, The Limited, Kmart and Sears accounted for 48 percent of the value of these imports; another 22 percent went to U.S. apparel designers such as Liz Claiborne, Donna Karan, Calvin Klein and Ralph Lauren; while domestic producers make up an additional 20 percent of the total (Jones, 1995, pp. 25-26; Gereffi, 1998). Both apparel designers and domestic producers, together comprising 42 percent of the imports, are engaged in design and marketing functions. Large retailers are increasingly taking on this activity, as well. Only traditional wholesalers and traders – which make up the remaining 10 percent of these imports – are substantially divorced from the design and production process.

These numbers attest to the extensive outsourcing activities by U.S. apparel companies, and a similar description of buyers applies to European apparel imports (Gereffi, 1998). Within the footwear industry, too, 30 percent of all footwear imports in the United States in 1984 were purchased by manufacturers of shoes, who often market the products under the same brand name used to sell their U.S.-made footwear (Yoffie and Gomes-Casseres, 1994, p. 111). Many of these companies used imports as a means to shift the lowest-cost parts of the production process overseas. Such a trend can be seen for the textile, apparel and footwear industries taken together in Table 4, where we report the ratio of imported to domestic inputs for various OECD countries. These ratios show an increase for all countries from the early 1970s to the mid-1980s, and it can be expected that this trend has continued or

accelerated since then.

Table 4 illustrates how outsourcing can be measured by imported intermediate inputs within each industry. Some countries collect this information in the process of constructing input-output tables, although the United States does not. Nevertheless, imported intermediate inputs can be estimated for each U.S. industry by using the purchases of each type of input, and multiplying this by the economy-wide import share for that input. Summing this over all inputs used within each industry, we obtain estimated imported inputs, which can then be expressed relative to total intermediate input purchases. Feenstra and Hanson (1997) perform this calculation for U.S. manufacturing industries, and find that imported inputs have increased from 5.7 percent of total intermediate purchases in 1972 to 8.6 percent in 1979, and 13.9 percent in 1990.

Campa and Goldberg (1997) make the same calculation for Canada, Japan, the United Kingdom, and the United States, and their results for selected industries are shown in Table 5. The United States shows a doubling of the share of imported inputs between 1975 and 1995 for all manufacturing, though it is still at a low level compared to Canada and the United Kingdom, where over 20 percent of inputs were purchased from abroad in 1993. The United Kingdom shows an especially large absolute increase in foreign outsourcing. The upward trend for overall manufacturing is also displayed in the individual industries. The chemical industry has a lower share of imported inputs than overall, whereas machinery (non-electric and electric) and transportation equipment have higher shares in these three countries. The machinery and transportation industries have especially rapid growth in imported inputs, with many of the share doubling or even tripling between 1974 and 1993. The exception to these observations is Japan, where the share of imports in these heavy industries is lower than in overall manufacturing, and has generally been falling.

Imported intermediate inputs have also been computed for nine OECD countries by Hummels, Rapoport and Yi (1997), who use the term "vertical specialization" to describe the specialization of a country in particular segments of the value chain.[4] When inputs are imported, then processed, and the resulting product is exported, the total value of exports reflects more than just the value-added in that country. Their measure of vertical specialization equals the fraction of the total value of trade accounted for by inputs that are both imported and then embodied in exports.[5] This measure lies between zero, when imported inputs are not used in the production of exports, and unity, when all imports are re-exported, with minimal value-added.

Their findings show a rise in the values of vertical specialization for a number of countries between about 1970 and 1990: the U.S. value rises from 3.9 percent to 7.4 percent over those two decades; the United Kingdom, 14.3 percent to 19.1 percent; and France, 13.9 percent to 18.7 percent. Japan is a notable exception to the general trend, where the degree of vertical specialization drops from 7.3 percent in 1970 to 6.6 percent in 1990. The extent of vertical specialization varies a good deal across countries, being higher than 30 percent for the Netherlands; higher than 20 percent for Canada and Denmark; and between 10 and 20 percent for Germany, France and the United Kingdom. As for explaining the growth in exports for each country, Hummels, Rapoport and Yi (1997) find that nearly one-half of this growth is due to vertical specialization-based trade in Canada and the Netherlands; between one-quarter and one-third for France, Denmark and the U.K.; and smaller amounts for the

4. Arndt (1997, 1998a,b) uses "intra-product specialization" to describe the same phenomena.
5. On the import side, the imported intermediates that are used in the production of exports are measured by the product of imported intermediates and the fraction of gross production that is exported. On the export side, the factor-content of exports coming from imported intermediates is measured by the product of exports and the fraction of gross production that is imported intermediates. Vertical-specialization in trade equals the sum of these two terms, but since they are equal in value, it is equivalently measured as twice the value of either one.

U.S., Australia and Japan.

By a variety of measures, the increased use of imported inputs, and narrowing of production activities within each country, is a characteristic feature of many OECD countries over the past two decades.

Implications for Inequality of Wages

The decision of companies to source their production overseas will most certainly impact the employment of such firms at home, and can be expected to have different effects on skilled and unskilled workers. With firms in developed countries facing a higher relative wage for unskilled labor than that found abroad, the activities that are outsourced will be those that use a large amount of unskilled labor, such as assembly of components and other repetitive tasks. Moving these activities overseas will reduce the relative demand for unskilled labor in the developed country, in much the same way as replacing these workers with automated production. *This means that outsourcing has a qualitatively similar effect on reducing the demand for unskilled relative to skilled labor within an industry as does skill-biased technological change.*

This insight has several important implications. First, we should not assess the proximate cause of the decline in employment and wages of unskilled workers by attributing all within-industry shifts in labor demand to technology, and allowing trade to operate only via between-industry shifts. This was the approach taken by Lawrence and Slaughter (1993) and Berman, Bound and Griliches (1994), both of whom considered only trade in final goods. In that context, it is correct that international trade must affect labor demand through inter-industry shifts. But as soon as trade in intermediate inputs is permitted, as with outsourcing, then changes in the demand for labor within each industry can occur

due to trade, as well.

In fact, the whole distinction between "trade" versus "technology" becomes suspect when we think of corporations shifting activities overseas. The increase in outsourcing activity during the 1980s was in part related to improvements in communication technology and the speed with which product quality and design can be monitored, which was in turn related to the use of computers. A good example of this is the "retailing revolution" that has occurred during the 1980s, as with the development of large-scale discount stores such as Walmart and Target in the United States. The ability of these stores to offer lower prices has depended on an extensive system of outsourcing to low-wage countries, with new inventory methods and rapid communication allowing for design changes that are frequently needed in apparel. This illustrates that trade (through outsourcing) and technology (through computerized communication and inventories) are complementary rather than competing explanations for the changes in employment and wages in the import-competitive sectors.

Given the difficulties in obtaining accurate measures of outsourcing across industries, it is perhaps not surprising that attempts to measure the impact of trade on the employment and wages of skilled and unskilled workers have led to quite modest estimates. At the same time, attempts to directly measure the impact of information technology on employment and wages of skilled and unskilled workers directly – as opposed to treating the technology variable as a residual – have also found that this variable can explain only a fraction of the changes.[6] In this sense, technology and trade are on equal footing as being only *partial* explanations for rising wage inequality. In fact, the same

6. Feenstra and Hanson (1997) find that outsourcing accounts for 20 percent of the shift in relative employment towards skilled (non-production) workers in U.S. manufacturing during 1979-1990. In comparison, the increased use of computers and other high-technology equipment accounted for 30 percent of that shift. Using an alternative measure of computer investment, Autor, Katz and Krueger (1997) find that computers may explain as much as 30 to 50 percent of the increase in the relative demand for more-skilled workers since 1970, whereas outsourcing is insignificant.

reason is often given for such findings. Trade, it is often pointed out, still represents a relatively small fraction of GDP. And as Robert Gordon (1996, p. 267) has argued: "[P]art of the reasons that electronic computers have thus far failed to produce a TFP [total factor productivity] revolution is that they still represent a very small fraction of the capital stock."

Given that we cannot fully explain empirically the increase in wage inequality, it is important to think conceptually about these issue. There are a number of models that can be used to explore the impact of globalization on wages. One approach, for example, is to consider how skilled and unskilled labor are used in different intensities along "value chain" of a product, as in Feenstra and Hanson (1996). They find that outsourcing reduces the relative demand for unskilled labor, and this result applies both to the more developed economy that is shedding production activities, and to the developing economy that is receiving them. The reason is that the outsourced activities are unskilled labor-intensive relative to those done in the developed economy, but skilled-labor intensive relative to those done in the less developed economy. Moving these activities from one country to the other raises the average skill-intensity of production in *both* locations.

Another approach is to bring location decisions and transportation costs in to the picture explicitly. Markusen and Venables (1995, 1996a, b) allow multinational firm to choose their location of production, in a setting with high and low skilled labor into each country. They also find that multinationals can increase the skilled-unskilled wage gap in the high income country, and under some circumstances, in the low income country as well. Krugman and Venables (1995) analyze a model with trade in intermediate goods subject to transport costs. At medium levels of transport costs (low enough to promote trade but high enough to prevent factor price equalization), a core-periphery pattern emerges: countries in the core will have manufacturing agglomerated in them, while those in the

periphery suffer from a lack of industry and low wages. At lower levels of transport costs, the agglomeration of manufacturing in the core areas disappears, leading to a fall in wage inequality across regions.[7]

Yet another approach is to combine trade with explicit consideration of the factor market institutions in a country. For example, Davis (1996a, b, c) has considered the implications of globalization in a model that contrasts the flexible wages of American with the fixed wages of Europe. It turns out that the impact of globalization is very different than if wages are uniformly flexible; in particular, the brunt of the new supplying countries is borne by European unemployment when those wages are fixed, and does not affect American wages as would occur if both regions had flexible wages. For similar reasons, the impact of technological changes also depends on the prevailing factor markets institutions in each country, which serves to emphasize that the impact of globalization cannot be assessed independently of conditions in a country's trading partners.

Policy Issues

What should be the policy response, if any, to increased globalization and its impact on unskilled workers? To answer this, it is worthwhile to review the welfare criterion underlying any response to import competition, and existing trade laws that appear to act on the basis of these concerns.

At the heart of any policy action taken to protect individuals or firms from import competition is, I believe, the sense that people should be protected from undue losses as a result of international

7. Matsuyama (1996) demonstrates a similar pattern of agglomeration and uneven incomes across countries. Gao (1998) has extended this type of model to allow for multinational firms, and found that agglomeration breaks down more quickly (at higher levels of transport costs) due to these firms, leading to more equal incomes across countries.

trade. A strong version of this criterion would be what Max Corden (1974) has called the "conservative social welfare function," in which income is redistributed so that no one loses from an expansion of trade. In this spirit, existing trade policies attempt to compensate those individuals who have been harmed due to expansions or changes in the pattern of trade. This is not to say that all actors involved in the formulation of trade laws have this exact interest in mind, but rather, that one outcome of the bargaining process over trade laws is that something like the "conservative social welfare function" becomes an objective. (The question of whether there exists a more efficient set of instruments to achieve this objective will be taken up in the next section).

An example of this criterion in existing trade law is the so-called "escape clause" provision, or Section 201 of U.S. trade law, which mirrors Article XIX of the General Agreement on Trade and Tariffs (GATT). The original purpose of Article XIX and Section 201 was to offer protection for a limited period of time to industries and workers who faced import competition due to the multilateral reduction of tariffs under GATT. Later, the criterion to receive protection under Section 201 U.S. law was loosened to cover any industries facing an increase in imports, whether these were due to tariff reductions or not. Another example consistent with the "conservative social welfare function" is trade adjustment assistance, which offers special compensation to workers who are laid off due to import competition.

It is worth asking why workers and firms in trade-impact industries receive special compensation, while individuals experiencing economic hardship for other reasons do not. The answer is that both trade adjustment assistance and the "escape clause" provision are payoffs that make trade liberalization politically feasible. In contrast, a worker laid-off due to tight monetary policy is not entitled to special compensation beyond the usual unemployment insurance. It is difficult for

economists to see the difference between workers in these two cases, but it is built into our institutions: the Federal Reserve Bank has the right to tighten monetary policy, regardless of the consequences, whereas foreign countries *do not* have the right to sell products abroad with first negotiating this access, as done under the GATT and WTO. The sovereignty of nations, combined with shared authority for trade policy within a nation, implies that economic hardship due to trade liberalization will be treated differently from hardship due to changing domestic conditions.

In view of the increased integration of the global economy, it may be that the "escape clause" provision should be strengthened to obtain better coverage of individuals affected, as has been proposed by Rodrik (1997). But the concern for the change in income of domestic factors is not new, and the magnitude of potential losses for unskilled labor in industrial countries – where these losses are due to increased trade and outsourcing – is perhaps no greater now than has occurred in earlier rounds of trade liberalization under GATT. What does seem new in the current debate is the concern for the workers in *foreign* countries, either in regard to their conditions of work or their right to organize. An example is the Labor Side Agreement negotiated under the North American Free Trade Agreement (NAFTA), and ratified by the United States, Canada, and Mexico. Can provisions such as this be justified in welfare terms?[8]

By considering only the well-being of domestic agents, the "conservative social welfare function" is actually a very narrow concept. Clearly, it makes sense to include the well-being of agents in other countries within any welfare criterion. But the concerns being expressed for foreign workers are slightly unusual in that they do not necessarily focus on the poorest workers abroad. Furthermore, the concerns expressed for foreign workers do not focus on those workers facing a drop in income due

8. The political economy factors leading to support for international labor standards are examined empirically by Krueger (1996).

to trade. For example, a foreign worker facing health hazards in a plant producing export products may be better off than if she did not have that job. Indeed, the "voluntary" nature of the employment relation is sometimes used as a justification for avoiding intervention. But this is surely incorrect! The fact that a worker would "voluntarily" continue in a job that exposed her to health hazards attests to her dismal alternative opportunities, and the complete absence of any bargaining power compared to the firm. This is precisely the situation where some institution (be it the government or a union) that can represent the interests of workers is called for.

The question, then, is whether trade policy has any role to play in protecting the interests of foreign labor. A number examples of this already exist. Even prior to NAFTA, several U.S. trade laws give the Executive Branch the power to withhold trade privileges from countries that do not give their workers basic rights, including the right to organize. These include the 1983 Caribbean Basin Initiative, the 1984 Amendments to the Generalized System of Preferences (GSP), and the Omnibus Trade Act of 1988 (Stone, 1996, p. 469). Such provisions have occasionally been used, as in 1987 when President Reagan denied GSP preferences to Nicaragua, Paraguay and Romania on the basis of their alleged violations of labor rights. While these powers exist for the Executive Branch, there are two problems with their use. First, denying preferences to a foreign country across all industries is a very broad foreign policy action, and would usually be decided on that basis. These laws are too sweeping to allow particular companies to be sanctioned. Second, these laws involve a comparison of U.S. labor standards with those found abroad, and the decision that the foreign practices are inadequate. This is a difficult and value-laden judgement, since it involves imposing the preferences of one country on another. Considerations of national sovereignty suggest that countries are largely

entitled to choose their own domestic policies, even when they conflict with established norms abroad.[9]

There are examples of other trade laws, however, that do not impinge on national sovereignty and are designed to protect workers in foreign countries: the Labor Side Agreement negotiated under NAFTA is a case in point. This agreement does not change the existing labor laws in these countries, but it meant to improve the *enforcement* of laws dealing with occupational health and safety, child labor, and minimum wages. If one country believes that another is failing to enforce its own laws in these areas, then a complaint can be brought before the North American Commission for Labor Cooperation, which includes representatives from each country, and that attempts to resolve the dispute through consultation and cooperation. Critics of this agreement have argued that the procedures for resolving disputes are slow, and include major exceptions that render them ineffective. Stone (1996, p. 463), for instance, argues that the Side Agreement contains "exceptions [that] provide a legal excuse for almost all nonenforcement. In fact, in light of these broad exceptions, it is difficult to imagine any situation in which the Side Agreement's procedures for obtaining labour law enforcement would apply." Others argue that the agreement has created an institutional forum in which unions and labor activists from the three countries can build solidarity, and that even the review of cases leads firms to modify their practices (Compa, 1997a).[10]

What accounts for the relatively weak provisions of the Labor Side Agreement, at least as

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9. An important example here is child labor, which is avoided in industrial countries, but may be necessary for families in developing countries. T.N. Srinivasan (1995) has argued that imposing the norms of industrial countries, especially via trade sanctions, would be a mistake.

10. From 1994-1997, there were six cases treated under the Labor Side Agreement, five in Mexico and one in the U.S., all involving union rights. Union activities are covered by the first (or lowest) of three tiers of treatment under the Agreement, which means that the cases are restricted to a fact-finding review process, with optional ministerial consultations (Compa, 1997a). There is now a case being considered at the second tier of treatment, involving alleged pregnancy discrimination among actual or prospective female workers in the *maquiladora* sector

compared to import policies such as the "escape clause"? One part of the answer is that these provisions place domestic labor and business in an adversarial position. *Without* capital mobility, domestic workers and firms would both want greater enforcement of labor standards abroad, so as to lessen import competition. This is similar to the common front that labor and capital often take in Section 201 protection, with unions and firms in an industry both appearing before the U.S. International Trade Commission to argue for tariff protection. But *with* rapid capital mobility (through either direct investment or outsourcing), firms can move abroad to take advantage of lower wages and regulatory burdens, so they would not want to have regulations enforced more strictly. This means that globalization and rapid capital mobility has changed the bargaining positions of labor and capital. The position of capital has been strengthened in that it can seek opportunities abroad, while labor has been placed in a weakened position. Some preliminary evidence on this is provided by Slaughter (1997), who finds that globalization has increased the elasticity of labor demand in some manufacturing industries.

The impact of globalization on changing the bargaining position of labor and capital has far-reaching consequences. The decline in union power within trade-impacted industries may well account for a portion of the increased wage inequality in the United States (Borjas and Ramey, 1995).[11] The after-tax earnings of workers are also affected by government policy, and Rodrik (1997) shows that taxation within the OECD countries has been shifting away from capital and towards labor. Such an outcome is efficient, since the deadweight losses from taxing mobile capital are high, but it has distributional effects that cannot be ignored. While the ability to raise revenue from capital taxation has

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of Mexico (Compa, 1997b).

11. Some contrary evidence is provided by Blanchflower (1997), however, who finds that the wage gap created by union pressure has remained roughly constant in both the U.S. and Great Britain, even while there has been a decline in union membership in both countries.

been reduced, the need to raise revenue to offset external risks created by international competition has increased. This is the fundamental policy dilemma that Rodrik identifies.

Efficiency and Equity

The world has become increasingly integrated through trade in the last several decades, and the structure of trade has shifted towards more outsourcing, or vertical specialization. I have suggested that to understand the implications of this change, we need to use a conceptual framework where firms allocate their production activities worldwide. While many details of this framework remain to be worked out, in this section, I would like to speculate on the type of results that it might yield.

First, the globalization of production should bring with it gains from trade that are likely to be substantial. Over and above the traditional gains from increased specialization and exchange across countries, trade in intermediate inputs brings efficiency gains that amount to an outward shift in the production frontier for final goods in each country. This was emphasized by Ethier (1982), who discussed international returns to scale due to increased variety and trade in differentiated intermediate inputs.[12] While Ethier's model is static, it is often credited with containing the key insights of the "endogenous growth" literature, under which productivity grows due to increased variety (or quality) of inputs. The same productivity gains discussed in this literature apply when firms shift their production activities across countries.

However, we must ask whether these efficiency gains bring costs in terms of the distribution of income. One way to phrase this questions is to consider whether outsourcing makes factor-price equalization more or less likely. Evidence from the integration of countries through trade strongly

12. Sanyal and Jones (1982) developed a model of trade in intermediate inputs at about the same time, but did not focus on the issue of returns to scale.

supports the idea that factor prices move towards equality (Ben-David, 1993, 1996; and see Williamson's contribution in this issue). If we *also* allow firms to spread their production process across countries, would this accelerate or offset the movement towards factor-price equalization?

To answer this, start with two countries having quite different factor endowments. Suppose that they are different enough so that trade in final goods is not able to equalize factor prices. Now allow firms in each country to break up their production process, and pursue activities in the other country. Activities that are intensive in unskilled-labor would be performed in the country abundant in that factor. Effectively, this is the same as allowing firms to import a certain amount of primary factors from the other country, and combine it with their home production. The result of this outsourcing activity on factor prices would therefore be the same as the movement of factor between countries: *it would move factor price towards greater equality*. From the perspective of the scarce factor in each country (unskilled labor in the U.S.), this means that their wages would be lowered by outsourcing, over and above the impact of trade in final goods. In this sense, the decision of companies to spread production across countries has distributional consequences that cannot be ignored. The position of low-skilled workers in the industrial countries is worsened by the complementary combination of globalization and new technology.

This raises the question of whether it is possible to redistribute income towards low-skilled workers, and by what policy instrument. We know surprisingly little about redistribution schemes, other than that they often fail. The common problem is that obtaining the necessary information on who to compensate, and by how much, creates severe disincentives. But one suggestion has been made in several quite different contexts, albeit in somewhat different forms, and is worth repeating here. Dixit and Norman (1986) have shown that a system of tax and subsidies on all goods and factors,

combined with a poll subsidy, can be used to obtain Pareto gains from trade, without requiring a mechanism for revelation of private information. Exactly this type of proposal was made in the context of German unification by Akerlof et al. (1991), who argued that a wage subsidy to workers in East Germany would prevent them from experiencing losses, and would be pay for itself through savings in unemployment insurance. More recently, Phelps (1996) has argued eloquently that a wage subsidy directed at the lowest paid workers ought to be considered in the United States. The scheme he proposes has a budgetary cost of about $125 billion in 1997, but he suggests that much of this would be recouped through increased tax revenues and reduced social expenditures as employment rose. It is striking that such similar proposals have been made in these different contexts. If we want to move beyond the possibility of Pareto gains to making actual compensation, it appears that we could do no better than wage subsidies to low-skilled workers.

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Table 1: Ratios of Merchandise Trade to GDP (Percent)

Country	1890	1913	1960	1970	1980	1990
Australia	15.7	21.0	13.0	11.5	13.6	13.4
Canada	12.8	17.0	14.5	18.0	24.1	22.0
Denmark	24.0	30.7	26.9	23.3	26.8	24.3
France	14.2	15.5	9.9	11.9	16.7	17.1
Germany	15.9	19.9	14.5	16.5	21.6	24.0
Italy	9.7	14.4	10.0	12.8	19.3	15.9
Japan[a]	5.1	12.5	8.8	8.3	11.8	8.4
Norway	21.8	25.5	24.9	27.6	30.8	28.8
Sweden	23.6	21.2	18.8	19.7	25.0	23.5
United Kingdom	27.3	29.8	15.3	16.5	20.3	20.6
United States[b]	5.6	6.1	3.4	4.1	8.8	8.0

Notes:

Merchandise trade is measured as the average of imports and exports, expect as noted below.

a. Data for 1890-1950 uses three-year averages.

b. Data recorded under 1890 is for 1889, and along with that in 1913, measures the ratio of merchandise exports to GNP.

Sources:

1960-1990: Data for the United States are taken from *Economic Report of the President, 1997,* Tables B-10 and B-101; data for other countries are calculated from *World Tables of Economic and Social Indicators, 1950-1992,* The World Bank, 1993.

1890-1913: Data for the United States from Irwin (1996, Table 1); data for Japan from Bairoch and Kozul-Wright (1996); data for other countries from Williamson (1996, Table 1).

Table 2: Ratios of Merchandise Trade to Industry Value-Added (Percent)

Country	1890	1913	1960[a]	1970	1980	1990[b]
Australia	27.2	35.6	24.4	25.6	32.4	38.7
Canada	29.7	39.4	37.6	50.5	65.6	69.8
Denmark	47.4	66.2	60.2	65.9	90.0	85.9
France	18.5	23.3	16.8	25.7	44.0	53.5
Germany	22.7	29.2	24.6	31.3	48.5	57.8
Italy	14.4	21.9	19.2	26.0	43.1	43.9
Japan	10.2	23.9	15.3	15.7	25.8	18.9
Norway	46.2	55.2	60.0	73.2	70.9	74.8
Sweden	42.5	37.5	39.7	48.8	72.9	73.1
United Kingdom	61.5	76.3	33.8	40.7	52.6	62.8
United States[c]	14.3	13.2	9.6	13.7	30.9	35.8

Notes:

Merchandise trade is measured as the average of imports and exports, expect as noted below. Industry value-added combines agriculture, mining and manufacturing for the U.S., and these sectors plus construction and public utilities for most other countries.

a. Value for Australia refers to 1962, and for Canada refers to 1961.
b. Value for Canada refers to 1988, for Germany to 1989, and for the U.K. to 1987.
c. Data recorded under 1890 is for 1889, and along with that in 1913, measures the ratio of merchandise exports to industry value-added.

Sources:

1960-1990: Data for the United States are taken from *Economic Report of the President, 1997,* Tables B-10 and B-101; data for other countries are calculated from *World Tables of Economic and Social Indicators, 1950-1992,* The World Bank, 1993, except as noted below.
1890-1913: Data for the United States from Irwin (1996, Table 1). Data for other countries are computed from Table 1, making use of the proportion of national income accounted for by agriculture, mining, manufacturing, construction and public utilities from Mitchell (1992, 1993, 1995). These values are also used in computing the trade ratios for Denmark and Italy in 1960, and for France and Sweden in 1960 and 1970. For Canada, the industry share of GDP in 1890 and 1913 is assumed to equal that in 1926-29, the earliest years for which data is available.

Table 3: Shares of U.S. Exports and Imports by End-Use Categories (Percent)

Category		1925	1950	1965	1980	1995
Foods, feeds and	Imports	21.9	30.0	19.1	11.3	5.0
beverages	Exports	18.7	15.5	19.2	16.9	9.2
Industrial supplies	Imports	68.2	62.4	53.3	31.3	18.2
and materials	Exports	59.8	45.5	34.8	32.2	25.6
Capital goods	Imports	0.4	1.3	7.1	19.0	33.6
(except autos)	Exports	8.7	22.4	31.4	35.0	42.4
Consumer goods	Imports	9.4	6.1	16.0	21.5	24.3
(except autos)	Exports	6.0	8.9	7.0	7.8	11.7
Automotive vehicles	Imports	0.02	0.3	4.5	16.9	18.9
and parts	Exports	6.8	7.8	7.5	8.1	11.2

Sources:

1990 and 1980 from the December issue of the *Survey of Current Business* for 1992 and 1982, Table 4.3; 1970 from *The National Income and Product Accounts of the United States, 1929-1976, Statistical Tables*, Department of Commerce, September 1981, Table 4.3; 1925-1960 from *U.S. Exports and Import Classified by OBE End-Use Commodity Categories, 1923-1968,* Supplement to the Survey of Current Business, Department of Commerce, November 1970, Tables 1 and 2.

Table 4: Ratio of Imported to Domestic Intermediate Inputs - Textiles, Apparel and Footwear (Percent)

Country	Early 1970s	Mid/late 1970s	Mid-1980s
Canada	41	50	60
France	15	26	42
Germany	na	49	64
Japan	3	6	9
United Kingdom	19	33	48
United States	7	6	13

Source: Audet (1996, Table 8.18).

Table 5: Share of Imported to Total Intermediate Inputs (Percent)

Country	1974	1984	1993
All Manufacturing Industries			
Canada	15.9	14.4	20.2
Japan	8.2	7.3	4.1
United Kingdom	13.4	19.0	21.6
United States	4.1	6.2	8.2
Chemical and Allied Products			
Canada	9.0	8.8	15.1
Japan	5.2	4.8	2.6
United Kingdom	13.1	20.6	22.5
United States	3.0	4.5	6.3
Industrial Machinery (Non-electrical)			
Canada	17.7	21.9	26.6
Japan	2.1	1.9	1.8
United Kingdom	16.1	24.9	31.3
United States	4.1	7.2	11.0
Electrical Equipment and Machinery			
Canada	13.2	17.1	30.9
Japan	3.1	3.4	2.9
United Kingdom	14.9	23.6	34.6
United States	4.5	6.7	11.6
Transportation Equipment			
Canada	29.1	37.0	49.7
Japan	1.8	2.4	2.8
United Kingdom	14.3	25.0	32.2
United States	6.4	10.7	15.7

Notes: U.S. estimates are for 1975, 1985, and 1995.

Source: Campa and Goldberg (1997, Tables 1,3,5,7).