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WP/97/43

INTERNATIONAL MONETARY FUND

Research Department

**The Effect of Globalization on Wages in the Advanced Economies**

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April 1997

**Abstract**

This paper examines the effect of globalization on labor markets in the advanced economies, focusing particularly on the claim that increased economic integration has widened the gap between the wages of more skilled and less skilled workers. The broad consensus of research is that globalization, both in terms of increased trade as well as increased capital mobility and foreign direct investment, has had only a modest effect on wages. Instead, changes in technology have led to a pervasive shift in demand for labor that has favored skilled workers to the detriment of less skilled workers.

**JEL Classification Numbers:** F10, J31

**Keywords:** Globalization, trade and wages, capital mobility

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### SUMMARY

Increased globalization--the international integration of markets for goods, factors, and technology--has coincided in the past two decades with a shift in labor demand away from less-skilled workers toward those with more skills. This shift in labor demand has widened the gap in wages between the two groups of workers and has raised income inequality and unemployment, primarily among low-skilled workers. This paper summarizes research on the connection between globalization and labor markets in the advanced economies.

Much of the concern about the effects of globalization has focused on the impact of imports from developing countries on wages, employment, and income inequality. However, the consensus of empirical research suggests that increased trade accounts for only about 10 to 20 percent of the changes in wages and income distribution in the advanced economies. The more important influence on labor markets in the 1980s and 1990s has been a technology-driven shift in labor demand away from less-skilled workers and toward more-skilled workers. This shift has resulted in increased wage inequality in some countries, and in lower relative employment among unskilled workers in others.

Increased capital mobility, including the "outsourcing" of production to low-wage countries, as well as immigration from developing countries to the advanced economies, appears to have had only modest effects on labor markets in the advanced economies. Nonetheless, further globalization can increase the sensitivity of wages and employment to external shocks and thereby contribute to greater job insecurity. Policymakers must keep in mind potential social dislocations from these changes and ensure that those who are displaced do not become marginalized. It is important, however, that any policy actions do not impede adjustment, but rather provide incentives for workers and firms to adjust to and therefore gain from changes in the global economic environment.

## I. INTRODUCTION

This paper examines the extent to which “globalization”--the increasing international integration of markets for goods, factors, and technology--affects labor markets in the advanced economies, focusing particularly on the effect of globalization on wages.<sup>2</sup> Globalization has been occurring through both expanded trade in goods and increased movement of factors across countries, as exemplified by the phenomena of capital and technology flows, foreign direct investment, and migration. At the same time as globalization has increased, labor demand in many advanced economies has shifted away from less-skilled workers toward those with more skills. In many advanced economies, this trend has produced a widening of the gap in wages between the two groups of workers, along with rises in both income inequality and unemployment, primarily among the less skilled. This rise in inequality potentially has adverse social and economic consequences. The paper examines the claim that globalization has been an important cause of these changes.

It first summarizes the important facts about globalization and advanced economy labor markets in recent decades. The discussion then focuses on one aspect of globalization: the claim that import competition from increased international trade with developing countries has directly hurt less-skilled workers in the advanced economies by lowering their wages. This aspect of globalization has received the greatest share of attention in the United States, but increasing attention in other countries as well. The paper reviews economic theory that links trade flows to labor markets and then discusses empirical findings. The broad consensus of this research for the United States is that import competition accounts for only a modest part of increased income inequality. Estimates of the share of the increase in inequality accounted for by trade range from zero to one-third, with nearly all indications falling in the lower part of the range. What is particularly noteworthy is that several very different methodologies have been used to estimate the contribution of trade to U.S. income inequality, but almost all approaches find that the contribution is fairly small. Although there has been less research on other advanced economies, the evidence to date suggests a similarly small effect of imports on wages but possibly a larger effect on employment in Europe, which is likely in part a reflection of structural rigidities in European labor markets.

Two other ways in which international trade affects wages are then explored: (1) by altering wage differentials across industries within a country and thus equalizing wages across countries, and (2) by increasing labor-demand elasticities and thus making labor markets more

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<sup>2</sup>In this paper, reflecting the focus of the empirical analysis, “advanced economies” in most contexts refer to the “industrial countries” as traditionally classified in the World Economic Outlook, while “developing countries” include the newly industrialized economies.

sensitive to external shocks. Again, however, research to date suggests that these indirect effects of trade on wages have been fairly modest.

The paper further examines aspects of globalization other than trade that affect labor markets. First, international capital mobility may contribute to wage and income inequality in the advanced economies if low-skill-intensive activities tend to migrate to developing countries, for example through the operations of multinational firms. Increased capital mobility might also tend to equalize rates of return to capital across countries so that the costs of adjustment to external shocks fall more heavily on labor. This is particularly relevant for countries in which labor markets are characterized by substantial structural rigidities, as in much of Europe. Second, international labor mobility could contribute to increased inequality in advanced economies if less-skilled workers there face relatively strong competition from immigrants seeking higher wages. Third, transfer of technology across countries potentially affects labor markets. These issues have been studied somewhat, but not as much as the effect of international trade on wages and income inequality.

Finally, some public policy implications of globalization for labor markets are discussed. Although globalization on balance tends to raise aggregate welfare for every country, the gains are likely to be distributed unevenly across countries and between different sectors and groups within countries. Policymakers are likely to need to take account of distributional issues as well as the transitional costs in designing policies aimed at easing adjustments to changed economic circumstances. However, such policies must be implemented in such a way as to promote adjustment rather than hamper it.

## **II. BASIC FACTS ABOUT GLOBALIZATION AND LABOR MARKETS**

How closely connected are economies around the world? Has increased integration of economies coincided with adverse developments in labor markets? These issues are examined in turn.

### **A. Globalization of Product Markets**

The share of trade (either imports or exports or both together) in output provides a ready measure of the extent of product market globalization. It is important to emphasize that however measured, product market integration has *not* expanded continuously over time. World trade grew in relation to output from the mid-1800s to 1913, but then fell from 1913 to 1950, as international trade in goods and services was curtailed by the effects of the two world wars and protectionist policies implemented during the Great Depression (Table 1). Krugman (1995a) and Irwin (1996) point out that only since the 1970s have trade flows reached the same proportion of output as at the turn of the century, with the increase in trade spurred both by an easing of artificial barriers to trade such as tariffs and quotas, and by technological advances which have overcome natural barriers to trade, particularly increased efficiency of communication and falling transportation costs.

**Table 1. Globalization Measured by Exports as a Share of Output**  
(In percent)

Year <sup>1</sup>	World Exports of Goods and Services/GDP	World Exports of Merchandise/GDP	United States Exports of Merchandise/GDP	United States Exports of Merchandise/Tradeables Production
1820	...	1.0	...	...
1850	5.1	...	...	...
1870	...	5.0	...	...
1880	9.8	...	5.6	14.3
1913	11.9	8.7	6.1	13.2
1929	...	9.0	5.2	13.9
1950	7.1	7.0	3.6	8.9
1970	11.7	11.2	4.2	14.1
1985	14.5	...	8.3	29.2
1990	17.1	13.5	7.0	31.4

Sources: Krugman (1995a), p. 331; Maddison (1995), p. 38, and Irwin (1996), p. 42.

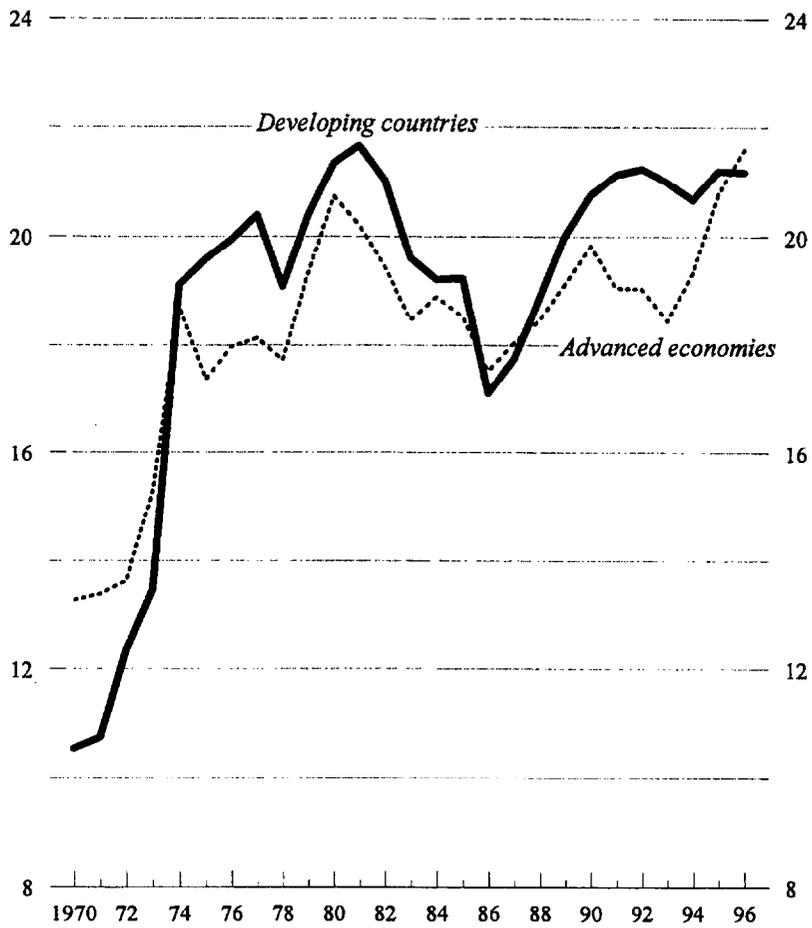
<sup>1</sup>Years vary slightly by source.

Two additional points about trade volumes are important to keep in mind. First, the rise in the ratio of exports to total output likely understates the degree of product market globalization. As documented by Rowthorn and Ramaswamy (1997), an increasing share of output in the advanced economies consists of largely nontradable services: education, government, finance, insurance, real estate, and wholesale and retail trade. Given this, Irwin notes that “perhaps a better indication of the importance of international trade is to consider merchandise exports as a share of the production of [just] tradable goods” (p.42). This alternative measure shows a much larger role of trade (Table 1).

Second, for many countries, the most important decade since World War II for globalization was the 1970's, during which the ratio of trade to output rose markedly across both advanced economies and developing countries, mainly in the wake of the two oil shocks (Chart 1). In assessing whether trade contributes to income inequality, it is important to keep in mind that the largest expansion of advanced economies' trade in relation to output occurred before the increase in inequality. In developing countries, exposure to international trade picked up once again in the late 1980's, coinciding with their movement toward trade

**Chart 1. Trade in Goods and Services as a Share of Output**  
*(In percent of GDP)*

The importance of trade grew markedly in the 1970's.



liberalization. For the advanced economies, by contrast, data suggest that product markets have become steadily more open to global competition since about 1950.

An alternative measure of product market globalization would be data on prices of tradable goods rather than quantities. Indeed, as will be discussed in Section III, international trade theory suggests that trade affects labor markets through the prices at which trade occurs, not through the quantity of goods involved. Trade volumes do not necessarily carry information on the extent to which trade affects labor markets, since even a small import share can have a large effect on wages if it leads to wholesale changes in the competitive structure of a domestic industry. Given this, product market integration is perhaps better measured with information on the extent to which prices for traded products are similar across countries. Complete globalization in the sense of openness to trade would then imply that the law of one price prevails worldwide.

Unfortunately, data on international product prices are more difficult to obtain than data on international trade flows. Williamson (1995) shows that in the decades preceding 1913, several product markets experienced significant and prolonged movements toward price convergence across countries. Some evidence on the strength of price convergence more recently can be gleaned from analysis of whether purchasing power parity (PPP) holds in its absolute or relative forms, albeit with the caveat that this research examines average prices of goods rather than prices of individual commodities and may say as much about the working of the foreign exchange market (and the importance of financial transactions vis-a-vis trade) as about the integration of goods markets. Froot and Rogoff (1996) conclude that deviations from PPP in the post-war advanced economies persist for several years, implying that there remain substantial barriers to product and financial market integration.

## **B. Recent Labor Markets Developments**

An important trend in labor markets in the advanced economies has been a steady shift in relative labor demand away from the less skilled toward the more skilled. This is the case however skill levels are defined, whether in terms of education, experience, or job classification. This has produced dramatic rises in wage and income inequality between the two groups in some countries and in unemployment among the less skilled in others.

Until fairly recently, this phenomenon received most attention in the United States. Since the late 1970's, wages of less-skilled Americans have fallen dramatically relative to the more skilled. The precise timing and magnitude of the changes differ somewhat with the measure of skill, but all show dramatic changes: Bound and Johnson (1992) find that between 1979 and 1988, the ratio of the average wage of a college graduate to the average wage of a high school graduate rose by 20 percent; Davis (1992) finds that between 1979 and 1987, the ratio of average weekly earnings of males in their forties to average weekly earnings of males in their twenties rose by 25 percent; and Lawrence and Slaughter (1993) find that between 1979 and 1989 in manufacturing, the ratio of average annual earnings of nonproduction workers to average annual earnings of production workers rose by 10 percent.

Abstracting from all measures of skill and defining the skilled and unskilled simply as those at the top and bottom of the earnings distribution, Katz and Murphy (1992) find that remuneration of workers (male or female) at the 90th percentile in the distribution relative to that of workers at the 10th percentile has increased steadily since the late 1960's, with a sharp acceleration in this trend since about 1980.<sup>3</sup> This growing inequality reverses a trend of previous decades (by some estimates, going as far back as the 1910's) towards greater income equality between the more skilled and the less skilled.

In principle, this dramatic development could have been caused by either an increase in the supply of or a decrease in the demand for less-skilled workers relative to the more skilled. However, Katz and Murphy show that for the United States economy as a whole, supply changes cannot explain growing income inequality, simply because the relative supply of more-skilled workers has increased. If labor markets work freely, relative earnings can increase in the face of increased relative supply only if relative demand increases by more. Katz and Murphy conclude that "demand growth was an important component of the change in factor prices over the period as a whole [1963-1987] and particularly during the 1980s" (p. 52).

Berman, Bound, and Griliches (1994) find that for the manufacturing sector, labor demand shifted only in part because of a shift *across* industries in output toward skill-intensive industries. They find that approximately 70 percent of the overall shift in labor demand was a change in skill demands *within* industries. Lawrence and Slaughter demonstrate that at all levels of industrial classification, the majority of U.S. manufacturing industries during the 1980's employed relatively more high-skilled workers than in the 1970s, even though the relative wages of these workers had risen. This can be explained only by a shift in demand toward more-skilled workers.

To summarize: U.S. labor demand since the late 1970s has shifted sharply away from less-skilled workers and towards more-skilled workers. The result has been a substantial increase in income inequality between these two groups.<sup>4</sup> It is also important to note that, as

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<sup>3</sup>These numbers, like almost all in the literature, measure just wages and do not include non-wage compensation or fringe benefits such as health care and pension plans. However, Freeman (1996) presents evidence that over time skilled workers have also received a larger share of fringe benefits. The numbers presented above thus may *understate* the widening of income inequality.

<sup>4</sup>Another type of income inequality has emerged recently: an increase in inequality between workers within particular skill or experience groups. Juhn, Murphy, and Pierce (1993) show that even within narrowly defined segments of the labor market (e.g., male college graduates with one to ten years of work experience) the variation in earnings has risen dramatically. Ramaswamy and Rowthorn (1991) develop a model which generates this sort of increased

(continued...)

deflated by the consumer price index, the average real wage in the United States has grown only slowly since the early 1970s and the real wage for unskilled workers has actually fallen.<sup>5</sup> Freeman estimates that male high-school dropouts have suffered a 20 percent decline in real earnings since the early 1970s.

Similar developments have occurred in labor markets in other countries. In twelve advanced economies including Germany and the United Kingdom, Berman, Machin, and Bound (1996) find that "pervasive" skill-biased technological change has led to a shift in labor demand toward skilled workers. Goux and Maurin (1997) find that in France, for which Berman, Machin, and Bound do not have data, the decline in demand for unskilled labor resulted primarily from changes in domestic demand that favored skill-intensive products, rather than from technology.

Except in the United Kingdom, however, the changes in wage differentials have generally been much less marked than in the United States. Freeman and Katz (1996) report that since the 1970s, Australia, Canada, Japan, Spain and Sweden have experienced a modest rise in wage differentials, France, Germany, and Italy no rise, and the Netherlands a small fall. In Japan and the United Kingdom, although the wage differential widened to varying degrees, real wages rose for all workers, in contrast to the U.S. case, where wages fell for those at the bottom.

Although wages did not change as much as in the United States, Freeman and Katz note that countries with smaller increases in wage inequality suffered instead from higher rates of unemployment for less-skilled workers. According to Freeman and Katz, "... most other industrial nations with less increase in wage inequality... than the United States suffered from much slower employment growth and sharper increases in unemployment/nonemployment among less educated and younger workers" (p. 4).<sup>6</sup>

What explains the differences in outcomes for wages and employment across countries is differences in labor market structures. In countries with relatively flexible wages set in decentralized labor markets such as the United States, and increasingly, the United Kingdom,

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<sup>4</sup>(...continued)  
wage dispersion.

<sup>5</sup>However, the consumer price index possibly overstates inflation and thus exaggerates the decline in real wages.

<sup>6</sup>This analysis is challenged by Bertola and Ichino (1995) and Nickell and Bell (1996), who cite evidence that unemployment rates rose in many European countries for both skilled and unskilled workers. As discussed by Murphy (1995), however, this possibly reflects changes within skill categories, with the increase in skilled unemployment caused by rising unemployment for workers at the bottom of the "skilled" category.

the decline in relative demand for less-skilled labor translated into lower relative (though in the UK, not absolute) wages for these workers. In contrast, in countries with relatively rigid wages set in centralized labor markets such as France, Germany, and Italy, it meant lower relative employment. Freeman and Katz further note: "By allowing the full brunt of shifts in supply and demand to fall on wages in the 1980s, when those shifts operated against the low skilled and lower paid, the United States could be expected to have especially large drops in the relative earnings of less educated workers, as it did. In western European countries, by contrast, explicit government and union policies dampened pressures of increased wage differentials in the 1980s" (p. 18). However, the floor on wages for unskilled workers led instead to unemployment. Across advanced economies, then, the basic trend seems to have been a sharp decline in the demand for less-skilled workers relative to those with more skills, leading to some combination of lower relative earnings and higher relative unemployment for the less skilled.

Robbins (1996) presents evidence that income inequality has risen in a number of developing countries as well. For several countries, including Chile, Columbia, Costa Rica, Mexico, and Uruguay, he finds that the rise in wage dispersion coincided with periods of trade liberalization; however, Robbins does not find evidence of a causal link between inequality and trade. In fact, in some developing countries, he finds that the relative supply of skilled labor increased at the same time as trade liberalization in these countries' export markets expanded the demand for unskilled labor. These changes would have been expected to lower skilled wages and raise unskilled wages, and thus to narrow income inequality in developing countries. That the opposite transpired suggests that labor demand in developing countries has also shifted toward workers with high skill levels relative to the average in developing countries. Feliciano (1995) similarly finds that trade liberalization in Mexico in the mid-to-late 1980s led to increased relative wages of high-skilled workers.

### **III. DOES IMPORT COMPETITION AFFECT WAGES?**

Not surprisingly, it is often asserted that there is a link between increased globalization and the declining relative wages of less-skilled workers in the advanced economies. This section focuses on the most visible aspect of this supposed link: whether increased international trade, particularly with developing countries, contributes to rising income inequality. Reflecting the bulk of research on the topic, the focus is again on developments in the United States. A remarkable development in the analytical literature on trade and wages is a divergence in the methodologies used to study the issue: trade economists have focused on the role of imports in lowering product prices and thus wages, while labor economists have used the quantity rather than the price of imports as a measure of the intensity of import competition. The paper first discusses research by trade economists, then research by labor economists and contrasts the two approaches.

### A. The Effect of Import Prices on Wages

Economic theory provides a compelling hypothesis for how trade might cause increased income inequality: the Stolper-Samuelson theorem. In the simple trade model with two tradable goods and two non-tradable factors of production, the strong form of the theorem states that a decrease in the relative price of one of the goods leads to a decrease in the real return to the factor used relatively intensively in making that product, along with an increase in the real return to the other factor.<sup>7</sup> For example, trade pressure that results in lower prices of import-competing goods would lead to lower wages for workers whose skills are used intensively in the production of the affected goods.

As with many strong results obtained from simple models, this one weakens considerably when generalized to a more realistic framework. The analogue of the Stolper-Samuelson theorem for a world with many goods and factors is that an increase in the relative prices of a bundle of traded products tends to increase the relative return to the factors used relatively intensively in making those products and tends to lower the relative return to the other factors, but the precise effects on any particular factor is not easily derived. In these more general models, stronger statements cannot be made without restrictive assumptions about production technology. Lawrence and Slaughter provide a detailed discussion.

Nonetheless, the basic intuition of the Stolper-Samuelson theorem is straightforward. International trade affects product prices across countries, and this affects factor prices within countries by influencing relative factor demands. At the initial factor prices, changes in product prices brought about by competition from imports alter the profit opportunities facing firms in a country. Firms respond by shifting resources toward industries in which profitability has risen and away from those in which it has fallen. Trade flows thus give rise to shifts in factor demands, as demand rises for the factors used relatively intensively in newly profitable sectors and falls in unprofitable sectors. With fixed supplies of factors, these demand changes lead to changes in factor prices.

The Stolper-Samuelson theorem thus suggests a mechanism by which import competition can lead to a shift in demand toward skilled labor and thus to an increase in skilled wages relative to unskilled wages: import competition lowers the price of unskilled-labor-intensive products relative to the price of skilled-labor-intensive ones, so that domestic firms shift toward producing skill-intensive goods. The issue then becomes empirical: have relative product prices in the advanced economies, in fact, changed in this way? If so, trade might have contributed to rising income inequality, but it must first be shown that changes in product prices are the result of trade rather than other, purely domestic, influences.

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<sup>7</sup>The Stolper-Samuelson theorem applies in some version in both the basic Heckscher-Ohlin-Samuelson trade model and in the extension to models of imperfect competition. Helpman and Krugman (1985) derive the Stolper-Samuelson theorem in the context of a general model which allows for both perfect and imperfect competition.

Lawrence and Slaughter analyze U.S. manufacturing prices from 1979 to 1989. They find no evidence of larger price increases in skilled-labor-intensive products; if anything, price increases were larger in the unskilled-labor-intensive industries. Since prices of import-competing goods did not change in a way consistent with pressure from import competition, they conclude that trade did not contribute through the Stolper-Samuelson process to rising wage dispersion and income inequality in the 1980s. For 13 industrial countries during the 1970s and 1980s, Saeger (1996) finds considerable variation across countries in product price changes. For Europe, he finds that rapid technology change led to relative price declines in skill-intensive industries rather than the price decreases in unskilled-labor-intensive industries one would expect in the face of import competition from developing countries.

Subsequent papers have refined this analysis by handling differently some of the methodological issues raised by Lawrence and Slaughter. Three important issues are: (1) which prices to use, (2) how to measure skills, and (3) how to control for other influences on product prices such as technological change. Lawrence and Slaughter assume that changes in technology do not affect product prices and take the breakdown between production and nonproduction workers as representing the breakdown between skilled and unskilled workers. They use several measures of prices: producer prices obtained from surveying all domestic firms, export prices obtained from surveying only firms which export, and import prices obtained from surveying just importers.

Sachs and Shatz (1994) argue that computer prices should be dropped from the sample because of the difficulty in measuring quality change in these goods. Having done this, for some prices and time periods they find that the relative prices of skilled-labor-intensive products have increased, but for other specifications their findings are similar to Lawrence and Slaughter's results. Leamer (1996a) allows technological change to affect product prices, since it could be that technological advances have substantially lowered the relative price of skilled-labor-intensive goods, offsetting what would otherwise have been relative price increases caused by low-priced imports of unskilled-labor-intensive goods. He examines the 1960s and 1970s in addition to the 1980s, and uses prices of all domestically produced goods. He confirms Lawrence and Slaughter's results in all specifications for the 1960s and 1980s. For the 1970s, however, Leamer consistently finds relative price increases for skilled-labor-intensive products. He thus concludes that "the 1970s were the Stolper-Samuelson decade."

Krugman (1995a) uses a computable general equilibrium model of the U.S. economy to calculate the changes in relative product prices and relative wages that are consistent with the observed increase in imports from developing countries. He finds that the small volume of U.S. imports from developing countries (around thirty percent of total U.S. imports in 1995, or only about four percent of U.S. output) has led to only small changes in prices and wages--magnitudes Krugman terms "well within measurement error" (p. 359). He concludes that trade has contributed only a small amount, if anything, to rising income inequality.

Finally, Revenga (1992) measures the impact of changes in import prices on wages and employment in individual U.S. industries. She finds that import prices have only small

effects on wages and somewhat larger but still not enormous effects on employment. Neven and Wyplosz (1996) perform a similar analysis for manufacturing industries in Germany, France, Italy, and the United Kingdom. They find no clear pattern for the effect of import competition on wages and employment. In Germany, wages and employment appear to be adversely affected by imports from developing countries; in Italy and the United Kingdom, however, imports from other advanced economies are more important influences on labor markets. Along the lines of Lawrence and Slaughter's results for the United States, they find no clear evidence that prices generally fell in unskilled-labor-intensive industries relative to prices in skill-intensive industries, suggesting again that trade with developing nations is unlikely to have played an important role in affecting wages.

Several papers have thus analyzed whether trade via the Stolper-Samuelson process contributed to rising U.S. income inequality during the 1980s. Each concludes that trade through this channel likely accounts for only a small part of the increase in wage dispersion and the shift towards high-skilled workers.

### **B. The Effect of Import Volumes on Wages**

Labor economists looking at the effect of trade on wages have applied a methodology very different from that of Stolper-Samuelson, focusing instead on the volume of trade and on the factors embodied in these flows rather than the prices of the imports. Borjas, Freeman, and Katz (1992) are perhaps the best example of this approach. They view trade as effectively shipping between countries the services of the factors of production embodied in the traded goods. All else equal, imports add to a country's effective endowment of factors while exports reduce these endowments. The effect of trade on labor markets can thus be thought of as working through factor supplies, rather than factor demands, because the effective endowment of a factor consists of the quantity located within a country's borders *plus* the net quantity imported or exported through trade. The idea is that had the net import bundle instead been produced in the consuming country, the quantity of factors embodied in those imports would have been demanded in that country.

Borjas, Freeman, and Katz use input-output tables and data on U.S. trade flows to infer the quantities of factor services embodied in trade flows. The United States tends to export skilled-labor-intensive products and import unskilled-labor-intensive products, so that the growing importance of trade in the U.S. economy has increased the effective supply of unskilled labor relative to skilled labor. Using wage elasticities from other studies, the authors calculate the effect of these supply changes on wages. They conclude that from 1980 to 1985, trade accounted for around 15 percent of the total rise in income inequality, but that this effect diminished in later years.

Wood (1994) takes a similar approach, but with a focus broader than solely the United States during the 1980s. He attempts to calculate how much of the decline in demand for labor in manufacturing industries across advanced economies during the past several decades can be attributed to import competition from developing countries. Using a factor content

methodology somewhat similar to that of Borjas, Freeman, and Katz, he estimates that trade led to about a 20 percent decline in the demand for labor in advanced economy manufacturing industries, with the decline concentrated among unskilled workers.

However, Wood makes two important assumptions to arrive at this estimate of 20 percent (see Wood 1995, pages 64-68). He first argues that advanced economies do not produce the same goods as those imported from developing countries; for example, imported textiles are made with more unskilled labor than textiles produced in advanced economies and can thus be thought of as a distinct product. This means that input-output tables for the advanced economies understate the amount of less-skilled labor embodied in net trade flows and consequently understate the effect of trade on labor supply and thus on wages. To compensate, he uses input-output tables for developing countries to calculate the factors embodied in imports, an approach which yields effects of trade on the labor supply of unskilled workers ten times larger than that of Borjas, Freeman, and Katz. However, this assumption is rather questionable, since it is likely that differences in factor prices between advanced and developing countries are in fact connected to different factor usages, so that it is not appropriate to assume identical production techniques across countries -- had the imported goods been produced in the advanced economies, they would in fact have been produced using relatively less unskilled labor. The lack of an analytical framework underlying the factor content studies means that the "correct" methodology by which to calculate the quantity of labor displaced by imports is unclear.

Second, Wood asserts that import competition leads firms in the advanced economies to focus on labor-saving innovations, the effect of which according to Wood is to reduce the demand for unskilled labor by more than the direct effect of trade itself. Acknowledging that this effect is difficult to quantify, Wood argues that a plausible magnitude would be to double the effect of trade on wages calculated from his factor content approach. Although it is clearly valuable to explore how technological change might be driven by trade rather than just assuming innovation to be an exogenous process, Wood's assumption that this technology channel implies a doubling of the effect of trade has been sharply questioned, principally because it is based largely on conjecture. Moreover, if trade makes labor-intensive goods relatively cheaper, this would be expected to raise the relative price of capital and thus increase the incentives for the development of *capital* saving technology.

Borjas and Ramey (1995) develop a model in which imports directly displace domestic production, with the lower output in the import-competing sectors putting pressure on wages in those sectors. In particular, trade competition reduces the labor rents generated from extra normal profits in industries in which firms have some market power. Insofar as these rents tend to accrue to less-skilled workers (wages in industries such as automobiles and steel being the archetypical examples), increased import competition widens income inequality. Applying this model to data for the United States, Borjas and Ramey conclude that the increased U.S. trade deficits during the 1980s account for 6 percent to 10 percent of the growth in wage inequality in that decade.

Bound and Johnson, and Berman, Bound, and Griliches examine not only trade but also skill-biased technological change, deunionization, the increase in Federal defense spending, and other factors as possible explanations for the increased demand for skilled labor in the United States. Both conclude that trade contributes little.

Bound and Johnson decompose wage changes for 32 demographic groups of employees in 17 industries into changes in labor supply, product market demand, industry market power, and technology (that is, productive efficiency). Import competition is not measured directly, but is instead subsumed as one of the factors which shift product market demand. They find that the increase in income inequality between college-educated and high school-educated workers is accounted for almost entirely by changes in technology. Shifts in product market demand, including the effect of imports, account for less than 10 percent of the increase in the wage differential.

As discussed in Section II, Berman, Bound, and Griliches focus on the role of trade in shifting the mix of resources used by industries in production. The Stolper-Samuelson process entails expansion of the industries with relative price increases and contraction of others. Based on this, they argue that the effect of trade on labor markets works through cross-industry shifts in labor demand. Again, however, they find that the large majority of the manufacturing-wide demand shift occurred within industries, not across industries. From this they conclude that trade, which would be expected to shift resources across industries, played no significant role in affecting wages. It is worth noting that this methodology ignores the possibility that the Stolper-Samuelson process also entails within-industry shifts in labor demand--assuming flexible production technologies, firms in all industries substitute away from the more expensive factor of skilled labor toward less expensive one unskilled labor.

### **C. The Effect of Trade on Wages: Synthesis and Analysis**

Despite the different methodologies used, nearly all of this research finds only a modest effect of international trade on wages and income inequality. Wood finds quite large effects of trade on employment, but uses a methodology which, while intriguing, has certain arbitrary aspects. The average estimate of the effect of trade on wages and employment is not zero--most research finds some role for trade--but it is certainly lower than what might be expected from purely anecdotal evidence, and certainly far from the claim that import competition makes a "giant sucking sound."

This might seem puzzling in light of the presumption indicating that the advanced economies have become more open to trade since the late 1970s. Given the progression of the Tokyo and Uruguay Rounds of GATT negotiations, the regional free trade areas in Europe and North America, and various unilateral liberalizations, it is surprising that this does not show up in data on product prices. There are at least two possible explanations. One possibility is that on balance the advanced economies have *not* in fact become substantially more open to trade. Although tariffs have fallen, in some cases they have been replaced with non-tariff barriers such as voluntary export restraints in automobiles and steel, the

continuation and expansion of the global Multi-Fibre Arrangement for textiles and apparel, and the web of bilateral non-tariff barriers to protect "sensitive" industries. Another possible explanation is that firms in the advanced economies have upgraded their product mix in the face of low-wage foreign competition. If this is true, foreign competition is potentially blunted and need not lead to large changes in relative product prices.

The results of Leamer (1996a) suggest a role for both possibilities. Leamer finds that during the 1970s, the relative prices of unskilled-labor-intensive industries such as textiles, apparel, and footwear fell dramatically. In the United States, however, this price decline did not continue through the 1980s. One explanation for this is that a tightening of the Multi-Fibre Arrangement stopped the decline in the relative prices of these goods. The other is that U.S. producers responded to foreign competition by abandoning the labor-intensive products most directly exposed to this competition. By the 1980s, the remaining textile, footwear, and apparel activity in the United States faced less intense competition because they produced higher-quality alternatives to rather than direct substitutes for foreign goods. Neven and Wyplosz present similar evidence that firms in Europe have upgraded their product ranges and skill demands in the face of import competition.

Despite the apparently robust finding that there is only a modest connection between trade and increased inequality in wages and income, there is still sharp disagreement about the appropriate methodology. The basic rift between trade economists and labor economists is whether trade prices or trade quantities are the most important channel through which international trade affects wages. Discussions of the methodological divide include Freeman (1995), Lawrence (1996), Richardson (1995), Wood (1995), and Deardorff and Haikura (1994).

The split is over both theory and its empirical implementation. In terms of the theory, there remains disagreement as to whether factor content studies such as Borjas, Freeman, and Katz isolate an independent effect of trade on wages, or whether there are underlying factors such as changes in technology that influence both trade flows and labor markets. That is, does the implicit import of low-skill labor embodied in imports represent an exogenous shift in labor supply in the advanced economies? From the perspective of international trade theory, the answer is no: trade volumes depend on tastes, technology, and resource endowments, and are not necessarily linked to product prices and thus the intensity of import competition. Even a small volume of imports can influence wages if this leads to large changes in domestic prices. However, labor economists and some trade economists counter that under certain conditions, factor content studies do in fact relate the volume of imports to changes in product prices and thus contain information on the effect of trade. Even trade economists differ sharply here; see for example the exchange between Krugman (1995b) and Leamer (1996a, 1996b).

Labor economists further argue that even if product prices are the theoretically correct channel through which trade affects the domestic economy, data on product prices are of such poor quality that they contain little information. Given this, the only alternative is to look at

trade quantities, for which it is claimed that the higher quality of the data compensates for the theoretical problems. Freeman (1995) exemplifies this argument. Indeed, data presented earlier on historical U.S. trade volumes may represent *prima facie* support for Freeman's point. Recall that the big jump in U.S. trade volumes as a share of U.S. output occurred during the 1970s, not the 1980s, and that this matches the largest movements in product prices, which occurred in the 1970s rather than the 1980s.

This issue of how to measure properly the impact of trade on labor markets is still largely unresolved--if anything, the disagreements are becoming more contentious. What is remarkable, however, is the common finding across both literatures of only a small impact of trade on wages and income inequality.

#### **IV. OTHER LINKS FROM GLOBALIZATION TO LABOR MARKETS**

The research discussed in the previous section address only one aspect of the link between globalization and labor markets: whether international trade has directly contributed to lower wages and higher unemployment for unskilled workers, and increased income inequality. This section takes a broader view. It first examines other effects of trade on labor markets, and then summarizes research on the labor market effects of capital mobility, movements of workers across countries, and the spread of technology across countries.

##### **A. Other Influences of International Trade on Labor Markets**

Trade can have effects on labor markets beyond shifting labor demand from unskilled to skilled workers and thus changing factor demands and wages. One such effect is that of import competition on interindustry wage differentials, the phenomenon in which seemingly equivalent workers are paid more in some industries than in others. The models discussed in Section III typically assume perfectly mobile factors within each country, so that unskilled workers earn the same wage in all industries. However, Katz and Summers (1989) and others document that some industries (e.g., aerospace, petroleum, and tobacco companies) pay their workers more than similar workers in other industries, and that these differences in compensation are persistent across time. While the existence of these interindustry wage differentials is well established, there is less consensus about their cause. One explanation is that they reflect unobserved worker characteristics and are thus consistent with competitive labor markets--for example, it may be that Boeing attracts more highly skilled mechanics than other companies, even though its workers have substantially the same age, education, and other job market characteristics as those in lower-paying industries. The other explanation, which likely applies to unionized industries such as autos and steel, is that higher wages reflect rents shared with workers by firms earning extranormal profits in imperfectly competitive product markets, where union bargaining power allows workers to extract the rents.

If the latter explanation is correct, international trade can affect wages by influencing product market competition and thus the profitability of firms. Abowd and Lemieux (1993)

assess whether product market competition affects union wage agreements in Canada. Since wage settlements and firm performance are obviously linked, they assume that trade competition as measured by Canadian import prices affects firm performance independent of union agreements. They find that firm performance, and thus import competition, matters greatly for wage agreements in these unionized industries. For manufacturing industries in the United States, however, Basu and Fernald (1997) show that there are only small markups of price above marginal cost and thus few rents to be affected by import competition.

Depending on the nature of wage bargaining, import competition that squeezes firms' profits can lead not only to smaller wage premia in high-wage industries, but also to a reordering of the differentials across industries as unskilled workers in declining industries such as steel find their wages falling behind wages of unskilled workers in more successful industries. Katz and Summers further show that the ranking of industry wage differentials looks similar across countries. Given this, if an industry becomes more competitive worldwide (perhaps as a result of trade liberalization), this would be expected to result in both lower wages and smaller wage differences across countries.

This is important because many of those who oppose free trade do so not because of the redistributive effects *within* countries, but rather because they worry about the equalizing effects of trade *across* countries. For example, a prime concern of U.S. critics of the North American Free Trade Agreement (NAFTA) has been that import competition will force wages for unskilled workers in the United States down to the level of Mexican wages, while similar fears have more recently been voiced more generally in many advanced economies that the increased volume of trade with developing countries will lower wages to developing country levels.

Free trade can in principle equalize wages across countries, an outcome referred to as "Factor Price Equalization" (FPE). Trade allows for the exchange of factor services across national boundaries, and under certain conditions this is sufficient to equalize factor prices across countries even though the factors themselves do not move across borders. The idea is that each country exports services of factors with which it is relatively well endowed and imports its scarce factors. Trade thus increases the effective relative supply of each country's scarce factors, thereby decreasing their prices, and decreases the relative supply of the abundant factors, increasing their prices. These within-country factor price changes lead to convergence of factor prices across countries. If factor price equalization obtains between the United States and Mexico, then NAFTA would lower the wages of less-skilled workers in low-skilled-labor-scarce America and raise wages of less-skilled workers in low-skilled-labor-abundant Mexico until the same wage structure prevails in both countries.

However, there are important caveats to this theoretical possibility. One is that it holds only under a set of rather restrictive assumptions: identical consumer tastes and production technologies across all countries, perfect factor mobility across industries within each country, and production of the same mix of goods across all countries. Relaxing these assumptions even slightly provides for cases in which trade does not equalize wages across

countries--an example of this would be if labor were more efficient in one country than in another, a situation which is surely relevant for the case of NAFTA. The other caveat is that the theory under which factor price equilibrium occurs refers only to a steady state equilibrium, but provides no information as to the path of wages during trade liberalization.<sup>8</sup> Leamer (1995) proposes a dynamic analogue to the FPE theorem called the Factor Price Convergence theorem: "When two countries eliminate their mutual trade barriers, product price equalization eliminates factor price differences" (p. 7). Yet Leamer acknowledges that for this theorem to hold requires a particular combination of factor supplies, tastes, technology, and the distribution of production across countries. Deardorff (1984) examines a case in which this combination does not hold, with the result that trade liberalization actually causes cross-country wages to diverge rather than converge.

Nevertheless, under some circumstances, a movement toward free trade can lead to convergence of factor prices across countries. Ben-David (1993) and Sachs and Warner (1995) identify historical episodes of per capita income convergence across countries and argue that movements toward free trade contributed to these episodes. Ben-David examines the European Community and finds that episodes of trade liberalization among members tended to be followed by convergence in per capita incomes. Sachs and Warner divide countries into those that were "open" and those that were closed to trade in 1970, based on a collection of measures including trade as a share of output and black market premia on exchange rates. They find strong evidence of convergence of per capita income between 1970 and 1985 for the group of open economies but no convergence for the closed group.

These results are interesting in that they are consistent with the explanation that the movement towards free trade has helped to equalize international factor prices. However, Slaughter (1997) emphasizes that consistency does not imply causation. Data on per capita income combine both factor prices and factor quantities, but the factor price equalization theorem is about factor prices only. Convergence of per capita income might be caused by convergence in factor quantities rather than factor prices--that is, wages rise in countries which liberalize trade because these countries enjoy a deepening of their capital stock as a result of the liberalization. Convergence of technological progress through technology spillovers would have similar implications. Slaughter demonstrates that the episodes presented by Ben-David and Sachs and Warner are for the most part instances of convergence in per capita capital stocks rather than factor prices.

A direct approach to determining the extent to which wages across countries are becoming more equal would be to compare wage levels across countries. However, this would face two problems: finding measures of wages for similar types of labor across many countries, and then settling on the exchange rate at which to convert wages denominated in national currencies into a common currency. Slaughter (1995b) avoids these issues by

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<sup>8</sup>In contrast, the Stolper-Samuelson theorem is explicitly a theory about changes in factor prices in response to changes in the external economy.

analyzing the effect on wages of the construction of canals and railroads in the United States in the early 1800s. He finds that the new transportation infrastructure dramatically lowered transportation costs and thus led to convergence of commodity prices across regions in the United States. But wages across regions changed by very little, as regional differences in technology and the output mix prevented strong wage convergence. This again demonstrates that free trade would not be expected to equalize wages across countries with different levels of productivity.

A third channel through which trade affects labor markets relates to changes in the elasticity of demand for factors--the degree to which changes in wages lead to changes in the quantity of labor demanded by firms. In models with either perfect or imperfect competition, increased import competition makes factor demands within an industry (and factor demands by firms under imperfect competition) more elastic for a country. When factor price equalization obtains, countries exhibit completely elastic demand schedules for factors so that changes in factor prices give rise to large movements in factor demands. If domestic factor prices rise above the prevailing world level, domestic firms cannot keep costs below world prices and lose market share to foreign firms. Trade thus affects wages by amplifying the effect of changes in costs on production and thus on labor demand.

The effect of trade competition on factor demand elasticities is independent of the direct effect of trade on factor prices. Indeed, a country in which relative product prices happen by coincidence to already match world prices will experience no change in factor prices in opening to trade. But when factor price equalization holds, factor demands in that country become infinitely elastic so that any subsequent change in factor prices will have large effects on product and labor markets. One effect is that more elastic demand generally implies less power for workers in bargaining with firms over the division of rents, since with elastic labor demand an increase in wages will lead firms to hire substantially fewer workers than if labor demand were inelastic.

Slaughter (1996a) applies this theory to more realistic situations in which a movement toward free trade makes factor demands more elastic, but not infinitely so. While he finds that between 1960 and 1990 the majority of U.S. manufacturing industries experienced increases in labor demand elasticities, there is only a weak correlation between these increases and measures of industry exposure to international trade.

## **B. Capital Mobility and Labor Markets**

Capital flows that change a country's stock of capital relative to labor potentially affect relative factor prices. The volume of capital flows across borders has increased rapidly since about 1970, growing at a rate much higher than that of international trade in products.<sup>9</sup> As discussed in the May 1995 *World Economic Outlook* (p. 80), cross-border financial

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<sup>9</sup>See Goldstein and Mussa (1993).

transactions in most advanced economies expanded from less than 10 percent of GDP in 1980 to well in excess of 100 percent of GDP in 1992.

The claim is often made that outflows of capital from advanced economies have lowered wages, as multinational firms establish and/or expand overseas affiliates, to which the firms then "export" or "outsource" jobs. Slaughter (1995a) shows that this process of outsourcing can generate the within-industry demand shifts towards skilled labor that have in fact occurred across most U.S. industries. However, using detailed firm-level data on the activity of U.S. multinationals, he finds that outsourcing contributed little to rising U.S. income inequality during the 1980s. He constructs a set of stylized facts about the employment, investment, and production patterns of these firms and finds that most of the facts are inconsistent with widespread outsourcing. He also estimates the factor price elasticities of demand between parent and affiliate labor to test whether these firms substitute heavily between labor in the two locations. The results indicate that home and foreign labor are at best weak substitutes and in fact might be complements.

Feenstra and Hanson (1995, 1996) also explore outsourcing, but they do not restrict the definition of this activity to multinationals and their direct affiliates. The goal is to examine cases such as Nike, which has shoes assembled in southeast Asia by independent contractors rather than by Nike affiliates. For U.S. manufacturing firms, they proxy the extent of outsourcing by the share of inputs to production estimated to come from abroad, although they do not distinguish the imported intermediate goods as coming from either developing or advanced economies. They find that the growth of imported intermediates accounts for 15 to 33 percent of the decline in the share of wages going to unskilled production workers. However, only about one third of these imports are from developing countries, so that the effect of outsourcing to low-wage countries is likely to be far smaller. As with import competition directly measured by import prices or quantities, outsourcing appears to have had only a modest effect on wages of unskilled workers in the United States, and even the effects of trade flows and capital movements summed together remains smaller than the share of changes in inequality explained by technology-driven changes in labor demand.

Countries other than the United States share many of the same concerns about the effect of capital flows on wages. For example, German firms are increasingly outsourcing production activity to eastern European countries. This phenomenon of "Standortwettbewerb" (locational competition) has received much popular attention, but less formal analysis, so that research on the effects of this activity would be quite valuable. Fitzenberger (1996) finds that trade has hurt less-skilled workers in Germany since 1970.

Slaughter (1996b) shows that another effect of capital mobility on labor markets might be that enhanced capital mobility increases the degree to which workers bear the costs of adjustment to terms of trade shocks. As discussed earlier, the basic insight of the Stolper-Samuelson theorem is that changes in product prices affect factor prices by leading to shifts in relative demands for factors of production. Exactly how factor prices change can be

complicated in models with more than two factors of production, but the key idea is that all factor prices absorb the product price shock.

However, increased capital mobility narrows the range of movement in capital rental rates within a country since as a country integrates its capital market with the rest of the world, risk-adjusted rates of return increasingly match "world" rates. With perfect capital mobility, the rate of return would exactly equal that in the rest of the world, as deviations from world returns are arbitrated away by capital flows.<sup>10</sup>

If movements in the return to capital are constrained by increased capital mobility, then the effects of terms of trade movements cannot be absorbed equally by all factors of production, so that labor, both more skilled and less skilled, must absorb more of any product price changes. Increased capital mobility thus potentially results in increased volatility of wages in response to external shocks. This would lead to higher wage dispersion if wages of low-skill workers adjust more readily than those of high-skill workers. In Europe, the combination of returns to capital fixed by capital mobility and wages for low-skill workers which are essentially fixed in real terms by structural rigidities means that the impact of terms of trade shocks falls instead on the number of workers hired rather than on wages. Increased capital mobility thus potentially magnifies the effect of external shocks on European unemployment.

### C. Labor Mobility and Wages

Movements of labor across countries can also affect wages. The main issue in the advanced economies is whether immigration of less-skilled workers from developing countries depresses the relative earnings of less-skilled natives. In contrast to the smaller role they attribute for imports, Borjas, Freeman, and Katz (1992, 1996) estimate that as much as one-third of the overall increase in wage inequality in the United States can be attributed to increased immigration during the 1980s, an effect two to three times as large as that of imports. Borjas (1994) argues that studies that find only small effects of immigration neglect important aspects of the effect of immigration on wages, because these studies typically look for wage effects only in the local labor market where the immigration under study was concentrated, rather than on the country wide effects. For example, Card (1990) finds that the 1980 Mariel boatlift of Cubans into Miami did not depress wages of less-skilled workers in that city compared to nearby cities which did not experience the immigration. Borjas claims that this misses the fact that less-skilled natives adjusted to the influx of immigrants by moving out of Florida altogether. To capture the effect of immigration, Borjas asserts that one must look at national rather than local labor markets.

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<sup>10</sup>A vast literature starting from Feldstein and Horioka (1980) suggests that the degree of global capital mobility, though increasing, might be less than is indicated by the growth of capital flows alone.

In recent years, many European countries have experienced larger flows of labor relative to their populations both inward and outward than the United States. Mirroring the cross-Atlantic difference in labor markets, immigrants in European countries are typically blamed for causing increases in unemployment rather than declines in wages as in the United States. Zimmerman (1996) summarizes research that finds generally statistically significant effects of immigration on wages and unemployment in Germany, with the adverse effects falling entirely on blue-collar workers while white-collar wages and employment actually rise. Moreover, rigidities in European labor markets limit the speed of adjustment to changes such as migration and import competition, so that any adverse effects may tend to be longer-lasting than in the United States.

Friedberg (1996) finds that the recent influx of migrants from the former Soviet Union to Israel has not affected the structure of relative wages in Israel. This is because many of the new immigrants, though to a large degree highly-skilled workers such as scientists and engineers, initially took jobs at wages and skill levels below those they left behind, and thus did not put downward pressure on wages of high-skilled Israeli natives.

Immigration can also lead to increased growth, particularly if, as in the case of Israel, immigrants bring with them human capital that offsets the initial decrease in the per capita stock of physical capital that results from the immigration. In this case, the immigration potentially leads to increased investment as the higher levels of human capital raise the return to physical capital. The increase in investment would then be expected to lead to both higher wages and output. In recent years, however, immigrants to most advanced economies have had on average lower levels of human capital than natives, suggesting that economy-wide growth effects from recent flows of immigration will be less immediate.

#### **D. Technology Flows and Wages**

Although technology is not usually modeled as a factor of production, international technology flows across countries can also affect wages. An inflow of technology can raise factor prices by increasing productivity, with the particular effects depending on the nature of the technology, which can be biased towards enhancing the productivity of capital or labor. In general, however, one would expect wages across countries to become more equalized as technology and production techniques spread across countries. Increased trade may contribute to innovation and the spread of technology, and thus indirectly affect wages.

One potential channel through which technology flows across countries is the transfer of technology by multinational firms from the parent to the affiliate countries. Aitken, Harrison, and Lipsey (1996) find evidence of this for Mexico, Venezuela, and the United States. For all three countries, they find that a higher level of foreign investment in a particular industry is associated with higher wages in that industry. In Mexico and Venezuela, however, FDI appears to raise wages only within the plants of the foreign affiliates; there is no evidence that the technology "spills over" to increase wages or productivity in domestically owned firms.

Coe and Helpman (1995) and Coe, Helpman, and Hoffmaister (1997) examine whether technology moves across countries through trade flows. Using data for 77 developing countries and 22 advanced economies from 1971 to 1990, they find that the more these countries import from advanced economies that carry out a lot of research and development, the higher is total factor productivity growth. Eaton and Kortum (1996) find similar results. They estimate that advanced economies generate at least 50 percent of their productivity growth through imports from and proximity to the United States, Japan, and Germany--the three countries that generate most of the inventions in the advanced economies. These studies suggest that trade spurs the transfer of technology across countries. While neither study examines the link between technology transfer and wages in the importing countries, wages would generally be expected to rise as technology increased productivity. Of course, there could be distributional effects were the productivity-enhancing effects of technology to favor a particular segment of the workforce.

## V. PUBLIC POLICY ISSUES RELATED TO GLOBALIZATION

Increased globalization has been viewed with concern in many advanced economies, with the belief common that globalization harms the interests of workers, especially unskilled workers, either directly through immigration or indirectly through trade and capital mobility. Particularly with respect to import competition, these beliefs appear to be at odds with the empirical evidence discussed above that this aspect of globalization has had only modest effects on wages, employment, and income inequality in the advanced economies.

What is interesting about these beliefs is the apparent perception that policies to counter the effects of globalization would improve national welfare. This contradicts the historical evidence that free trade and factor mobility improve global welfare and tend to improve national welfare for all countries involved (this is almost always the case for trade, though not always for factor mobility). Although free trade and factor mobility tend to improve national welfare, some would argue that restrictions might be justified under particular circumstances. One would be concerned about the distribution of welfare within a country, since globalization produces winners and losers despite the overall benefits. Policy makers might choose to forego some aggregate welfare gains in order to improve the welfare of particular constituents such as less-skilled labor. However, restrictions on trade flows or capital movements are typically second-best policies compared to measures which directly compensate parties who do not share in the gains from globalization.

On the other hand, increased globalization can exacerbate the effects of preexisting economic problems, such as the phenomenon in which the combination of wage rigidity and capital mobility in Europe magnifies the impact of external shocks on unemployment. However, policies which seek to limit economic integration will dilute the benefits of globalization, which come in the form of lower prices for imports, as well as the increased flow of capital and technological innovations across countries. Rather than attempting to limit or delay globalization, the appropriate policy response is instead to address the

underlying structural rigidities that prevent labor markets from adjusting to external shocks. In this respect, education and training have important roles to play, since these are important means by which workers in the advanced economies can upgrade their skills to match the demands of the changing global economy.

There might also be long-term concerns about income distribution. Benabou (1993) and Galor and Zeira (1993) develop analytical frameworks in which increased inequality potentially slows human capital formation for the entire economy. The basic idea is that greater income inequality isolates the less skilled from the institutions of human capital formation. For example, inequality can aggravate existing capital market imperfections and slow private investment in education; it can shift voters' preferences away from funding public education and other forms of public infrastructure and can segment the population across jobs and residences in a way which limits the social and economic benefits derived from mixing different groups of people. If globalization results in isolation--financial, geographical, intellectual, or otherwise--those most affected by these changes may not have the resources needed to invest in the process of transition. If human capital growth in particular groups suffers as a result of globalization, the consequent economy-wide effect of lower productivity growth might make even the more skilled worse off as well.

Another policy consideration might be the existence of short-term adjustment costs. The adjustment of workers displaced by import competition occurs slowly and with significant costs, such as the need to obtain information about new opportunities, relocation, and the loss of firm- or industry-specific knowledge.<sup>11</sup> For example, Blanchard and Katz (1992) find that U.S. regional labor markets take several years to fully recover from declines in aggregate demand. They also find that most of this adjustment entails people moving out of the affected region rather than wages adjusting downward to maintain employment. Even though empirical research suggests that trade has only modest effects on workers, some government action may be required to ensure the existence of a social safety net so that those who are displaced do not become marginalized. It is important, however, that any such actions provide incentives for workers and firms to adjust to and therefore gain from changes in the global economic environment.

The adjustment costs can be minimized by encouraging flexible labor markets and by reducing structural rigidities facing firms, such as onerous work rules, staffing requirements, and hiring and firing costs. Other policies might include gathering and spreading information about labor market conditions, standardizing professional certification procedures across countries, and enhancing training and educational opportunities. These issues seem relevant both for European countries in which structural rigidities such as centralized wage bargaining and extensive hiring and firing costs inhibit labor mobility, and for the United States, where

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<sup>11</sup>See Rodrik (1997) for a discussion of social dislocations that have accompanied changes in the global economy.

problems with the educational system are widely believed to limit the growth of the skilled workforce.

Unfortunately, policymakers with short political time horizons might be more concerned with avoiding the short-term adjustment costs which result from globalization and technological progress rather than with the long-term benefits of free trade, increased factor flows, and labor market reforms.

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