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## Are Your Wages Set in Beijing?

Richard B. Freeman

**I**n the 1980s and 1990s, the demand for less-skilled workers fell in advanced countries. In the United States, this showed up primarily in falling real wages for less-educated men, although hours worked by these men also declined. In OECD-Europe, it took the form of increased unemployment for the less skilled. Over the same period, manufacturing imports from third world countries to the United States and OECD-Europe increased greatly. In 1991, the bilateral U.S. merchandise trade deficit with China was second only to its deficit with Japan.<sup>1</sup>

The rough concordance of falling demand for less-skilled workers with increased imports of manufacturing goods from third world countries has created a lively debate about the economic consequences of trade between advanced and developing countries. This debate differs strikingly from the debate over the benefits and costs of trade in the last few decades. In the 1960s and 1970s, many in the third world feared that trade would impoverish them, or push them to the periphery of the world economy; virtually no one in advanced countries was concerned about competition from less-developed countries. In the 1980s and 1990s, by contrast, most of the third world has embraced the global economy; whereas many in the advanced world worry over the possible

<sup>1</sup>The 1992 merchandise trade net deficit was \$18 billion for mainland China and \$50 billion for Japan; for “Greater China” (including Taiwan and Hong Kong) the deficit was \$28 billion; for the rest of the world it was \$16 billion.

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adverse economic effects of trade. The new debate focuses on one issue: whether in a global economy the wages or employment of low-skill workers in advanced countries have been (or will be) determined by the global supply of less-skilled labor, rather than by domestic labor market conditions. Put crudely, to what extent has, or will, the pay of low-skilled Americans or French or Germans be set in Beijing, Delhi and Djakarta rather than in New York, Paris or Frankfurt?

On one side of the new debate are those who believe in factor price equalization—that in a global economy the wages of workers in advanced countries cannot remain above those of comparable workers in less-developed countries. They fear that the wages or employment of the less skilled in advanced countries will be driven down due to competition from low-wage workers overseas. On the other side of the debate are those who reject the notion that the traded goods sector can determine labor outcomes in an entire economy or who stress that the deleterious effects of trade on demand for the less skilled are sufficiently modest to be offset readily through redistributive social policies funded by the gains from trade. They fear that neoprotectionists will use arguments about the effect of trade on labor demand to raise trade barriers and reduce global productivity.

The debate has created odd divisions and bedfellows among economists and within the broader society.

There is, first, an Atlantic Divide in the importance that is accorded trade (which is mirrored by the two papers that follow). American economists generally conclude that trade is not the primary cause of the economic problems of low-skilled workers in advanced countries. European economists, by contrast, generally champion the view that trade with the third world has caused joblessness in Europe and rising inequality in the United States. What is odd is that imports from developing countries are a greater share of GNP and increased more in the United States in the 1970s and 1980s than in the European Union. For example, U.S. imports from less-developed countries were 0.4 percent of GNP in 1970, before rising to 2.5 percent of GNP in 1990. Meanwhile, in the European Union, imports from less-developed countries increased from 0.5 percent in 1970 to 2.1 percent of GNP in 1990.<sup>2</sup>

Second, there is disagreement over the appropriate mode of analysis to assess the effects of trade on income distribution. Labor economists and some trade economists estimate the potential loss of low-skill employment in import-intensive industries by comparing employment in those sectors with what employment might be if imports were produced domestically. Some trade economists favor analyses that examine the effects of trade on the prices of goods produced by low-skill workers. What is unexpected is that the techniques are more complementary than opposite and give the same substantive answer: both

<sup>2</sup>These data are from the World Bank computer files.

find that, barring strong auxiliary assumptions, trade is not *the* cause of the labor market woes of less-skilled workers.

Third, there is a divide between professionals and populists. Most economists, including those who believe trade has caused immiseration of less-skilled workers, are opposed to renewed protectionism. They are opposed because such a policy would reduce national output, some of which could be redistributed to the less skilled. Most participants in the debate favor policies to upgrade skills, and many favor more direct redistributive schemes to deal with the immiseration of low-skill workers. Just as an environmental cure, glasses, resolves a largely genetic disease of myopia, so too can nontrade policies resolve the possible distributional costs of trade. By contrast, in the broader community, many in the disparate coalition of consumer advocates, union leaders, billionaires (Ross Perot in the United States; Sir James Goldsmith in Europe), and conservatives who believe that trade caused the job market problems of the less-skilled favor protectionism.

Fourth, there is a division between trade theorists and other economists about the possible relevance of the forces for factor price equalization to the real economy. Had you asked me a decade ago whom I would have expected to champion the idea that trade is important in income distribution, I would have said trade theorists, if only from self-interest. After all, what greater triumph for a fundamental proposition of trade theory than to explain the problem of rising inequality in earnings and employment in the late twentieth century? However, some trade experts have been in the forefront of those rejecting factor price equalization. By contrast, nontrade economists have taken factor price equalization more seriously.

This paper provides a viewer's guide to the debate. I review the two facts that motivate the debate: the immiseration of less-skilled workers in advanced countries and the increase in manufacturing imports from less-developed countries. Then I summarize the arguments and evidence brought to bear on them and give my scorecard on the debate. I conclude by examining the fear that, whatever trade with less-developed countries did in the past, it will impoverish less-skilled Americans and western Europeans in the future, as China, India, Indonesia and others make greater waves in the world economy.

## **The Immiseration of Low-Skill Workers in the United States and Europe**

An economic disaster has befallen low-skilled Americans, especially young men. Researchers using several data sources—including household survey data from the Current Population Survey, other household surveys, and establishment surveys—have documented that wage inequality and skill differentials in

earnings and employment increased sharply in the United States from the mid-1970s through the 1980s and into the 1990s. The drop in the relative position of the less skilled shows up in a number of ways: greater earnings differentials between those with more and less education; greater earnings differentials between older and younger workers; greater differentials between high-skilled and low-skilled occupations; in a wider earnings distribution overall and within demographic and skill groups (Mishel and Bernstein, 1994; U.S. Department of Labor, 1994); and in less time worked by low-skill and low-paid workers (Topel, 1993).

If the increase in earnings inequality had coincided with rapidly growing real earnings, so that the living standards of low-skill workers increased or fell a trifle, no one would ring alarm bells. But in the past decade or two, real earnings have grown sluggishly at best, and fallen for men on average.<sup>3</sup> The economic position of low-skill men has fallen by staggering amounts. For instance, the real hourly wages of males with 12 years of schooling dropped by some 20 percent from 1979 to 1993; for entry-level men with 12 years, the drop has been 30 percent! The real hourly earnings of all men in the bottom decile of the earnings distribution fell similarly since the early or mid-1970s, while that of men in the upper decile has risen modestly—producing a huge increase in inequality.<sup>4</sup>

Similar economic forces have led to somewhat different problems in Europe. For most of the period since World War II, OECD-Europe had lower unemployment rates than the United States. For example, in 1973, the rate of unemployment was 2.9 percent for OECD-Europe compared to 4.8 percent for the United States, and the ratio of employment to population was as high in Europe as in the United States. This changed in the 1980s. From 1983 to 1991 unemployment averaged 9.3 percent in OECD-Europe compared to 6.7 percent in the United States. Unemployment in OECD-Europe seems destined to remain above American levels throughout the '90s decade. The ratio of employment to the population of working age and the hours worked per employee has also fallen in Europe relative to the United States, adding to the U.S.-Europe gap in the utilization of labor. In addition, unemployment has been highly concentrated in Europe: in OECD-Europe, nearly half of unemployed workers are without jobs for over a year, compared to less than 10 percent of unemployed workers in the United States. The employment problem in Europe has generated numerous studies, culminating in the OECD Jobs Study (1994a).

If wage inequality had risen in Europe as much as in the United States, or was near U.S. levels, or if the real wages of low-skill Europeans had fallen, high joblessness would be a devastating indictment of European reliance on institutional forces to determine labor market outcomes. In effect, Europe would be

<sup>3</sup>The magnitude of change in real earnings depends on the years covered, the deflator used and treatment of fringe benefits.

<sup>4</sup>These figures are from Mishel and Bernstein (1994).

suffering unemployment with no gain in equality. But in general, Europe has avoided an American level of inequality or changes in inequality, and wages at the bottom of the distribution rose rather than fell (Freeman and Katz, 1994).<sup>5</sup> By the early 1990s, workers in the bottom tiers of the wage distribution in Europe had higher compensation than did workers in the bottom tiers in the United States (Freeman, 1994). Western Europe's problem was one of jobs, not of wages: the workers whose wages have fallen through the floor in the United States—the less skilled and (except in Germany) the young—were especially likely to be jobless in Europe.

The rise in joblessness in Europe is thus the flip side of the rise in earnings inequality in the U.S. The two outcomes reflect the same phenomenon—a relative decline in the demand against the less skilled that has overwhelmed the long-term trend decline in the relative supply of less-skilled workers. In the United States, where wages are highly flexible, the change in the supply-demand balance lowered the wages of the less skilled. In Europe, where institutions buttress the bottom parts of the wage distribution, the change produced unemployment. The question then is not simply why the United States and Europe experienced different labor market problems in the 1980s and 1990s, but what factors depressed the relative demand for low-skill labor in both economies?

## **Trade Between the United States and Europe with the Third World**

One thing that distinguishes the 1980s and 1990s from earlier decades following World War II is the growth of the global economy, which in practical terms can be seen in reduced trade barriers, increased trade, highly mobile capital, and rapid transmission of technology across national lines. Multinationals, who locate plants and hire workers almost anywhere in the world, have replaced national companies as the cutting edge capitalist organization. The most commonly used indicator of globalization is the ratio of exports plus imports to gross domestic product. In the United States, this ratio rose from 0.12 in 1970 to 0.22 in 1990. Trade ratios rose substantially throughout the OECD (OECD Jobs Study, 1994, ch. 3). Although most trade is among advanced countries, trade with less-developed countries increased greatly. By 1990, 35 percent of U.S. imports were from less-developed countries, compared with 14 percent in 1970. In the European Community, 12 percent of imports were from less-developed countries, compared with 5 percent in 1970. (The less-developed country portion of European trade is lower largely because trade among U.S. states doesn't count as imports and exports, while trade among European countries does, thus inflating the overall total of intra-Europe trade.)

<sup>5</sup>The United Kingdom is a mixture. Inequality has risen as in the United States; unemployment has risen as in Europe. But real earnings, even for those in the bottom decile, have also risen.

In 1992, 58 percent of less-developed country exports to the western industrialized nations consisted of (light) manufacturing goods (OECD, 1994b), compared with 5 percent in 1955 (Wood, 1994).

The increase in manufacturing imports from less-developed countries presumably reflects the conjoint working of several forces. Reductions in trade barriers must have contributed: why else the huge international effort to cut tariff and nontariff barriers embodied in GATT, NAFTA, WTO and other agreements? The shift in development strategies of less-developed countries, from import substitution to export promotion, must also have played a part. Perhaps World Bank and IMF pressures on less-developed countries to export as a way of paying off their debts contributed as well. Advanced country investments in manufacturing in less-developed countries also presumably increased their ability to compete in the world market.

Changes in the labor markets of less-developed countries have also contributed to the increased role of those countries in world markets. The less-developed country share of the world workforce increased from 69 percent in 1965 to 75 percent in 1990; and the mean years of schooling in the less-developed country world rose from 2.4 years in 1960 to 5.3 years in 1986.<sup>6</sup> The less-developed country share of world manufacturing employment grew from 40 percent in 1960 to 53 percent in 1986. Finally, diffusion of technology through multinational firms has arguably put less-developed countries and advanced countries on roughly similar production frontiers. Skills, capital infrastructure, and political stability—rather than pure technology—have become the comparative advantage of advanced countries.

Given these two facts, it is natural to pose the question: to what extent might trade with less-developed countries be reducing demand for less-skilled labor in the advanced countries?

## **Economic Theory: Factor Price Equalization**

At the conceptual heart of the debate over the effects of trade on the labor market is the strength of forces for factor price equalization. Consider a world where producers have the same technology; where trade flows are determined by factor endowments, so that advanced countries with many skilled workers compared to unskilled workers import commodities made by less-skilled workers in developing countries, while developing countries with more unskilled labor import commodities made by skilled labor in advanced countries; and where trade establishes a single world price for a good. Trade makes less-skilled labor in advanced countries and skilled labor in developing countries less scarce and can thus be expected to reduce their wages. By contrast, trade will increase the production of goods made by skilled labor in advanced countries and by

<sup>6</sup>My tabulations are based on World Bank data for individual countries given in the Bank's publicly available diskettes on Social Indicators.

less-skilled labor in developing countries and can thus be expected to raise their wages. In equilibrium, under specified conditions, the long-term outcome is that factor prices are equalized throughout the world: the less-skilled worker in the advanced country is paid the same as his or her competitor in a developing country; and similarly for the more-skilled workers.

But does factor price equalization (appropriately qualified to fit an  $n$ -factor/ $n$ -good world) capture economic reality? For years, many trade economists rejected factor price equalization as a description of the world. The wide, and in some cases increasing, variation in pay levels among countries seemed to make it a textbook proposition of little relevance.<sup>7</sup> Reflecting this view, in the recent debate Bhagwati and Dehejia (1994) have enumerated some of the “extraordinarily demanding” assumptions needed to establish factor price equalization. These include: identical technology and tastes; similar ranking of sectors by skilled to unskilled and capital to labor intensity at all prices; absence of scale effects; and perhaps most important, that countries are incompletely specialized—that is, they produce the full set of traded goods. Norman and Venables (1993) stress that in a Hecksher-Ohlin model where costs of trade are nonnegligible, goods trade alone does not equalize factor prices; flows of capital or labor would also be needed.<sup>8</sup> Other trade economists, however, treat factor price equalization as a core proposition of international economics (Leamer, 1984).

To labor economists, the observation that trade with less-developed countries places some economic pressures on low-skill westerners is a valuable reminder that one cannot treat national labor markets in isolation. If the West can import children’s toys produced by low-paid Chinese workers at bargain basement prices, surely low-skilled westerners, who produce those toys at wages 10 times those of the Chinese, will face a difficult time in the job market. It isn’t even necessary that the West import the toys. The threat to import them or to move plants to less-developed countries to produce the toys may suffice to force low-skilled westerners to take a cut in pay to maintain employment.<sup>9</sup> In this situation, the open economy can cause lower pay for low-skilled westerners even without trade; to save my job, I accept Chinese-level pay, and that prevents imports. The invisible hand would have done its job, with proper invisibility.

For the factor price equalization argument to carry weight, advanced countries should export commodities to less-developed countries made with relatively skilled labor and import commodities from less-developed countries produced by unskilled labor. U.S. trade operates in just this way. American

<sup>7</sup>For an exception to the prevailing view, see Krueger (1968).

<sup>8</sup>Wood (1994) argues that capital is so mobile that differences in capital should not be viewed as endowments. But the positive correlation between savings and investment rates found by Feldstein and Horioka (1980) implies that capital is not so mobile.

<sup>9</sup>As an example, in early 1995, the head of the Confederation of British Industry declared that western workers would have to lower wage expectations to compete in the global market with low-wage workers from developing countries (*Financial Times*, Jan. 13, 1995).



exports are skill intensive: our net exports are positive for such goods as scientific instruments, airplanes, and in intellectual property, including software. Imports make less intensive use of skilled labor: our net imports are positive for toys, footwear and clothing. Europe also imports low skill intensive goods from less-developed countries and exports high skill intensive goods. While factors other than labor skills affect trade—natural resource endowments, infrastructure capital, perhaps capital overall, technological changes that diffuse slowly—the flows of goods between advanced countries and less-developed countries seems to fit the Heckscher-Ohlin model well enough (Leamer, 1984) to raise the specter of factor price equalization for low-skilled westerners.

The argument for complete factor price equalization is, to be sure, an extreme one. It implies that in an economy fully integrated in the world trading system, domestic market developments have *no* effect on wages. Instead, there is a single global labor market that sets the factor prices for inputs, even if trade is only a small part of the economy. Whether 5 percent or 95 percent of less-skilled workers are employed in import-competing activities, their pay is determined in Beijing. Transportation costs, immediacy of delivery, and such factors are assumed to be irrelevant in differentiating the location of production. If unskilled labor can readily switch from traded goods to nontraded goods, it would be a single factor, so that the pay of even those working in nontraded goods or services would be set in the global market. Only when *all* less-skilled workers are employed in nontraded activities or if those in nontraded activities have sector-specific skills that make them “different” from workers in traded activities (for some period) will their pay depend on domestic market considerations.

These predictions run counter to a wide body of evidence that domestic developments do affect wages: for instance, that the baby boom affected the pay of young workers; that the relative number of college graduates altered the premium paid for education; that sectoral developments affect pay in certain industries; that your wages are likely to be higher if your firm does well than if it is doing poorly. In the United States, wage differences among states and localities have persisted for decades despite free trade, migration, and capital flows. Among countries, wage differences between workers with seemingly similar skills have also persisted for decades, albeit exaggerated by the divergence between purchasing power parities and exchange rates, and by differences in skills that are hard to measure.

Given these considerations, factor price equalization should not be viewed as the Holy Grail giving the answer of economic science as to why demand fell for low-skill western workers in the 1980s and 1990s. Instead, the theory is a flag alerting us to the possibility that increased linkages with less-developed countries *may have* contributed to the immiseration of the less skilled, and pointing to some routes through which such linkages *may have* worked. The gap between “*may have*” contributed and “*has*” contributed is large—bridgeable only by empirical analysis, with all of its compromises and difficulties.

## Empirical Work

The effort to see whether or not trade has contributed to the growing immiseration of low-skill workers in developed economies has taken two forms. One set of studies exploits data on the “factor content” of import and export industries to estimate the implicit change in factor endowments in advanced countries due to trade. A second set of studies exploits price data to see if increased imports from less-developed countries have induced sizable drops in the prices of goods produced by low-skilled westerners, which would reduce demand for their labor and lower their pay or disemploy them. The debate has drawn attention to problems with both sets of calculations.

### Factor Content Analysis: Can the Tail Wag the Dog?

In factor content studies, analysts estimate the impact of trade on the demand for labor at given wages or, alternatively, on the nation’s “effective” factor endowments, that is, the domestic *and* foreign labor inputs used to produce society’s consumption bundle. Since the U.S. imports goods that make heavy use of low-skilled labor, and exports goods that make heavy use of high-skilled labor, trade with developing countries reduces the relative demand for less-skilled labor in the United States, or, if you prefer, increases the relative supply of less-skilled labor.<sup>10</sup> Given estimates of the labor skills used in various sectors, one can estimate how changes in imports and exports altered the demand-supply balance for high- and low-skilled labor at given relative wages and prices. To see how the changed supply-demand balance for labor skills affected relative wages (the variable of interest in the United States), analysts transform the calculated shifts in quantities into changes in wages using estimates of the effect of changes in supply and demand on relative pay from other studies (for instance, studies of how the increase in the relative supply of college graduates on the domestic labor market affects their relative pay).

For example, if the United States imported 10 additional children’s toys, which could be produced by five American workers, the effective supply of unskilled workers would increase by five (or alternatively, domestic demand for such workers would fall by five), compared with the alternative in which those 10 toys were produced domestically. This five-worker shift in the supply-demand balance would put pressure on unskilled wages to fall, causing those wages to fall in accord with the relevant elasticity. Any trade-balancing flow of exports would, contrarily, reduce the effective endowment of skilled workers (raise their demand) and thus increase their pay. In the context of a standard

<sup>10</sup>The *change* in endowments due to a *change* in trade is estimated as the multiplicand of a matrix of sectoral labor skill inputs ( $a_{ij}$ , where  $i$  = labor skill and  $j$  = industry) and a vector of changes in sectoral imports ( $M_j$ ) minus exports ( $X_j$ ). Since we are measuring a horizontal shift in “quantities,” this is also the change in demand for skill  $i$  at existing wages due to actual trade flows.

trade model, Deardorff and Staiger (1988) show the conditions under which changes in the factor content of trade indicate how trade affects relative factor prices.

Several recent studies use factor content calculations to examine the possible effect of trade on the fall in relative pay of low-skilled workers during the 1980s and 1990s. Borjas, Freeman and Katz (1992) estimate what would happen to the relative employment of less-skilled Americans as a result of the change in trade in the 1980s and conclude that the reduction in employment was modest, due largely to the trade deficit. Sachs and Shatz (1994) analyzed trade flows with less-developed countries with a more extensive data set for the period 1978–1990 and also concluded that increased import penetration from less-developed countries reduced manufacturing employment modestly. Cooper (1994) estimated that the number of less-skilled workers displaced by imports in textiles, apparel and leather was small relative to employment in retail trade, which employs many such workers.

These studies find that changes in actual trade flows have not displaced all that many low-skill workers from manufacturing (taken as the major traded goods sector) for one basic reason: that only a moderate proportion of workers now work in manufacturing. In 1993, roughly 15 percent of American workers were employed in manufacturing. The vast majority of unskilled workers were in nontraded goods, such as retail trade and various services. In such a world it is hard to see how pressures on wages emanating from traded goods can determine wages economy-wide. To be sure, the strong version of factor price equalization argues that the wage of low-skilled labor is set in a global market, affecting workers in both traded goods and untraded services. But this seems implausible. Compare two situations: in the first, 50 percent of the nation's unskilled workers are in import-competing industries, and increased trade with less-developed countries displaces one in 10 of them; in the second, only 1 percent of unskilled workers are in import-competing industries, and trade displaces one in 10 of them. To argue that trade would have the same effect in both cases seems far-fetched, dependent on the simplifying assumptions of the trade model (notably that elasticities of supply are infinite, with no variation in products produced in developed and less-developed countries).

However, Adrian Wood's (1994) factor content study, which he discusses in his paper in this issue, reaches a different conclusion. Wood argues that standard factor content analyses understate the effect of trade on employment. Once the proper corrections are made, he argues, trade becomes the root cause of the fall in demand for less-skilled workers in advanced countries.

Wood (1994) begins by arguing that estimated changes in effective labor endowments, based on existing labor input coefficients in advanced countries, are biased against finding a big disemployment effect. The reason is that less-developed countries export different and noncompeting goods within sectors than the goods produced by advanced countries; for example, the United States might make high-tech toys, while the Chinese make low-tech toys. The

typical factor content analysis would observe the import of low-tech Chinese toys and then multiply that by the quantity of labor, of various skills, used in the U.S. manufacture of high-tech toys. But if the low-tech toys were made in the United States, manufacturers would in fact use more less-skilled labor than in producing high-tech toys. To correct for this possible bias, Wood uses the labor input coefficients for developing countries, adjusted for labor demand responses to higher western wages, rather than those for the advanced countries. With this procedure, he estimates that labor demand due to imports of manufactures fell by “ten times the conventional ones” (Wood, 1994, p. 10).

The problem of differing mixes of products within industries is real. Ideally, one would like the change in labor input coefficients associated with the actual change in goods produced domestically as a result of imports. My guess is that the conventional factor content approach does underestimate the effect of trade on demand for low-skilled labor, but I also suspect that Wood’s upward adjustment is probably excessive.<sup>11</sup>

Wood (1994) also asserts that trade with less-developed countries induced substantial labor-saving innovation in the traded goods sector. This further reduces demand for unskilled labor. Although there is no reason to expect innovation to respond to import competition any more or less than to any other form of competition, the problem of induced technical change is a real one, and Wood’s adjustment is potentially in the right direction. But he may be claiming too much for this factor. For the 1980s, Sachs and Shatz (1994) find virtually no difference in the rate of change of total factor productivity in industrial sectors divided by skill intensity of labor, which runs against Wood’s (1994) argument. They do, however, report that between 1960–1978 and 1978–1989 industrial sectors with lower skill intensity increased their rate of growth of total factor productivity more than sectors with high skill intensity, which could be a response to the greater low-wage competition from less-developed countries in the 1980s. But this is a weak reed. As the evidence stands, the claim that trade induces large labor-saving technological change in low-skill industries is not especially strong.

Standard factor content analysis studies indicate that trade can account for 10–20 percent of the overall fall in demand for unskilled labor needed to explain rising wage differentials in the United States or rising joblessness in Europe. If one accepts Wood’s (1994) adjusted factor content analysis for traded goods and his estimate of induced technological change, then trade accounts for about half of the requisite fall in demand for labor. Where can we find the other half?

As a final step, Wood assumes that trade-induced labor-saving technological changes spill over to nontraded sectors, where most nonskilled workers are employed. This final assumption leads him to conclude that increased trade

<sup>11</sup> Factor content studies use base period labor input ratios by sector to measure skill usage. Thus, the input use in labor-intensive goods that presumably make up the increased imports are included in the sectoral labor usage ratio, but aggregated with the input use of other goods as well.

with less-developed countries accounts for all of the rise of inequality in the United States and all of the increase in unskilled unemployment in Europe.

If one is going to use a factor content approach to attribute immiseration of the less skilled in the West to globalization, Wood's clear and careful approach shows the way. But as he is fully aware, some of the steps along the way are arguable or problematic.

### **Criticisms of Factor Content Studies**

Some trade economists criticize factor content studies because observed trade patterns "do not necessarily capture the effects of price pressures that operate through trade" (Lawrence, 1994, p. 16). Rather, "it is the absence of trade barriers, and not any measure of the volume or terms of trade, that affects factor prices" (Deardorff and Hakura, 1994, p. 78). These economists favor looking at prices rather than quantities to study how trade has affected demand for low-skilled workers. Putting aside the price approach until the next section, I discuss here the problems with the factor content studies that have been raised.

One problem is that factor content calculations treat changes in the production of goods as output shocks that affect employment at *existing* wages. But if wages in a sector adjusted rapidly as imports entered that market, this would reduce the competitive advantage of the foreign workers and limit import flows. In this scenario, the observed rise in imports understates trade pressures because it misses the feedback from domestic wages to imports. At the extreme, it is possible (as noted earlier) that the mere threat of imports may reduce wages absent any trade. If the forces for factor price equalization operate with little trade, or absent trade at all, factor content studies would understate the effects of trade on relative pay. Does this criticism devastate factor content studies? In the United States, the wages of less-skilled labor have fallen sharply, presumably limiting the entry of imports. In this setting, factor content studies may very well understate the contribution of trade to immiseration. If the pay of low-skilled Americans were, say, 20 percent higher, I would expect to see greater imports and accompanying loss of jobs, producing a greater estimated trade-induced disemployment. But the situation is different in western Europe, where labor market institutions maintain the wages of less-skilled labor. With roughly fixed relative wages, factor content studies should give a more accurate picture of trade effects in Europe than in the United States. If they showed much larger trade displacement effects than in the United States, we might reject standard factor content studies in the United States as seriously biased downward. I know of no evidence of larger trade displacement effects in Europe than in the United States.

A second problem is that the standard factor content studies ignore how demand for output may respond to changes in prices. Assume that less-developed countries did not produce low-price children's toys in the 1980s, so that the United States did not import any. The factor content calculations assume that without such imports, consumers would have bought the same amount of domestically produced low-tech goods, despite the fact that they

would presumably be much higher priced than the imports. More likely, consumers would have bought fewer higher-priced low-tech toys and more high-tech toys or other commodities. By ignoring the likely consumer response to higher-priced domestic equivalents of imports, the factor content calculations overstate how much domestic production by low-skilled labor is displaced by imports. What is needed to assess the magnitude of this effect are elasticities and cross elasticities of product demand for various goods, which are not readily available. Wood makes some adjustments for the lower amount of goods that might be sold at a higher domestic price in his calculations, but they are not part of the standard analysis.

Some trade economists criticize standard factor content studies for failing to lay out adequately the counterfactual underlying the calculations. Deardorff and Hakura (1994, p. 78) stress that in the trade model, as in any comparative statics model of prices and quantities, “the volume of trade and the level of wages are simultaneously determined,” so that the effect of trade on wages cannot be meaningfully explored without additional specification of what outside force caused trade to change. This directs attention to two related questions. Why did imports of manufactured goods from less-developed countries increase so much in the 1980s and 1990s? What would have happened to other elements of GDP had imports not risen?

Factor content calculations take the increase in imports as an exogenous event for the receiving country. Imports to the West could have risen for any and all of the reasons given earlier: reductions of trade barriers; increased skills of workers in third world countries; spread of technology that made less-developed country production more competitive. If the increase in trade is due to any of these factors, the assumption that the link is largely from trade to wages or employment is reasonable enough. But if increased imports are caused by increases in wages or technological change in the receiving country due to domestic labor market forces, or to macroeconomic expansion, the change in trade cannot be treated as an exogenous event in the spirit of factor content analysis. Analysts who use the factor content technique have implicitly (Borjas, Freeman and Katz) or explicitly (Wood) assumed that the increase in trade is due to reduced trade barriers, increased skills in developing countries, and the spread of technology, without testing this. One way to test this interpretation of causality is to estimate the effect of some outside factor on the volume of trade, and use the part of trade due to that factor as the independent variable explaining employment or wages (an instrumental variables approach). Ana Revanga (1992) has done this using changes in exchange rates as the factor causing trade flows and found that the effects of trade on employment or wages at an industry level in the United States are not markedly different than the effects estimated by assuming the volume of trade is exogenous to the American labor market.

This still leaves the problem of what might have happened to other parts of GDP absent increased imports. Since no one can say with confidence what would have happened had imports from less-developed countries remained

constant or at the same proportion of GDP over time, perhaps the best response is for analysts to present a range of options, with separate estimated trade effects for each. Barring strong assumptions that reductions in imports would greatly reduce GDP growth, I doubt that such a range would alter the message of most factor content studies that trade has had at most a moderate effect on the demand for unskilled labor in advanced countries.

However, the criticisms and Wood's analysis tell us that while standard factor content studies offer a clue to how trade has affected relative wages, such studies are not the final word. We must look at other evidence as well.

### **Price Effects Studies and Other Evidence**

Two additional bodies of evidence have been brought to bear on this debate: price data on the goods produced by low-skill labor; and data on changes in the employment of skilled and less-skilled workers in industries that produce traded and nontraded goods. In the trade model, price declines in import-competing sectors should lower the relative wages of unskilled labor, which those sectors use intensely, and ultimately the prices of all goods and services produced by those workers. The lower relative pay of the less skilled ought further to lead firms to substitute them for more expensive skilled labor throughout the economy.

Two studies have looked for evidence that the prices of sectors that extensively use unskilled labor have fallen greatly. Lawrence and Slaughter (1993) correlate changes in import prices with the share of production workers across industries and find that when prices are adjusted for changes in total factor productivity, the prices of less skill intensive goods fell only slightly.<sup>12</sup> Sachs and Shatz (1994) examine output prices for all of manufacturing, not just imports, which provides a larger sample of industries. After adjusting for productivity changes that should independently affect prices, they find a modest negative relation between the production worker share of employment and changes in industry prices.<sup>13</sup> They also find that prices fell faster in sectors that make more intensive use of low-skilled workers in the 1980s than in previous decades compared with sectors that use fewer low-skilled workers. They conclude that relative prices exerted some pressure on the pay of the less skilled, but not by enough to account for a significant widening of wage inequality.

The studies of prices have weaknesses. Price data is subject to serious measurement problems. Import prices exist for relatively few industries and cover only some goods in those industries. Output prices suffer from an aggregation problem, since the sectors with imports presumably include domestic goods that differ in important dimensions from the imports. Changes in the

<sup>12</sup> It is necessary to adjust the prices for technological progress (and other forces that might alter prices) to isolate the effect of the fall in the wages of less-skilled labor.

<sup>13</sup> They also include a dummy variable for computers, due to the likely inaccuracy of prices for this good.

quality of products not captured in the indices create measurement error, which may be correlated with the skill intensity of production. The use of the proportion of production workers in an industry as a measure of skill is exceedingly crude since it fails to recognize the difference between production workers across sectors and does not map readily into standard indicators of human capital, such as education or age. Moreover, since unskilled labor is only a modest proportion of cost in most industries (except in activities like untraded personal services, which these studies exclude), finding any link between changes in prices and the fraction of workers who are unskilled is fraught with difficulty.

Perhaps the biggest problem with these studies is that they ignore potential determinants of changes in sectoral prices and potential reasons for the proportion of unskilled workers in a sector to be correlated with changes in prices, save for trade. They do not, for example, examine possible shifts in consumer demand that might affect prices due, say, to increasing GDP per capita. They also ignore the possibility that prices in sectors that intensively use unskilled labor might fall for reasons independent of trade, such as the falling real value of the minimum wage. Consider an economy with no trade at all, but where the minimum wage affects the pay of low-skilled workers. Reduce the minimum and the prices in industries with many unskilled workers should fall, producing a correlation between skill intensity of production and relative prices that has (by assumption) nothing to do with trade. Finding relative price declines in sectors that intensively use less-skilled labor may be necessary to establish a trade effect that operates through prices, but it is not sufficient to establish a trade effect in a world where many forces influence relative prices.

Like the factor content studies, price studies provide a clue to how trade could affect relative wages—the greater the estimated import-induced reduction in the prices of goods produced by low-skill labor, the greater the likely trade effect on wages and employment—but they also are far from the final word.

Some additional evidence has been put forward on the possible connection between trade and wages. For example, as evidence that trade is not the prime cause of the decline in demand for the less skilled, Berman, Bound and Griliches (1992) point out that the ratio of unskilled workers fell in all sectors over this period. If trade was driving down wages of unskilled workers in traded sectors, then some of those workers should be displaced into the nontraded sectors. As a result, the ratio of unskilled workers should be rising or at least holding steady in some sectors. I find it hard to argue that trade is the full story of reduced demand for these workers in the face of the observed decline in the use of less-skilled workers in all sectors.

Those who argue for the importance of trade have also brought other evidence, not directly related to the trade models, to bear as well. Wood (1994) has pointed out that a composite indicator of changes in demand for skills based on changes in wage and unemployment differentials is strongly correlated with the share of imports from less-developed countries across a sample of 14



developed economies. Borjas and Ramey (1994) have found a strong correlation in time series data between the wage differentials between different levels of education and durable goods imports as a share of GDP. They argue that imports of durable goods account for most of the change in the wage differentials, by squeezing economic rents in relatively union-intensive sectors or in sectors that would have had great market power (and rents to share with workers) absent the imports.

## Conclusion

The debate over whether increased trade with less-developed countries is the main cause of the immiseration of the less-skilled has raised numerous conceptual and empirical issues, as well as some hackles. Adherents of one side in the debate, or of one approach to the problem, have found it easy to criticize the other. Most criticisms have at least an element of truth, making scoring the debate a bit of a judgment call. Largely because neither the factor content nor the price analysis comes up with a smoking gun, and because demand for the less skilled has fallen even in nontraded goods sectors, my scorecard reads: trade matters, but it is neither all that matters nor the primary cause of observed changes.

That we lack compelling evidence that trade underlies the problems of the less skilled in the past does not, of course, rule out the possibility that trade will dominate labor market outcomes in the future. Indeed, it is commonplace in the trade-immiseration debate for those who reject trade as *the* explanation of the past decline in the demand for the less skilled to hedge their conclusion by noting that there is a good chance that in the future, pressures for factor price equalization will grow. Maybe your wages were not set in Beijing yesterday or today, but tomorrow they will be.

I have problems with this prognostication. Economists do not have a good record as soothsayers, and neither trade nor labor economists are exceptions. Trade economists once worried about the perpetual dollar shortage; believed that flexible exchange rates would be more stable than fixed exchange rates; and saw the Common Market as the cure-all to European problems. Labor economists declared unions were dead just before the formation of the CIO; worried about the falling return to skills and were as shocked as anyone else by the increased inequality of the 1980s; did not expect the Civil Rights Act to raise the demand for black workers; and so on. For what it is worth, I am not convinced that continued expansion of trade with less-developed countries spells doom for low-skill westerners. As more and more low-skilled western workers find employment in the nontraded goods service sector, the potential for imports from less-developed countries to reduce their employment or wages should lessen. In the standard trade model, a factor used exclusively in nontraded goods has its pay determined by the domestic economy. The closer

western economies get to this situation, the smaller should be the trade-induced pressures on low-skilled workers. Wildly heralded trade agreements such as the U.S.-Canadian agreement, the Common Market, and NAFTA have not dominated our wages and employment in the ways their advocates or opponents forecast.

In the past, other factors have been more important than trade in the well-being of the less skilled: technological changes that occur independent of trade; unexpected political developments, such as German reunification and instability in various regions of the world; policies to educate and train workers; union activities; the compensation policies of firms; and welfare state and related social policies. In the future, I expect that these factors will continue to be more important. I could, of course, be utterly wrong. The best we can do is probe and poke at the evidence and arguments, and present our analyses and prognostications with appropriate humility.

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