

An hourglass-shaped graphic with a globe inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is centered in the narrow neck of the hourglass. The text is overlaid on the hourglass.

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February 2, 2009

Congressional Research Service

Report 98-742

*TRADE WITH DEVELOPING COUNTRIES: EFFECTS  
ON U.S. WORKERS*

J.F. Hornbeck, Economics Division

Updated September 2, 1998

**Abstract.** U.S. trade patterns are continuing to change, revealing the likely irreversible drift toward global economic integration. Expanding trade with developing countries is one of the more troubling "globalization" issues because many fear that it leads to lost jobs or reduced incomes for the U.S. labor force, particularly unskilled workers. This report provides a summary of the major trends in U.S. trade with developing countries, the foundations of trade theory, a discussion of the empirical literature on employment and wage effects, and a summary of policy options.

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# CRS Report for Congress

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## Trade with Developing Countries: Effects on U.S. Workers

September 2, 1998

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### ABSTRACT

U.S. trade patterns are continuing to change, revealing the likely irreversible drift toward global economic integration. Expanding trade with developing countries is one of the more troubling “globalization” issues because many fear that it leads to lost jobs or reduced incomes for the U.S. labor force, particularly unskilled workers. This report provides a short summary of the major trends in U.S. trade with developing countries, the foundations of trade theory, a discussion of the empirical literature on employment and wage effects, and a summary of policy options. For related CRS reports see, *Trade with Developing Countries: Trends and Prospects* (98-741 E) and *Maquiladoras and NAFTA: The Economics of U.S.-Mexico Production Sharing and Trade* (98-66 E). This report will not be updated.

# Trade with Developing Countries: Effects on U.S. Workers

## Summary

Growth in U.S. trade with developing countries is one of the more troubling “globalization” issues and has been part of the debate over passage of fast-track authority, extension of the North American Free Trade Agreement (NAFTA), and the Africa trade bill. A central concern for many is whether this trade relationship leads to lost jobs or reduced wages for the U.S. labor force, particularly unskilled workers.

Over the past three decades, U.S. trade with developing countries has expanded markedly. From 1987 to 1997, developing-country trade rose 195% (compared to 104% for trade with developed countries), increasing its share from 36% to 45% of total U.S. trade. U.S. exports to developing countries grew by 243% compared to 135% for developed countries, and imports expanded respectively by 167% and 84%. Imports from developing countries represent only 5% of U.S. gross domestic product (GDP).

The economic implications of these trends are disturbing precisely because trade theory may be seen to support the prospect that trade with developing countries can hurt unskilled U.S. workers. Developing countries have a comparative advantage in the production of goods using unskilled labor. Accordingly, increased U.S. imports from low-wage countries may lead to a decline in demand for unskilled U.S. workers, reducing their wages and contributing to a widening of the differential between skilled and unskilled manufacturing wages. However, because many assumptions of trade theory are violated in the real world and other factors affect real wages, the effects of trade need to be examined carefully.

Economists disagree on the strength of the trade-wage inequality relationship, with estimates ranging from those that consider trade the primary problem of unskilled workers to those that see trade as virtually blameless, or overwhelmed by other factors, chiefly technological change. Most studies suggest that extreme estimates may be overstating their respective cases and that trade is only one of many factors affecting inequality. A “consensus” of estimates would put developing-country trade responsible for between 10% and 20% of the growth in wage inequality since the 1970s. Economists generally portray this as only a “modest” effect, suggesting that most of the inequality problem cannot be explained by trade.

Although economists disagree on the effects of trade, they tend to agree on trade policy, arguing that protectionist policies do little to help unskilled workers and come at a very high price to the rest of the economy. Alternatives involve helping unskilled workers adjust to trade by upgrading their skill levels, helping them transition to higher quality jobs, or perhaps providing some type of transitional income assistance or insurance. In short, whether one is inclined to accept the worst case scenario on the effects of developing-country trade on the United States, or dismiss it entirely in favor of technological change as the greatest threat to the American Dream, the consensus solution among economists lies with making the work force as competitive as possible in the global economy.

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# Trade with Developing Countries: Effects on U.S. Workers

U.S. trade patterns are continuing to change, revealing the likely irreversible drift toward global economic integration. Expanding trade with developing countries is one of the more troubling “globalization” issues; many fear that it leads to lost jobs or reduced incomes for the U.S. labor force, particularly unskilled workers.<sup>1</sup> Uncertainties such as these are fully evident in the congressional debate over how to proceed with fast-track authority and other trade policy legislation. One perspective embraces freer trade as promoting productivity, economic growth, and higher standards of living. Another argues that even if true, trade does little to address (and may even compound) problems of economic inequality, which should also be an integral concern of U.S. trade policy.

This report focuses on changing U.S. trade relationships over the past decade, concentrating on the growing importance of developing country trade and particularly its effects on U.S. workers. Following a short summary of major trends in U.S. trade and the foundations of trade theory, the empirical literature on employment and wage effects is evaluated, as are policy options.

## Patterns of U.S. Trade with Developing Countries<sup>2</sup>

Trade with developing countries has grown briskly over the past decade (see **table 1**). Since 1987, total U.S. merchandise trade with developing countries rose from \$237 billion to \$698 billion, or 195% compared to 104% for such trade with developed countries. U.S. exports to developing countries increased by 243% compared to 135% for developed countries and imports grew by 167% compared to 84%, respectively.

These trends point to shifting patterns of U.S. trade. In 1987, developing country trade made up 36% of total U.S. merchandise trade and 40% of the trade deficit. By 1997, developing country trade was 45% of total U.S. merchandise trade and 55% of the trade deficit. Although this represents significant growth, total imports from developing countries amounted to only 5% of U.S. gross domestic product (GDP), an important point to bear in mind as the effects of trade with developing countries are discussed. World imports were 12% of GDP in 1997.

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<sup>1</sup>The U.S. Department of Commerce, *Foreign Trade Highlights*, defines U.S. developed country trading partners as Canada, Japan, Australia, New Zealand, the Republic of South Africa, and all Western European countries. All others are developing countries.

<sup>2</sup>For a more detailed discussion on patterns of U.S. trade, see: CRS Report 98-741 E, *Trade with Developing Countries: Trends and Prospects*, by J. F. Hornbeck, 9 p.

**Table 1. U.S. Merchandise Trade, 1987 and 1997**  
(\$ billions)

Region	1987				1997			
	U.S. Exports	U.S. Imports	Trade Balance	Total Trade	U.S. Exports	U.S. Imports	Trade Balance	Total Trade
Developing Countries	87.4	149.3	-61.9	236.7	299.4	398.8	-99.4	698.2
Developed Countries	165.4	256.6	-91.2	422.0	388.2	471.1	-82.9	859.3
World Total	252.8	405.9	-153.1	658.7	687.6	869.9	-182.3	1,557.5
Developing Countries as % of Total	34.6	36.8	40.4	35.9	43.5	45.8	54.5	44.8

**Source:** Table prepared by CRS based on data from the U.S. Department of Commerce.

Although this trade growth was encouraged by the evolving post-war trading environment (the General Agreement on Tariffs and Trade (GATT) and other trade liberalization efforts), changing investment and production patterns also explain much of the increased trade volume between the United States and developing countries. Hence, it is not only the size of trade with developing countries that raises policy issues, but also the effects of changing U.S. economic relationships related to this trade.

An important aspect of trade with developing countries involves specialization below the final product level, where different countries manufacture only a portion of the whole good. Developing countries take on the relatively low-skill labor-intensive stages of the production process, with developed countries such as the United States completing the relatively high-skill and capital-intensive portion of the production process. U.S. firms have engaged in so-called production sharing for decades, the most well known arrangement being the maquiladora program in Mexico. Production sharing allows U.S. firms to send materials or intermediate goods to another country for assembly or manufacture. The resulting product is then imported back into the United States for further production or final sale.<sup>3</sup>

Lower wages provide the basis for such production differentiation and the developing country trade data presented here serve well as a proxy for trade with low-wage economies. Developing countries typically have compensation levels (wages and benefits) less than half those in the United States. For manufacturing production workers in 1996, the Asian Newly Industrialized Countries (NICs -- Hong Kong, Singapore, Taiwan, Korea), with the highest developing country wages, had compensation levels as a group equal to 39% of those in the United States. Mexican and Sri Lankan production workers, by contrast, were compensated at only 8% and

<sup>3</sup>For more on production sharing, see: United States International Trade Commission. *Production Sharing: Use of U.S. Components and Materials in Foreign Assembly Operations, 1993-1996*. USITC Publication 3077, December 1997.

3% respectively of their U.S. counterparts. These trends partially explain why, with the exception of China, the developing countries with the highest growth in total trade with the United States (Malaysia, Thailand, Mexico, Singapore) have significant production sharing arrangements with U.S. firms.<sup>4</sup>

The implications of growing U.S. trade with developing (low-wage) countries is bothersome for many because these changing economic relationships imply that as firms adjust to take advantage of specialization driven by lower costs, the U.S. economy undergoes change. Such change is at the heart of the trade policy debate because of economic implications for those firms and workers who compete directly with foreign low-wage producers and therefore bear the brunt of the adjustment process.

## Trade Theory and Its Implications

The benefits of freer trade are being embraced by an ever-widening group of countries, particularly those in the developing world.<sup>5</sup> Trade occurs because it is mutually beneficial for each trading nation and trade theory helps explain why this is so. First, in an open trading system, specialization by *comparative advantage* suggests that the gains from trade arise from countries producing what they do relatively more efficiently than other countries, and trading for those things that are produced relatively more efficiently abroad. In other words, trade comes about because countries do not produce all things equally well.<sup>6</sup>

Second, economists recognize that countries export goods that use *intensively* their most abundant “factors of production” (capital and labor) and import goods that use their scarce factors *intensively* (*Heckscher-Ohlin* theorem). This concept provides a very useful beginning to understand trade between developed and developing countries because they are endowed differently, which provides the basis for trade (e.g., the U.S. has a relative abundance of high-skilled labor compared to developing countries).

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<sup>4</sup>U.S. Department of Labor. Bureau of Labor Statistics. *International Comparisons of Hourly Compensation Costs for Production Workers in Manufacturing: Updated Data for 1996*. News Release, February 9, 1998. Table 1.

<sup>5</sup>This summary is brief; see: CRS Report 96-608 E, *Trade and Economic Well-Being*, by Craig Elwell. For a more technical exposition, consult: Appleyard, Dennis R. and Alfred J. Field, Jr. *International Economics, Second Edition*. Chicago, Richard D. Irwin, Inc., 1995. pp. 121-34. For a critique on the limitations of this theory in practice, see: Bhagwati, Jagdish and Vivek H. Dehejia. Free Trade and Wages of the Unskilled — Is Marx Striking Again? In Bhagwati, Jagdish and Marvin H. Kosters, eds. *Trade and Wages: Leveling Wages Down?* Washington, D.C., The AEI Press, 1994. pp. 42-46.

<sup>6</sup>The basis for improved economic well-being is not intuitive for many, yet most people’s economic lives are based on specialization and trade. They perform specific jobs and hire others to do things they do not have the time, inclination, or skills to do as well. This same concept applies to countries in the global economy. In addition to comparative advantage, economies of scale and product differentiation encourage countries to trade, particularly where they have similar factor endowments and production capabilities.



Third, as economies adjust to trade, producing goods that use their relatively most abundant factors of production, the prices of these *products* should tend to converge among trading countries. To the extent that this occurs, the prices of *factors* (labor, capital) needed to produce these products also tend to converge. (*Factor Price Equalization* theorem). Finally, it follows that as demand for the abundant factor (used for exports) increases with trade, so too does its price relative to the scarce factor, which in turn raises the real income of owners of the abundant factor -- income distribution moves in favor of factors used for export (*Stolper-Samuelson* theorem).

Important to the analysis of these propositions discussed in the next section is the critical and generally accepted relationship that *trade affects wages (one factor's price) indirectly through the mechanism of relative product prices rather than the volume of goods traded.*

## Implications of Trade Theory

Trade theory, it seems, does not bode well for the low-skilled worker in the United States. Developing countries have a comparative advantage in certain natural resources and low-skilled labor. With trade liberalization, they would specialize in exporting goods that use low-skilled labor intensively (because low-skilled labor is abundant and less expensive compared to capital and high-skilled labor) and import from advanced economies goods that use capital and high-skilled labor intensively (because capital and high-skilled labor are scarce and more expensive relative to low-skilled labor). Developing countries, for example, would export simple manufactures and primary products, while importing relatively more sophisticated manufactured goods.

In developing countries that trade with the United States, the demand for low-skilled manufacturing workers (their relatively abundant factor) should rise relative to the United States. It follows that wages for low-skilled manufacturing workers should rise in developing countries relative to comparably skilled workers in the United States. In other words, over time the wage gap between low-skilled workers in developing and developed countries is expected to narrow. In fact, data since 1975 suggest this is happening, with compensation rising faster (albeit from a much lower base) in nearly all developing economies than in the United States.<sup>7</sup>

Also, wage differentials should widen between low-skilled and high-skilled manufacturing workers in the United States because increased competition from imports using low-skilled workers from developing countries would cause U.S. businesses to shift production toward more profitable goods using high-skilled workers. The demand for low-skilled workers thus falls relative to the high-skilled, putting downward pressure on the former's wages. Trade theory, then, seems to support the prospect that trade with developing countries may hurt low-skilled workers in the United States, which is at the heart of the current debate.

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<sup>7</sup>U.S. Department of Labor, op. cit., p. 4.

## Trade, Employment, and Wages: Empirical Evidence

Trade theory rests on a foundation of assumptions that are not observed perfectly in the world. Empirical studies can help explain how closely theory and practice match when assumptions are relaxed.<sup>8</sup> In discussing studies that attempt to quantify the economic effects of trade, it is perhaps best to establish first that analyses of U.S. trade patterns with developing countries suggest that they do reflect, rather strongly, what would be expected from economic theory. As stated simply in one study, in trading with developing countries, the United States is “a net exporter of skill-intensive products and a large net importer of non-skill-intensive products.”<sup>9</sup>

But what does this mean for the U.S. economy? More specifically, the key questions are: 1) how has developing country trade affected U.S. employment? and; 2) is it responsible for the growth in wage inequality between low- and high-skilled workers? The answers to these questions come from vast quantities of recent research, of which a representative sample is summarized below.<sup>10</sup>

### Analyzing the Problem

Although low-wage workers have had real wage gains in recent years, it is too early to conclude that the United States is experiencing a reversal of three trends that have been in place since the early 1970s. First, the demand for manufacturing labor has fallen, particularly for unskilled workers. Second, real wages of unskilled workers have declined relative to skilled workers. Third, real wages of unskilled workers have fallen in absolute terms, reducing their standard of living.<sup>11</sup>

Real wages are largely determined by labor productivity (a function of skill levels, experience, education, and training), but of recent concern to both trade and

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<sup>8</sup>A few assumptions would be: free markets; full employment; perfect competition; no transportation costs; homogeneous factors of production; constant technology. These all affect relative factor and product prices. High unemployment, for example, can mitigate trade-related upward pressure on low-skill wages in developing countries.

<sup>9</sup>For ample empirical evidence supporting their statement, see: Sachs, Jeffrey D. and Howard J. Shatz. Trade and Jobs in U.S. Manufacturing. *Brookings Papers on Economic Activity*. No. 1. 1994. pp. 16-21. Note that this does not imply a trade deficit or surplus with a particular region or country.

<sup>10</sup>These studies vary in their use of terminology, some using unskilled, others low-skilled worker. These terms are used interchangeably in this report, although the individual studies may be analyzing somewhat different groups of workers depending on data sources. By one measure, 7% of employed persons are in low-skilled manufacturing jobs; see: CRS Report 97-764 E, *The Education/Skill Distribution of Jobs: How Is It Changing?*, p. 12, by Linda Levine. Finally, for a complete discussion (exceeding 100 pages) of the work done in the last few years on this subject, see chapter 2 in: Cline, William R. *Trade and Income Distribution*. Washington, D.C., Institute for International Economics, November 1997.

<sup>11</sup>These points are accepted without elaboration in this report. For detailed evidence supporting these widely-held claims, consult any of the literature cited herein. On the effects of trade on U.S. manufacturing, see: CRS Report 98-440 E, *Is Globalization De-Industrializing the U.S. Economy?: An Analysis*, by Craig K. Elwell.

labor economists are two specific trends suspected of affecting the work force: growth in trade with developing countries and the increased use of personal computers and other technological innovations. Most economists acknowledge that both trends may affect U.S. labor markets by increasing the demand for high-skill relative to low-skill workers. Theoretically, technological advancement leads to an increase in demand for relatively higher educated, trained, and skilled workers. Increased developing country imports made mostly by unskilled labor, by contrast, decrease the demand for unskilled labor in the United States. The question remains, to what extent can labor market trends be linked to trade (or technology or both)?

Most studies rely on one of two basic techniques to evaluate the role of trade on employment and wages. The first is factor content analysis, which seeks to determine employment effects of trade by estimating how much skilled and unskilled labor is used for producing a country's exports, and how much would be used to produce at home the goods it imports. Wage effects are then estimated based on some measure (assumed or estimated) of how sensitive wages are to changes in the supply of labor (both skilled and unskilled).<sup>12</sup>

Although widely used, factor content analysis has ardent critics who believe it is inadequate to evaluate trade's effects on wages. First and foremost, this approach does not link goods prices with factor prices (wages), which, critics argue, is an analytical must. For low-wage imports to put downward pressure on U.S. wages, the prices of low-skill-intensive goods must fall relative to high-skill-intensive goods. Product prices are ignored, however, in factor content analysis.<sup>13</sup>

Second, factor content analysis makes the assumption that wage effects logically follow employment effects. Even if the employment effects are accepted, some factor content analyses point out that wages may not move in a predictable magnitude with the employment effects. This is due in part to the fact that today only 15% of the work force is employed in manufacturing and only 2% is employed in sectors confronted with serious competition from developing country imports. Further, non-manufacturing industries that employ unskilled workers (construction, retail, fast food) may have a stronger influence than trade in setting unskilled wages economy wide. This is not to say that factor content analysis does not have its uses for illuminating the possible employment effects of trade, it just does not make the direct link to wages that is inferred, except perhaps under very stringent assumptions.<sup>14</sup>

A second method very specifically evaluates goods and factor prices to determine if the price of low-skill-intensive products has fallen relative to high-skill-

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<sup>12</sup>These estimates vary; see: Collins, Susan M. *Economic Integration and the American Worker: An Overview*. In Collins, Susan M., ed. *Imports, Exports, and the American Worker*. Washington, D.C., The Brookings Institution, 1998. pp. 26-27.

<sup>13</sup>See chapters 2 and 3 in Bhagwati and Kosters, op.cit. and Bhagwati, Jagdish. *Trade and Wages: A Malign Relationship?* In Collins, *Imports, Exports, and the American Worker*, pp. 56-60.

<sup>14</sup>Sachs and Shatz, *Trade and Jobs in U.S. Manufacturing*, pp. 33-34 and Freeman, Richard B. *Will Globalization Dominate U.S. Labor Market Outcomes*. In Collins, *Imports, Exports, and the American Worker*, pp. 115-21.

intensive products. If this is occurring, then trade with developing countries may be following the path predicted by trade theory, thereby contributing to employment and wage problems suggested by labor advocates.

This methodology is also limited in some respects. In particular, trade prices are not fully reliable in making an assessment about whether low-skill-intensive import prices have fallen relative to high-skill-intensive imports. Among many drawbacks, import price series are very incomplete and precision is lost when various products are aggregated in the trade data. There is no accounting for differences in quality of goods exported and imported, for example, or any way to assess reliably different labor skills employed.<sup>15</sup>

Keeping in mind these methodological limitations, attempts by economists to pass judgement on the employment and wage effects of trade are organized below into three categories. First, there are those who argue that evidence points to trade as the primary factor causing employment and income problems for the unskilled work force. At the other end of the spectrum are those convinced to the contrary, that trade plays virtually no role. Both of these positions may be considered minority views today. In the middle are gathered many economists who acknowledge that trade with developing countries may affect U.S. labor markets, but that it is only one of many factors and not the most important. This is, by far, the largest group.

## Trade Is the Issue

Labor advocates argue that trade with developing countries directly affects employment and income of low-skilled workers. Although much of the public policy literature relating trade to labor market problems reflects views that are, to a large degree, unsubstantiated, some in-depth research has raised to a serious level questions over the prospect that as stated by the first economist in this group “trade is the main cause of problems of the unskilled workers.”

**Wood.** Adrian Wood represents one end of the debate spectrum. Using factor content analysis, he asserts that as predicted by trade theory, in a country with “relatively few unskilled workers” compared with the rest of the world (the United States), lowering barriers to trade with developing countries will cause production to shift in favor of skill-intensive products and away from less-skill-intensive goods. This occurs because, citing textile and apparel for example, the relative price of the apparel falls with trade, lowering the demand for unskilled labor. Wood shows that in a cross-country comparison from 1970 to 1990, the fall in manufacturing employment in all developed countries is concentrated in low-skill sectors and correlates strongly with the rise in manufactured imports from developing countries.<sup>16</sup>

To test for the strength of this relationship, Wood evaluates the factor content of trade, but makes some unconventional modifications that have called into question the magnitude of his results. First, he assumes that if developed economies produced

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<sup>15</sup>Freeman, Will *Globalization Dominate U.S. Labor Market Outcomes?*, pp. 124-25.

<sup>16</sup>This discussion is taken from: Wood, Adrian. *How Trade Hurt Unskilled Workers*. *Journal of Economic Perspectives*, v. 9, Summer 1995. pp. 57-80.

at home the low-wage goods they import, they would use the amount of labor (relatively more) consistent with production in a developing economy. Second, he argues that developed economies would be more labor intensive if they did not trade with low-wage countries because such trade encourages the adoption of labor-saving technologies to an even greater extent than otherwise would be the case.

Wood, therefore, makes fairly high estimates regarding the employment effects in developed economies of liberalizing trade with developing countries. He argues that trade with developing countries has caused a 20% decline in the relative demand for unskilled labor in developed countries as an outside estimate including implied losses the service sector.<sup>17</sup> It follows that such a strong influence on relative employment would have a significant downward influence on the wages of low-skilled workers in developed economies. Many economists do not accept these assumptions and so find his estimates too high.

**Borjas, Freeman, and Katz.** This factor content analysis relies on more “conventional” assumptions, asserting that because the United States is a net importer of low-skill-intensive goods, its trade deficit in these goods amounts to indirectly increasing the supply of unskilled labor relative to skilled labor (particularly workers with less than a high school education). Making the similar point with respect to employment and wages the authors found that trade was responsible for 15-25% of the 11 percentage point increase in earnings inequality between college and high school graduates in the early 1980s.<sup>18</sup> However, in an updated version of this study, carrying the analysis forward from 1980 to 1995, the authors found trade responsible for only 5% of the effect on income inequality between high school and college graduates and slightly more (8%) of the discrepancy between high school graduates and dropouts.<sup>19</sup>

## Trade Is Not the Issue

At the other end of the debate is the position that trade has nothing to do with employment and income problems in the United States. This position is the general finding of various studies that focus on the prices of products exchanged, consistent with trade theory, as mentioned above. Trade theory, however, may not hold up if many of the necessary assumptions are relaxed (e.g. full employment, constant technology), a determination that this type of study attempts to make.

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<sup>17</sup>Ibid, pp. 61-68. Details of the methodology count. To include the possible effect on services industries, Wood simply doubles his estimate for manufacturing sectors. By his own admission, other factor content analyses arrive at much smaller estimates.

<sup>18</sup>Borjas, George J. with Richard B. Freeman and Lawrence F. Katz. On the Labor Market Effects of Immigration and Trade. In Borjas, George J. and Richard B. Freeman, eds. *Immigration and the Work Force: Economic Consequences for the United States and Source Areas*. Chicago, University of Chicago Press, 1992. p. 214. For a detailed critique, see: Cline, op. cit., pp. 76-78.

<sup>19</sup>Borjas, George J. with Richard B. Freeman and Lawrence F. Katz. How Much Do Immigration and Trade Affect Labor Market Outcomes? *Brookings Papers on Economic Activity*. No. 1. 1997. pp. 61-63, 67. The authors found immigration the more pressing problem, an issue beyond the scope of this report.

**Lawrence and Slaughter.** This study is representative of the group that strongly disputes the hypothesis that trade is a major cause of wage inequality in the United States. It argues that there is “no evidence” during the 1980s that the prices of traded goods using low-skill labor abundantly fell relative to those produced with an abundance of high-skill labor. In addition, the authors tested for evidence that technology was a critical factor in growing wage inequality by skill level. They found that “technological progress was concentrated in the skilled-labor-intensive industries,” bidding up the relative wages of skilled labor.<sup>20</sup>

Interestingly, then, this study shows that there was a relative increase in demand for skilled workers even as their relative wage increased; trade theory would predict a counterbalancing increased use of now relatively lower-priced unskilled labor. In support of their principal finding, the authors take an added step and cite other evidence that technological change has served to save less-skilled labor in the production process.<sup>21</sup> In short, this study found a relationship between growth in productivity and the use of nonproduction (high-skill) labor, which given the increase in its relative wage, is a strong indication that technology (and hence the need for high-skill labor) is the driving force in the wage inequality story, effectively overpowering any trade effects (the technology argument is summarized on page 13).

### Trade May Be the Issue

There is a growing middle ground in the economics literature analyzing both trade levels and prices that is not ready either to dismiss the effects of trade nor elevate them in looking to answer U.S. labor market questions.

**Sachs and Shatz.** This factor content study, covering the period 1978 to 1990, concludes that “the overall effect of developing country trade, a decline in employment of 5.7 percent, is divided between a drop in production (low-skill) employment of 6.2 percent and a drop in nonproduction (high-skill) employment of 4.3 percent.”<sup>22</sup> These authors agree with Wood that trade theory explains some of the labor market effects following similar logic and methodology, but in using a more “traditional” approach to factor content analysis, they come to the conclusion that Wood’s implications of a greater impact of trade on unskilled employment could not be established. Specifically, developing country trade is shown to affect low-skill employment more than high-skill employment, but the difference is small.<sup>23</sup>

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<sup>20</sup>Lawrence, Robert Z. and Matthew J. Slaughter. International Trade and American Wages in the 1980s: Giant Sucking Sound or Small Hiccup? *Brookings Papers on Economic Activity*, Microeconomics 2, 1993. pp. 165, 192-202. Also, see: Slaughter Matthew J. and Phillip Swagel. The Effect of Globalization on Wages in the Advanced Economies. In, International Monetary Fund. *Staff Studies for the World Economic Outlook*. Washington, D.C. December 1997. pp. 82-90. Bhagwati also falls squarely in this camp, see: Trade and Wages: A Malign Relationship?, op. cit.

<sup>21</sup>Lawrence and Slaughter, International Trade and American Wages, p. 204.

<sup>22</sup>Sachs and Shatz, Trade and Jobs in U.S. Manufacturing, pp. 29.

<sup>23</sup>Ibid. pp. 32-33.

Sachs and Shatz verified their factor content analysis with price data, finding that, “the prices of non-skill-intensive goods fell in relative terms...consistent with the rise in low-wage trade competition,” but that the magnitude of the price change was not sufficient “to account for a significant widening of wage inequalities.”<sup>24</sup> This conclusion points to the difficulty in attempting to explain economy-wide effects based on select sectoral analysis, suggesting that there are more forces at work to explain the wage discrepancy issue. The authors assert that a *combination* of technical change and trade-related effects would explain much of the change in relative demand for skilled workers, as well as, the growing wage gap.<sup>25</sup>

This study has come under criticism for excluding computer prices in its trade sample because relative prices fell dramatically, reflecting huge gains in productivity that would “overwhelm” the rest of the data. With computer prices, the data would not point to an increase in the relative price of high-skill-intensive goods, and so not provide the evidence that trade may have played a role in the wage disparity issue. Many critics do not accept dropping computers from the sample and further argue even if done, the result is still statistically insignificant to condemn trade.<sup>26</sup>

**Krugman.** Opting for a different methodology, but again looking at the volume of trade, Paul Krugman argues that developing country trade has had only a small effect at most on labor market problems in the developed world. He develops a computable general equilibrium model to explore how “wages and employment in the advanced countries and trade with the third world might be simultaneously determined.”<sup>27</sup> The general equilibrium approach explores the effects of one variable on the economy, as a whole, defining relationships across different markets, say the tradeable goods market and the employment market.

Krugman’s model suggests that trade growth between developing and developed countries is consistent with a 3% rise in the relative wages between skilled and unskilled workers in the United States since the early 1970s (10% of the 30% increase). The effect is no larger because the trade volume is too small relative to the U.S. economy. Further, the effects of the factor-price-equalization theorem (wages converging between low- and high-wage economies) break down with complete production specialization because, effectively, workers are not manufacturing the same goods and so not truly competing with each other across borders.

Krugman concludes that wages of developed country workers are, therefore, not seriously threatened by developing country trade. He uses the notebook computer as a case in point, suggesting that although the computer appears to be a high-

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<sup>24</sup>Ibid, pp. 38-40.

<sup>25</sup>Ibid, p. 41. Italics are the author’s.

<sup>26</sup>This study was updated in 1997, including adding data on trade in computers. The article, however, was subject to a host of new criticisms. See: Sachs, Jeffrey D. and Howard J. Shatz. *International Trade and Wage Inequality in the United States: Some New Results*. In Collins, *Imports, Exports, and the American Worker*, pp. 215-56. One of the most vehement critics is Bhagwati, *Trade and Wages: A Malign Relationship*, pp. 59-60.

<sup>27</sup>Krugman, Paul. *Growing World Trade: Causes and Consequences*. *Brookings Papers on Economic Activity*. No. 1. 1995. p. 344.

technology good with U.S. microprocessors and Japanese flat-panel displays, it also contains simple wiring and plastic shells that fall easily into a developing country niche.<sup>28</sup>

**Leamer.** Edward Leamer is critical of labor economists' approach to analyzing the factor content and quantity of trade for having no solid link to economic theory. He does, however, suggest that they are correct in looking to "globalization" as one reason for the relative decline in unskilled wages. He does this by also critiquing the work of his colleagues on the international economic side, suggesting they have not properly assessed the problem.<sup>29</sup>

Leamer argues that product prices, focusing in particular on data from the apparel and textile industries, have moved in the direction that is consistent with an increase in income inequality in the United States. This trend occurs, however, *only for the 1970s*, when prices of apparel fell by 30% as employment and wages in the industry moved in tandem. In the 1960s, prices, employment, and wages of all income groups rose and in the 1980s the free fall in apparel and textile prices ceased, consistent with other studies finding that trade was not a factor in the growth of the wage differential. His assessment is that the 1970s were the "Stolper-Samuelson decade" where wage inequality is linked with the rise of low-wage imports; other economists find otherwise because they focused only on the 1980s. Leamer suggests, however, that technology was likely the more important factor affecting wages in the 1980s, but that the issue remains "unresolved."<sup>30</sup>

Leamer's work has attracted critics as well, many focused on the strict technical limitations of his model. In addition, broad concerns have been raised regarding facts not addressed in his story. For example, the fall in real wages during the 1970s also coincided with an overall decline in productivity as the U.S. economy weathered oil shocks, inflation, and unemployment. Energy prices and unemployment may well have influenced real compensation in the work force, particularly in textiles and apparel.<sup>31</sup>

## Summary and Conclusions

Trade with developing countries is growing, flagging a central concern in the trade policy debate: has this growth materially affected the wages of unskilled workers in the United States? Although economists differ in their responses, a "consensus" of estimates would put developing country trade responsible for between

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<sup>28</sup>Ibid, p. 336, 358-60; see: ITC, op. cit., p. 2-22 for same point on semiconductors.

<sup>29</sup>Leamer, Edward E. In Search of Stolper-Samuelson Linkages Between International Trade and Lower Wages. In Collins, *Imports, Exports, and the American Worker*, pp. 147 and 168.

<sup>30</sup>Ibid, p. 163-76, 191 and Leamer, Edward E. *Foreigners and Robots: Assistants to Some, Competitors of Others*. Paper presented at the Conference on Social Dimensions of U.S. Trade Policies. Congressional Research Service, Library of Congress. April 16, 1998. p. 13.

<sup>31</sup>See: Comment by Gene M Grossman. In Collins, *Imports, Exports, and the American Worker*, p. 209.



10% and 20% of the growth in wage inequality since the 1970s (see **table 2**). Most consider this a “modest” effect, suggesting that the bulk of the problem cannot be explained by trade.

**Table 2. Estimates of the Effect of Developing Country Trade on U.S. Wage Gap Between “Skilled” and “Unskilled” Workers**

Study	Portion of Wage Gap Due to Trade (in % where specified)
Wood (1995)	20% decline in demand for unskilled labor explains most of the wage gap.
Borjas, Freeman, Katz (1992)	15-25% (high school/college)
Borjas, Freeman, Katz (1997)	5% (high school/college) 8% (high school dropout/graduate)
Leamer (1998)	1970s - most; 1980s - little
Sachs and Shatz (1994)	5.7% decline in production (low-skill) jobs had small effect on wages.
Krugman (1995)	10%
Lawrence and Slaughter (1993)	None
Bhagwati (1998)	None
“Consensus”*	
- Cline (1997)	10% - 15%
- Collins (1998)	5% - 11%
- Mishel (1998)	10% - 25%
- IMF(World Economic Outlook (5/97)	10% - 20%

\* Consensus estimates reflect selected author’s summary judgements on the body of literature. Mishel appears in Collins, *Imports, Exports, and the American Worker*, p. 465.

**Source:** various studies. Table concept adapted from Cline, *Trade and Income Distribution*, pp. 140-143.

A second question remains: why do these estimates not find a greater role for trade given that economic theory might suggest otherwise? There are multiple possible answers to this question.

1. Trade is only one of many factors affecting wage inequality including: productivity; rates of investment in capital and labor (education); technology; immigration; demographic trends; and effective bargaining power of unions.
2. Imports from low-wage countries compete with goods made by only 2% of the U.S. work force, suggesting that their economy-wide effect on wages is small. In addition, losses of low-skill manufacturing jobs may be offset by gains in low-skill services jobs, where the largest portion of unskilled jobs reside.

3. Factor Price Equalization breaks down when worker productivity or production technologies differ across countries, leading to production specialization. In effect, the United States no longer competes in low-skill-intensive goods, but specializes in high-skill, capital-intensive products, with links through trade and production sharing.
4. Protectionism in certain import-sensitive sectors (textiles and the Multi-Fiber Arrangement) may be keeping the full effect of imports on wages from being felt. This is a research area in need of elaboration.

As a separate argument, some or all of the negative wage effects of trade may be offset by real income gains from cheaper imports. Lower priced imports (e.g. apparel) increase the purchasing power of consumers, particularly low-income consumers, who often are the ones also adversely affected by trade. In these cases, the two effects need to be considered to assess correctly the net effect of trade.

As a closing point, if the “consensus” estimate range on the wage impact of developing country trade is accepted, then some 80-90% of the issue remains unexplained. The common response to this conclusion is that the major problem of low-wage workers arises because their skills no longer match the production needs brought about by technological change. Critics of this response point out that technology’s effect on the economy cannot be measured directly in statistical studies and so often is only assumed to be a residual effect to the extent other factors are accounted for. This measurement problem remains an area of ongoing research for the time being.<sup>32</sup>

## Policy Implications

Congress has been concerned about trade legislation in part because of concern over trade’s effects on low-skilled workers. Even if the consensus is correct and trade accounts for only a “modest” portion of wage inequality in the United States, it is widely argued that helping the “few” hurt by trade is the socially responsible action to take, given that the economy as a whole may be better off with freer trade. Crafting effective policy responses has been difficult because there is no single, easily identifiable quick fix to the predicament of low-skilled workers.

One option is to support measures that restrict imports. The rationale is that if competition from developing countries lowers the real wages of some U.S. workers, minimize this competition. Interestingly, although labor groups tend to support this position, manifested essentially by resisting efforts to expand free trade agreements, few economists agree. This extends even to those who believe that developing country trade is a serious problem, such as Adrian Wood. Their reasoning is that trade restrictions have high economy-wide costs in terms of consumer choice and prices, producer input prices, and overall efficiency.

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<sup>32</sup>For a detailed critique, see: Mishel, Lawrence with Jared Bernstein, and John Schmitt. *The State of Working America, 1996-97*. Washington, D.C., Economic Policy Institute, 1997. pp. 214-26.

A second alternative, which has been in place for over 30 years, is to include trade adjustment assistance (TAA) as part of any trade liberalizing legislation. TAA has historically included both cash payments to compensate unemployed individuals who have had their incomes directly reduced because of trade, and retraining to help these displaced workers prepare for jobs currently in demand. Since its inception in 1962, however, TAA has been criticized for being ineffective and costly. Job retraining has helped only a fraction of affected workers and the program itself can delay benefits while workers go through the process of being certified.<sup>33</sup>

A recurring policy option within the TAA framework is to offer some type of short-term earnings subsidy or insurance.<sup>34</sup> This would encourage workers to take new jobs more quickly, even if the new jobs pay less than those lost, by providing supplemental income for a stated period of time. Some view this as the best way to provide more complete compensation to those most hurt by trade, but as an income transfer entitlement program it is also the high-cost option, which has limited its appeal in the past. The debate continues over how to implement the most efficient and effective policy response.

As the debate on fast track and other trade issues heats up again, the downside of trade liberalization will be discussed, as will options to minimize it. If history is any guide, one response likely to be considered will be whether or how to compensate losers by enhancing or expanding TAA. Regardless of how this facet of the debate is resolved, it also seems clear that whether one is inclined to accept the worst case scenario on the effects of developing country trade on the United States, or dismiss it entirely in favor of technological change as the greatest threat to the American Dream, the consensus solution among economists lies with making the work force as competitive as possible.

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<sup>33</sup>For more background see: CRS Issue Brief 98023, *Trade Adjustment Assistance: Proposals for Renewal and Reform*, by James R. Storey and CRS Report 98-783 E, *Trade Adjustment Assistance for Firms: Economic and Policy Issues*, by J. F. Hornbeck. For other useful programs not specifically targeted at the trade-affected worker; see: CRS Report 94-862 EPW, *The Job Training Partnership Act: A Compendium of Programs*, by Molly R. Forman and Ann M. Lordeman and CRS Report 97-536 EPW, *Job Training Reform: Legislation in the 105<sup>th</sup> Congress*, by Ann Lordeman.

<sup>34</sup>This is not a new concept, but a detailed analysis is beyond the scope of this report. See: Lawrence, Robert Z. and Robert E. Litan. *Saving Free Trade: A Pragmatic Approach*. Washington, D.C., the Brookings Institution, 1986 and for an updated version, Jacobson, Louis. Compensation Programs. In Collins, *Imports, Exports, and the American Worker*, pp. 514-16.