

FRBSF WEEKLY LETTER

Number 94-40, November 18, 1994

International Trade and U.S. Labor Market Trends

During the last 20 years, wage growth has stagnated and family incomes have diverged. The slowdown in wage growth is illustrated in Figure 1. From 1948 to 1973, real hourly wages grew on average by about 2 percent per year. By 1973 the average real wage had risen to \$8.55 (measured in 1982 dollars). Since then the average real wage has actually *declined*, so that by 1992 average real hourly earnings had fallen to \$7.42 (again measured in 1982 dollars). Even if we consider a broader measure of compensation that includes nonwage fringe benefits, like employer-provided medical insurance, it is clear that wage growth slowed dramatically after the mid-1970s.

As if this weren't bad enough, the slowdown in wage growth has been accompanied by growing inequality. Figure 2 portrays the varying fortunes of different segments of the U.S. income distribution. The shaded bars show the rapid, broad-based growth that occurred in the 1950s and 1960s. If anything, incomes of poorer households grew more rapidly than incomes of wealthier households. This trend toward greater equality came to an end in the 1970s. The stair-stepped pattern of the unshaded bars shows that during the past twenty years, and particularly during the 1980s, family incomes diverged. Households in the bottom 40 percent of the income distribution actually saw their real incomes decline, while those in the top 40 percent experienced a mild increase in income. Those who fell in the middle 20 percent saw their real income remain essentially frozen at its 1973 level.

Many explanations have been offered for these disappointing developments, ranging from the sociological to the political. However, one explanation in particular has been receiving widespread attention recently—namely, that the declining fortunes of U.S. workers are somehow related to the increasing 'globalization' of the U.S. economy. The argument does have an air of superficial plausibility to it, in the sense that declining wages and growing inequality occurred at roughly the same time that international trade grew in importance. For example, in 1973

Figure 1
Real Hourly Compensation and Wages

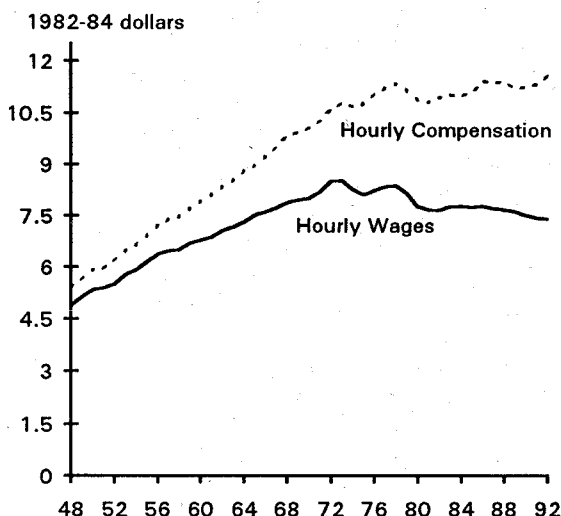
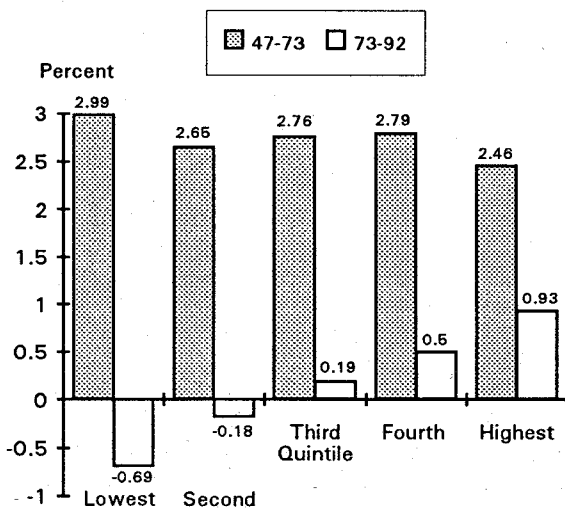


Figure 2
Average Annual Growth of Mean Family Income by Income Quintile



FRBSF

imports and exports comprised only about 6 percent of GNP. By 1993, however, the share of imports and exports had approximately doubled—to about 12 percent. While the timing of these events is suggestive, one must remember that correlation does not necessarily imply causation. In fact, recent work by Lawrence and Slaughter (1993) argues that international trade had only a peripheral role to play in these domestic labor market developments. This *Letter* will survey these arguments.

Does international trade explain the decline in average real wages?

According to Lawrence and Slaughter, the answer to this question is no. They base their conclusion on the following three-step argument. First, they demonstrate that once the proper price deflator is used, real wage growth equaled productivity growth during the past twenty years. That is, workers were paid for what they produced, so that declining wages were not the result of a shift in labor's share of income toward capital owners or toward foreigners. Thus, to explain the stagnation in wages we must explain the slowdown in productivity.

The second step of Lawrence and Slaughter's argument is to demonstrate that most of the productivity slowdown occurred in the service sector. Specifically, between 1979 and 1990 output per hour in manufacturing grew by 30.7 percent, measured in 1987 dollars. This is quite close to the historical average. However, during the same period nonmanufacturing labor productivity grew by a mere 4.5 percent. Thus, the dismal performance in nonmanufacturing productivity is the primary cause of the slump in aggregate productivity growth, and therefore in real wage growth.

Of course, this does not rule out the possibility that international trade is the culprit behind slow wage growth because international trade could have induced a shift out of manufacturing and into services. Therefore, the final step in Lawrence and Slaughter's argument is to discredit the idea that international trade has led to a 'hollowing-out' of the U.S. manufacturing base. First, the relative decline of manufacturing has been occurring for a long time, and has taken place in all OECD economies. In fact, they claim that manufacturing has declined *because* it has been relatively productive. Just as in the earlier decline of agriculture, mechanization has enabled industrial economies to satisfy their (income inelastic) demands for manufactured goods with fewer and fewer factory hands. Second, as an empirical

matter the argument that international trade caused a massive shift out of manufacturing just doesn't hold water. Even if you adopt the extreme assumption that each dollar of manufactured imports displaces a dollar of domestic manufactures, it is not possible to attribute the magnitude of the productivity slowdown to the U.S. trade deficit in manufacturing. For example, in 1991 the U.S. trade deficit in manufacturing was \$47 billion, or about 5 percent of manufacturing value-added. Increasing the manufacturing sector by 5 percent, however, would have increased aggregate productivity growth by only 0.3 percent.

Does international trade explain the increase in inequality?

The trend toward greater inequality has been driven by a growing discrepancy between the earnings of skilled and unskilled labor. For example, between 1979 and 1988 the ratio of the average wage of a college graduate to the average wage of a high school graduate rose by 15 percent. The divergence was even greater for the relatively inexperienced. In 1979 the hourly wage of a college graduate with fewer than five years work experience was 30 percent more than the wage of a high school graduate with similar experience. By 1989 this premium had soared to 74 percent. To attribute the increase in inequality to international trade, we therefore have to explain how international trade could lead to a divergence between skilled and unskilled wages.

Here the argument seems more compelling. According to traditional trade theory, a nation exports goods that use its relatively abundant factors intensively, and imports goods that use its relatively scarce factors intensively. In a sense, trading commodities that embody factors in different proportions allows nations to indirectly trade the factor services themselves. (This theory is known as the Heckscher-Ohlin model.) Given the United States' relative abundance of skilled labor, this theory predicts that the U.S. should export products that make relatively heavy use of skilled labor, while it imports products that make relatively heavy use of unskilled labor.

Because trade in commodities is just an indirect way of trading the underlying factor services, international trade tends to raise the real incomes of owners of a nation's abundant factors and depress the real incomes of those who own its scarce factors. (This result is known as the Stolper-Samuelson Theorem.) For example, from the perspective of an unskilled U.S. worker it makes little difference whether his wages are driven down directly via relaxed immigration laws that let in more people from low-wage countries, or whether his wages are driven down indirectly via the importation of commodities that make heavy use of unskilled labor.

Notice how the Stolper-Samuelson Theorem predicts that international trade causes an increase in income inequality (at least in the United States, where skilled labor is relatively abundant). Skilled workers—who are already in the upper end of the income distribution—find their incomes increasing as exports expand, while unskilled workers are forced into accepting even lower wages in order to compete with imports.

To evaluate the empirical significance of the Stolper-Samuelson Theorem, Lawrence and Slaughter examine two pieces of evidence. First, the mechanism through which the Stolper-Samuelson Theorem works is a change in relative prices. Price changes provide the incentives for resources to shift between sectors. Those industries with rising prices try to expand and those with falling prices are forced to contract. However, because industries use factors in different proportions, a change in the composition of domestic output will produce an excess demand for the factors used intensively in the expanding sectors, and an excess supply of the factors used intensively in the contracting sectors. This is the basic, underlying reason why international trade affects the distribution of income.

Unfortunately, after studying price developments in dozens of U.S. manufacturing industries during the 1980s, Lawrence and Slaughter found little evidence that prices of goods that make heavy use of skilled labor increased relative to the prices of goods that make heavy use of unskilled labor. This casts doubt on the applicability of the Stolper-Samuelson Theorem.

A second piece of doubtful evidence on the applicability of the Stolper-Samuelson Theorem concerns the relative use of skilled and unskilled labor in production. If in fact wages of skilled labor were bid up at the expense of unskilled labor due to a shift in production toward skilled labor-intensive industries, we should observe that *all* industries increased their relative use of unskilled labor. This is because as skilled labor becomes relatively more expensive, producers should economize on its use by shifting toward a more unskilled labor-intensive mode of production. Again, Lawrence and Slaughter found no evidence that such a shift has taken place. If anything, U.S. manufacturing industries have increased their relative use of skilled labor.

So what is the explanation?

Lawrence and Slaughter conclude that technological change is the most likely source of growing wage inequality in the U.S. In particular, they argue that the fears of 19th century workers—that they would be replaced by machines—is probably closer to the truth than is the Stolper-Samuelson Theorem. They point to various technological changes that have put a premium on skilled labor, the most obvious such change being the 'computer revolution' of the late '70s and early '80s.

Related changes have occurred in multimedia and telecommunications. As discussed in a prophetic article by Sherwin Rosen (1981), these advances are producing a 'superstar' economy, in which rewards are based on a winner-take-all competition. Nowadays the best singer, violinist, athlete, or whatever, can market their talents to a vast audience at very low cost. Additional support for this phenomenon comes from evidence that earnings inequality has become greater *within* professions, so that growing inequality has something of a 'fractal' quality about it.

Perhaps the most evocative image of this sort of labor market has been attributed to economist Avinash Dixit. Dixit has suggested that technological change is turning industrial nations into "Sierra Madre economies," a phrase borrowed from the classic Humphrey Bogart film *The Treasure of the Sierra Madre*. In this film an old prospector explains why those who discover gold be come so rich—"It's because they collect the wages of all those who set out to find gold but don't!"

Whether these developments are good or bad is unclear. Certainly, the popularity of state lotteries suggests that people value ('excessively') minuscule possibilities of striking it rich. If the same trade-offs are presented in the labor market, is this such a bad thing?

Kenneth Kasa
Economist

References

- Lawrence, Robert Z., and Matthew Slaughter. 1993. "International Trade and American Wages in the 1980s: Giant Sucking Sound or Small Hiccup?" *Brookings Papers on Economic Activity*.
- Rosen, Sherwin. 1981. "The Economics of Superstars." *American Economic Review* 71, pp. 845-858.

Research Department Federal Reserve Bank of San Francisco

P.O. Box 7702
San Francisco, CA 94120

Printed on recycled paper
with soybean inks. 

Index to Recent Issues of *FRBSF Weekly Letter*

DATE	NUMBER	TITLE	AUTHOR
4/29	94-17	California Recession and Recovery	Cromwell
5/6	94-18	Just-In-Time Inventory Management: Has It Made a Difference?	Huh
5/13	94-19	GATS and Banking in the Pacific Basin	Moreno
5/20	94-20	The Persistence of the Prime Rate	Booth
5/27	94-21	A Market-Based Approach to CRA	Neuberger/Schmidt
6/10	94-22	Manufacturing Bias in Regional Policy	Schmidt
6/24	94-23	An "Intermountain Miracle"?	Sherwood-Call/Schmidt
7/1	94-24	Trade and Growth: Some Recent Evidence	Trehan
7/15	94-25	Should the Central Bank Be Responsible for Regional Stabilization?	Cogley/Schaan
7/22	94-26	Interstate Banking and Risk	Levonian
8/5	94-27	A Primer on Monetary Policy Part I: Goals and Instruments	Walsh
8/19	94-28	A Primer on Monetary Policy Part II: Targets and Indicators	Walsh
9/2	94-29	Linkages of National Interest Rates	Throop
9/9	94-30	Regional Income Divergence in the 1980s	Sherwood-Call
9/16	94-31	Exchange Rate Arrangements in the Pacific Basin	Glick
9/23	94-32	How Bad is the "Bad Loan Problem" in Japan?	Huh/Kim
9/30	94-33	Measuring the Cost of "Financial Repression"	Huh/Kim
10/7	94-34	The Recent Behavior of Interest Rates	Trehan
10/14	94-35	Risk-Based Capital Requirements and Loan Growth	Laderman
10/21	94-36	Growth and Government Policy: Lessons from Hong Kong and Singapore	Kasa
10/28	94-37	Bank Business Lending Bounces Back	Zimmerman
11/4	94-38	Explaining Asia's Low Inflation	Moreno
11/11	94-39	Crises in the Thrift Industry and the Cost of Mortgage Credit	Gabriel

The *FRBSF Weekly Letter* appears on an abbreviated schedule in June, July, August, and December.