

# What's to blame for the growing wage gap?

## Commentary

### *Likely suspect is technological change, although global trade also may play role*

By Timothy J. Kehoe

Although average real incomes in the United States have increased since 1980, the real wages of the less educated have fallen. In fact, the wage gap, the difference between the median real wage of college-educated workers and the median real wage of other workers, rose by 35 percent from 1980 to 1995.

What is the cause of this increase in inequality of wage income in the United States?

One possibility is the increase in trade that has occurred between the United States and developing countries such as Mexico, China and Korea. According to this explanation, workers in the United States without high levels of education find themselves competing with workers in countries in which wages are much lower.

Another possibility is the changes in technology that have occurred in the U.S. workplace, particularly the introduction of computers and robotics. According to this explanation, workers without the education and skills to utilize this technology find a sharply declining demand for their services.

Although there is some indication that the wage gap has closed over the past two years, it still is the topic of concern and of heated debate — recall the debate preceding ratification of the North American Free Trade Agreement in 1993. Politicians on the right and the left, union leaders and even some CEOs have embraced the trade explanation of wage inequality. With very few exceptions, academic economists tend to disagree with this explanation, putting almost all the blame on technological change.

### **It's in the data**

The reason economists think that trade has been, at most, of minor importance as an explanation of increased inequality lies not in their theories but in the data. Economic theory by itself says changes in trade or technology, or some combination of the two, could be responsible. To evaluate competing theories, economists use data to test predictions of the theory. While many predictions of the trade story are not supported by the data, those of the technology story are.

The theory of international trade developed by Swedish economists Eli Heckscher and Bertil Ohlin more than 60 years ago provides an appealing explanation of the increasing wage gap in terms of trade with developing countries.

A developed country such as the United States has relatively more highly educated workers than does a developing country

such as Mexico. According to the Heckscher-Ohlin theory, the United States will export to Mexico goods and services, such as telecommunications equipment and aircraft, that use the highly educated workers intensively. Mexico, on the other hand, will export to the United States goods and services, such as fruits and vegetables and automobile assembly, that use less educated workers intensively.

The exports of education-intensive goods to Mexico will drive up the output of these goods in the United States, driving up demand for highly educated workers and their wages. The imports of less-education-intensive goods from Mexico will drive down the output of these goods in the United States, driving down demand for less educated workers and their wages.

### **Disproportionate growth**

The trade explanation of inequality, though appealing in terms of theory, runs into trouble when confronted with data.

Even though U.S. trade with developing countries has increased sharply over the period 1980 to 1995, it remains tiny as a percentage of total output. In 1980, total nonoil imports from developing countries were 2.7 percent of U.S. gross domestic product; in 1995 they were 4.2 percent. The change, 1.5 percentage points, is substantially less than the average yearly increase in GDP, the total output of goods and services within a nation.

It is hard to reconcile the enormous increase in the wage gap that has occurred with this small, absolute increase in trade. Furthermore, although the increase in the wage gap and the growth in trade occurred from 1980 to 1995, the timing was different. Most of the increase in the wage gap occurred in the 1980s, while most of the growth in trade occurred in the 1990s.

There is even more direct evidence that the trade explanation does not work. The increased demand for education-intensive products in the United States, the goods the United States exports, should have driven up their prices. Economists Robert Lawrence and Matthew Slaughter have shown that during the 1980s, the prices of the goods the United States exported fell slightly compared with the prices of goods the United States imported.

Applying the Heckscher-Ohlin theory to Mexico, we would expect to have seen a shrinking wage gap. Trade should have resulted in an increase in the output of the low-education-intensive products in Mexico, driving up demand for less educated workers and their wages. Conversely, wages of highly educated workers should have fallen. In fact, however, the data show an increase in the wage gap in Mexico similar to that in the

United States. This suggests that there was a factor more important than trade pushing the wage gap in the same direction in both countries. The likely suspect: technological change.

### **Persuasive case**

Economists Lee Ohanian of the University of Minnesota and Victor Rios of the Federal Reserve Bank of Minneapolis have provided a convincing explanation of technology as the cause of increased inequality that works in terms of the theory and the data.

A sharp decline in equipment prices in the 1980s, due largely to the fall in computer prices, led to an increase in demand for highly educated workers, who were complements for this equipment in the production process, and a decline in the demand for less educated workers, who were substitutes. Furthermore, this explanation is compatible with the decline in the price of high-tech goods and the increase in the wage gap in Mexico. Put simply, the most significant competition less educated workers in the United States face is not foreign workers but the combination of high-tech equipment and educated workers in the United States.

The trade-vs.-technology debate is not fully resolved among economists. A few economists, most notably Edward Leamer of

the University of California, Los Angeles, and Adrian Wood of the University of Sussex in England, argue that, by using different assumptions and by looking at different data, it is possible to find a larger effect of trade on income inequality. They do not, however, disagree that technology has played an important role.

It is the responsibility of economists to do better research to quantify the effect of changes in trade patterns and technology on wages. The inability of economists to convince the public on this issue probably has little to do with the technicalities of the debate, with Leamer and Wood on one side and most international trade and labor economists on the other, however. Politicians and interest groups that favor protection and journalists who want to present a "balanced" view continually are seeking someone to provide an answer different from that given by the overwhelming majority of economists. We economists need to do a better job explaining our work to the public.

Politicians and voters also have a duty to educate themselves. It is all too easy to blame the serious problems the United States and its economy face on foreigners, and poor foreigners at that.

## Median wage gap widens

Is a rising wave of imports to blame for the growing gap in incomes in the United States? Probably not.

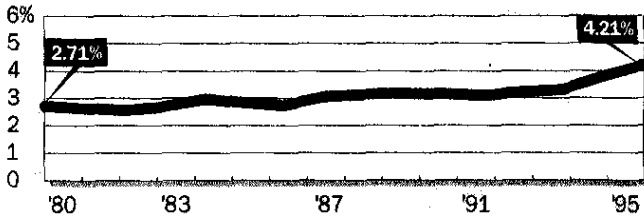
Imports have been rising since 1980 but still represent less than 5 percent of all goods and services produced by Americans. To many economists, that's too small a share of economic activity to explain the widening disparity in incomes. Instead, a growing skills gap may take the blame. The difference between the median earnings of college-educated and high school-educated workers has climbed at a faster pace than imports.

➤ **The wage gap: percentage difference in college/high school median earnings for male full-time, full-year workers, 1980-95**



Source: "Economic Report of the President," 1997

➤ **U.S. non-oil imports from developing countries as a percentage of the gross domestic product (GDP), 1980-95**



Source: International Monetary Fund, "Direction of Trade Statistics" and "International Financial Statistics," various issues.



### Timothy J. Kehoe

- **Born:** Albuquerque, N.M., June 13, 1953
- **Family:** Wife, Jean M. O'Brien; no children
- **Home:** Minneapolis
- **Education:** B.A. economics and mathematics, Providence College, 1975; M.A. and Ph.D. in economics, Yale University, 1977, 1979.
- **Career:** Assistant professor, Wesleyan University, 1978-80; assistant professor and associate professor of economics, Massachusetts Institute of Technology, 1980-84; university lecturer, faculty of economics and politics, University of Cambridge, England, 1984-87; professor of economics, University of Minnesota, 1987-present.
- **Hobbies:** Reading, traveling, entertaining

*The board responds . . .*

# With all its benefits, technology can harm workers left behind

*Economists debate the responsibility to those displaced*

By Mike Meyers  
Star Tribune National  
Economics Correspondent

Jeanne Boeh's father lost his job at a textile firm at the age of 62. He never worked again. His company, and others like it, had been pelted by foreign competition.

Yet Boeh, an Augsburg College economist, would not bar the imports that cost her father his job any more than she'd try to stop the technological change that shoved makers of ink wells and carbon paper onto unemployment lines.

"Overall, the world's welfare increased tremendously as a result of the Industrial Revolution," Boeh said. In other words, the number of winners has far exceeded the number of losers.

That's not to say Boeh or other economists don't fret about those who end up at the back of the line in reaping the rewards of capitalism.

"We have to agree that some people are hurt, but that doesn't mean we stop trade or call a halt to advances in technology," Boeh said.

She and other members of the Star Tribune Board of Economists contend that the growing income disparities in the United States since 1980 are more often the result of changing technology than of a surge of imports.

Boeh, striking a theme echoed by others on the panel, said the role of government is to provide the skills training and other aid needed to help dislocated workers land on their feet.

"Don't we have a responsibility to those who are hurt?" Boeh asked at a board discussion Friday.

## Gaps of skills, income

Her colleagues agreed that a "skills gap" has allowed educated

workers to make economic strides not achieved by those with a high school education or less.

However, disagreements did erupt over whether politicians and the news media exaggerate the degree of income disparities.

Arthur Rolnick, director of research at the Federal Reserve Bank of Minneapolis, said studies have found that wages alone are not an accurate measure of incomes. Adjusting for changes in benefits and family sizes over the past two or three decades suggests that the rich and poor alike have enjoyed economic gains, he said.

"I would argue from what I have seen of these numbers that people, on average, are living better than 20 years ago," Rolnick said.

"Some are just gaining faster than others."

One study, which examined family consumption, went so far as to say that U.S. families in the bottom 20 percent of the distribution of income have an average standard of living in the 1990s that matches that of families in the middle of the income distribution in the 1970s.

Jenny Wahl, a St. Olaf College economist, said she wasn't sure anyone should take comfort in statistics that show that income disparities in the United States haven't grown much greater than they have inside the countries of trading partners such as Mexico.

"Comparing the wage gap in Mexico to the wage gap here, are enough things held constant?" she asked. "What about taxes and the workers' level of educational attainment?"

But Tom Stinson, Minnesota state economist, said the issue of income disparities should focus on people falling below a "minimum" standard of living.

One of the most difficult questions for the economy, he said, is how to avoid creating an underclass of poorly educated people who have a slim chance of improving their economic lot in life.

In an age in which govern-

ments are under pressure not to increase taxes, improving educational opportunities won't be easy, Stinson said.

"How much can we expect private sector can do vs. public sector?" Stinson asked. "The crying need is for general, easily transferable human capital." However, companies tend to train workers for the jobs at hand.

## Those were the days

Paul Anton, chief economist at the Minneapolis consulting firm Anton & Associates, said one reason income disparities have gotten so much attention is nostalgia for a past that won't be repeated.

"We seem to think what happened in the 1950s, '60s and '70s, when everyone's absolute real wages were rising, was the normal turn of events and that this is the abnormal," Anton said.

"I would argue that at that point, we had such a relatively dominant position in the world economy that everything went up absolutely and we didn't care about the absolute shares."

These days, American know-how knows no borders and the profits associated with advancing technology and improved productivity can't be kept at home, Anton said.

He said there's little reason to debate whether those Americans left behind by change are the victims of trade or technology.

"If you had an unemployed blacksmith or an unemployed typist, they were unemployed about technology," Anton said. "If you had copper miners or textile workers who were unemployed, it was because of trade."

The right solution to those hardships is not to outlaw cars and personal computers or to keep out copper from Brazil or low-cost clothes made in China, he said.

The wise course is to give unemployed workers incentives and aid in changing their skills to match the needs of the marketplace, he said.