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Skill Differences Cause U.S. Wage Inequality

In **Changes in Relative Wages, 1963–87: Supply and Demand Factors** *(NBER Working Paper No. 3927)*, Research Associates **Lawrence Katz** and **Kevin M. Murphy** ask why college graduates, women, and older workers in the United States saw their wages increase handsomely during the 1980s relative to workers with 12 years or less of education and younger workers. They find that variations in wage differentials from 1963 to 1987 were caused primarily by steady growth in demand for more highly skilled workers.

Some of that increased demand came from faster growth in industries or occupations needing relatively greater skills, and employing more women; for example, there was a shift from low tech and basic manufacturing into professional and business services during the period. Some increasing inequality was brought about by fluctuations in the rate of growth of new college graduates. But the majority of the change was caused by increased demand for higher skills *within* specific industries or sectors of the economy.

Between 1979 and 1987, the average weekly pay of full-time workers with 8 to 11 years of schooling, adjusted for inflation and shifts in experience and the percentage of workers who were male or female, fell by 6.6 percent, while the pay of college graduates rose by 7.7 percent. Weekly earnings for men with one to five years of experience fell by 6.7 percent, but were unchanged for men with 26 to 34 years of experience. For young college graduates, weekly pay increased by about 30 percent relative to that of young high school dropouts.

To explain this increase in wage inequality, Katz and Murphy focus first on the supply of different types of workers. They calculate that the share of total hours worked by college graduates increased from 13 to 26 percent from 1963 to 1987, while the share of hours worked by high school dropouts fell from 39 percent to 13 percent. The increase in the college graduates' share, and the fall in the high school dropouts' share, was much higher during 1971–9 than during the 1960s and 1980s. Partly as a result of the unusually large increase in the supply of college graduates, their relative pay fell by over 10 percent compared to high school dropouts during the 1970s, while it rose sharply during 1963–71 and 1979–87.

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Shifts in the demand for labor among industries also contributed to changes in the wage distributions. Katz and Murphy note that jobs grew in such sectors as professional and medical services and declined in agriculture and manufacturing. They estimate that the changing pattern of jobs among industries increased the demand for college graduates by over 20 percent relative to those with no college education during 1963 to 1987.

According to Katz and Murphy, foreign trade had little effect on relative labor demand and wage rates until the large trade deficits of the 1980s. Since then, the adverse effects of trade have been concentrated on high school dropouts, especially women, who traditionally have worked on production lines in industries such as apparel and textiles that compete with imports.

Finally, Katz and Murphy examine changes in the demand for labor that took place *within* each industry. They find that increases in the demand for highly skilled labor within sectors have been larger than shifts in demand among sectors, and have been relatively steady since 1963. These increases in demand, taken together, have been large enough to offset the enormous increase in the supply of college graduates. In fact, during 1979–87, they were large enough to produce substantial increases in the relative wages of college graduates. Also, partially as a result of these changes, there was a narrowing of the male/ female wage gap of about 9 percent during 1979–87, after a 16-year period of little change in that gap.

NBER Research Associate **Alan Krueger** suggests in a related study that much of the increase in demand for highly skilled workers may have been caused by growth in the use of computers in the workplace. In **How Computers Have Changed the Wage Structure: Evidence from Microdata, 1984–89** (*NBER Working Paper No. 3858*), Krueger reports that the fraction of all workers who used computers increased from 25 to 37 percent 1984-9. For men, computer use rose from 21 to 32 percent; for women, from 29 to 43 percent.

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Even among high school dropouts, computer use increased from 5 to 8 percent; for college graduates, it rose from 42 to 59 percent. Krueger estimates that workers who use computers earn 10–15 percent more than otherwise similar workers who do not. He also finds that the increase in the use of computers explains about half of the increase in wage differentials by education during 1984–9. DRF

Uncertainty Blunts Energy Tax Credits

When energy prices increased in the 1970s, the rate of return to consumers from energy-saving investments in their homes was often more than 25 percent before taxes, and over 30 percent after federal and state tax credits and deductions were taken. Yet in any one year when these tax incentives were in place, at most 6 percent of taxpayers claimed federal tax credits for making energy-conserving investments. Over an eight-year period, less than 30 percent of taxpayers invested in energy-saving devices.

In **Energy Tax Credits and Residential Conservation Investment** (*NBER Working Paper No. 4020*), **Kevin Hassett** and **Gilbert Metcalf** find that this relatively weak response to high rates of return may have been the result of uncertainty about the future price of energy. They note that most investments in energy conservation—wall and ceiling insulation as well as storm windows and doors—are irreversible. Even when the return on these "costs" is high, it could fall sharply if future energy prices decline. Therefore, it may pay consumers to postpone such investments to see what tomorrow's energy prices will be.

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In fact, Hassett and Metcalf find that the value of waiting can be large enough to explain the low observed rates of investment in energy conservation. Using data from 1955 to 1981 on the prices of energy and conservation investments, they show that if there were no uncertainty about future prices, then 40 percent of households would make conservation improvements within five years, and 99 percent would do so within 20 years. But the price gyrations that occurred in 1955–81 meant that homeowners could not have had such knowledge. If they *had* correctly estimated this variability in prices, then the value of waiting to invest also would have increased dramatically. On net, Hassett and Metcalf show, only about 5 percent of households would invest in conservation in the first 20 years.

The authors go on to look specifically at the impact of energy tax credits on homeowners' investments in energy conservation. These credits were part of the federal tax law between 1978 and 1985. In addition, nine states offered either a tax credit or a tax deduction for energy conservation expenditures over those same years. Using this variation in the state programs, Hassett and Metcalf find that the stimulative effects of tax incentives for household energy conservation are substantially blunted by the presence of energy price uncertainty. DRH

Is Japan Creating a Yen Bloc?

As the European Community moves toward full economic integration and the United States, Canada, and Mexico negotiate a free trade area covering North America, there is growing concern that the world is breaking into economic blocs—groups of countries whose members have preferential trading and financial relationships with each other, rather than treating all countries equally. The most widely discussed potential bloc outside Europe and North America is in East Asia, where Japan has developed a highly visible economic presence. But according to NBER Research Associate **Jeffrey Frankel,** predictions of a Japan-centered Asian trading bloc are premature. While Japan appears to exert growing influence in East Asia's financial markets, Frankel finds no indications that Asian and Pacific countries are focusing their trading relationships on one another.

In **Is Japan Creating a Yen Bloc in East Asia and the Pacific?** (*NBER Working Paper No. 4050*), Frankel observes that trade within East Asia indisputably is growing rapidly. In 1989, 37 percent of the trade in East Asian countries took place with other countries in the region, 4 percentage points more than in 1980. But that figure, Frankel notes, must be evaluated against East Asia's rapid economic growth and the related growth in its total trade. Taking these factors into account, the East Asian countries actually traded slightly less with each other in 1989 or 1990 than would have been predicted based on their trade patterns ten years earlier. Intraregional trade grew more rapidly within both the European Community and the Western Hemisphere than in East Asia, holding constant overall growth rates.

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It is not a Japanese-centered Eastern bloc that shows the greatest bias toward intraregional trade, Frankel finds, but rather a trans-Pacific grouping that includes Canada and the United States. If any two countries lie within this grouping, they are likely to trade between 1 percent and 2 percent more with each other than they otherwise would. Members of the Association of Southeast Asian Nations do not trade with each other to an unusual extent, taking into account distance and the other factors, an indication that the six-nation group is not functioning as a trade bloc. And, while trade between other Asian countries and Japan increased rapidly in the second half of the 1980s, most of the increase merely reversed a decline in the early years of the decade. "There is no evidence that Japan is concentrating its trade with other Asian countries in any special way," Frankel reports. Or its ownership of foreign companies and properties, either: 15.3 percent of Japan's direct foreign investment is in East Asia, a proportion almost equivalent to East Asia's share of world trade.

When it comes to finance, however, Frankel finds signs of increasing Japanese influence. Until 1988, the Japanese financial market had a negligible effect on interest rates in most East Asian countries, primarily because most of those countries had strict controls on capital flows. Frankel observes that Japan has become the major influence on interest rates in Singapore, for example, and since 1988 has acquired an estimated influence in Korea equal to that of the United States. He also reports a gradual increase in the yen's relative importance in invoicing trade and finance in the region, and in official foreign exchange reserves.

A major reason for these developments, he adds, is that monetary authorities in several countries appear to be giving more weight to the yen in pegging the external value of their currencies. But this, he points out, is not Japan's doing. Rather, the U.S. government has pushed Japan to promote use of the yen for trade and finance outside Japan, while at the same time urging East Asian countries to open their financial markets to foreign, including Japanese, investors. "The increasing role of the yen in Pacific Asia may or may not be a good idea," Frankel writes. "But it is an idea that originated in Washington, not in Tokyo." ML

How Does Monetary Policy Affect the Economy?

While there is no doubt that the Federal Reserve affects the economy via its control of the money supply, there are alternative explanations of exactly how the transmission mechanism of monetary policy works. The traditional view is that when the Fed "tightens" by draining reserves from the banking system, the liability side of the banks' balance sheets shrinks, the stock of money falls, interest rates rise, and investment and aggregate demand are reduced. An alternative view is that monetary policy has the additional effect of reducing the overall supply of loans to certain bank borrowers. The result is a greater reduction of investment and aggregate demand through this "lending" channel than can be accounted for by the conventional "money" channel alone.

In **Monetary Policy and Credit Conditions: Evidence from the Composition of External Finance,** (*NBER Working Paper No. 4015*), **Anil Kashyap, Jeremy Stein,** and **David Wilcox** use the relative movements in bank loans and commercial paper to provide evidence of the existence of a lending channel. Suppose, the authors stipulate, that monetary policy operates solely through the money channel, and the fall in bank loans that is observed when the Fed tightens is caused only by an output-induced effect on credit demand. Then the demand for nonbank sources of credit would fall as well, leading to a reduction in the volume of commercial paper issues. But if Fed policy is operating through the lending channel and reducing the supply of bank credit, then the volume of commercial paper would increase, to the extent that businesses are able to shift between the two sources of funds.

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Kashyap, Stein, and Wilcox examine how the volume of bank loans and commercial paper outstanding has responded to changes in monetary policy since World War II. They find support for the lending channel hypothesis. Tighter monetary policy indeed leads to a shift in firms' mix of external financing: commercial paper rises while bank loans fall, suggesting that the loan supply has been reduced. Furthermore, these shifts in the financing mix seem to affect investment (even after controlling for interest rates). This implies that bank and nonbank sources of finance are not perfect substitutes for businesses—a necessary condition if monetary policy is to affect aggregate demand through a distinct lending channel.

The study also sheds new light on a statistical finding that has attracted a great deal of interest: that the spread between commercial paper rates and Treasury bill rates forecasts economic activity surprisingly well. A common interpretation is that the spread simply reflects default risk, and that this forward-looking property is what makes the paper-bill spread a powerful leading indicator. Kashyap, Stein, and Wilcox suggest instead that the spread is a proxy for the stance of monetary policy: tight monetary policy leads to an increase in commercial paper issuance, which exerts upward pressure on paper rates. The distinction may be important. The authors' theory implies that the historical correlation between the paper-bill spread and economic activity may not continue: as the commercial paper market deepens, the price pressure generated by a given Fed tightening should decline. RN

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