Labor Markets and Earnings Inequality: A Status Report

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Earnings inequality has increased dramatically in the United States over the last decade and a half. Take, for example, average weekly earnings for adults who work full-time (Figure 1). The U.S. Department of Labor (1994) has calculated that in 1979, a man at the 90th percentile of the wage distribution earned 3.2 times as much as a man at the 10th percentile. In 1992, a man at the 90th percentile earned 4.1 times as much. For women, the disparity increased from 3.1 to 3.7 over this same time period. Men at the bottom of the earnings distribution fell behind not only in relative but also in absolute terms, as average earnings for all full-time male earners fell by about 3 percent from 1979 to 1992. For women, average earnings increased by about 15 percent, so the rise in inequality was less likely to be associated with declining real earnings. While these particular calculations focus on only two points in the income distribution, the conclusion that inequality has risen markedly over the past decade and a half is supported by a large body of evidence.[1]

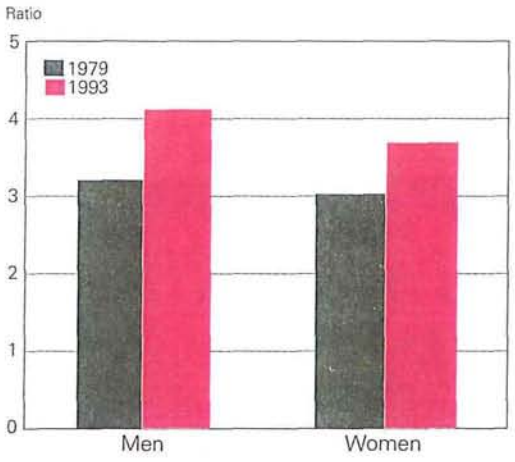
Earnings inequality has risen along various dimensions. Highly educated workers have gained relative to less educated workers. Experienced workers have earned increasingly more than inexperienced workers. And pay for similarly educated workers with similar length of experience has become more unequal. The only significant contrary trend is that the earnings of women have become more similar to those of men.[2] Recent evidence also shows that the increase in inequality during the 1980s was greater in the United States than abroad, and that the distribution of earnings here is much more dispersed than in other industrialized countries.

Much of the literature on earnings inequality was reviewed in a landmark survey by Frank Levy and Richard Murnane (1992). The current paper provides an overview of our present knowledge, concentrating for the most part on contributions since the publication of the Levy-Murnane study. It summarizes explanations for trends in inequality by educational attainment, by experience, within education-experience

Figure 1

Weekly Earnings for Full-Time Workers

Ratio of 90th Percentile to 10th Percentile



Source: U.S. Department of Labor (1994).

categories, and in general. A remarkably diverse array of economic factors (rather than a single dominant force) have caused the rise in earnings inequality in the United States. And although the rising education wage premium has received considerably more attention than the other aspects of inequality, new evidence suggests that growing inequality is traceable at least as much to other aspects of work skills.

This survey briefly examines the significance of two refinements to the measure of earnings—the role of unemployment and underemployment on the one hand, and the role of earnings variability on the other. Individuals with a low earnings capacity are increasingly likely to be out of work or working fewer hours, relative to those with a high earnings capacity. Therefore the trend toward greater earnings inequality looks more pronounced when one takes account of persons who work less than full-time or less than year-round.

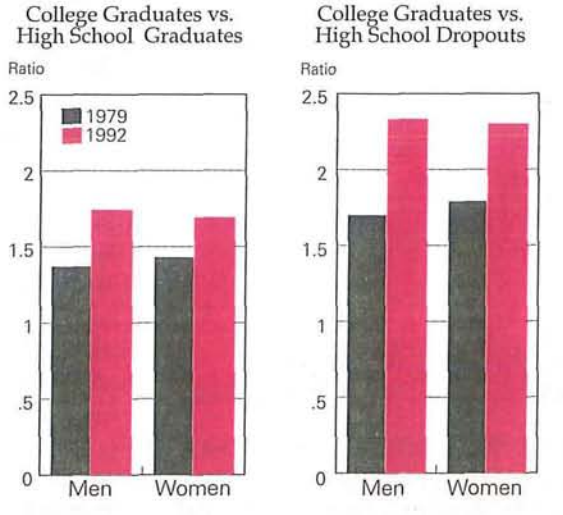
The paper assesses how additional social and political influences have interacted with labor markets in determining inequality. Changes in taxes and transfers have served to aggravate earnings disparities in the United States over the last decade and a half, as has the increased prevalence of single-parent families. The paper concludes with some observations on past and future research themes.

Changing Returns to Education

The earnings of college graduates and non-college graduates diverged sharply in the 1980s and early 1990s, after showing little relative change during the 1970s (Figure 2). According to the U.S. Department of Labor (1994), between 1979 and 1992, real earnings of full-time year-round male workers rose 5.2 percent for those with a college degree, while falling for those with less education. In 1992, male college graduates earned 74 percent more than high school graduates and 133 percent more than high school dropouts. In 1979, these differentials had been only 37 and 70 percent, respectively. The premium paid for education also rose for women during the 1980s and early 1990s, although all categories of full-time women workers except high school dropouts experienced at least some increase in real earnings. As noted in Levy and Murnane (1992), these trends have been explained by a combination of ongoing increases in demand for col-

Figure 2

Earnings Ratios by Educational Attainment



Source: U.S. Department of Labor (1994). Annual figures computed for year-round, full-time workers.

[1] For a comparison of alternative measures, see, for example, Karoly (1993).

[2] See Blau and Kahn (1994). Bradbury (1996) finds that inequality rose for men and women combined during the 1980s, despite the growing similarity in the earnings of men and women who worked full-time and year-round.

lege-educated workers and shifting rates of growth of different groups in the labor force.

The Supply of Highly Educated Workers

In the United States, the supply of college-educated workers slowed in the 1980s as compared to the 1970s, thereby helping to boost the return to higher education. This swing in the rate of increase in the number of college graduates was largely the result of demographic influences, as most of the baby boom generation came of age in the 1970s. Immigration patterns also played a role in changing the educational composition of the work force. Borjas (1995) reports that in 1990, nearly a quarter of high school dropouts in the United States were foreign-born, compared to only about one-eighth in 1980.[3]

Variation in the supply of labor also has been helpful in explaining international differences in the relative earnings of college graduates and non-college graduates. For example, slower increases in the supply of college graduates during the 1980s contributed to higher education-related earnings differentials in the United Kingdom and Japan (Katz, Loveman, and Blanchflower 1995). On the other hand, a greater expansion in the supply of college graduates in Canada helps to explain a more modest rise in educational earnings differentials, as compared with the United States.

The education of the average American worker increased from about 9 years in 1940 to about 13 years in 1990, while the returns to education increased.

An important question looking forward is whether the current large premium for college-educated workers will prompt higher college enrollments, thereby diminishing the premium in the future. A recent paper by Mincer (1994) finds that educational attainment does respond to wages, and that this response will mitigate the trend toward higher wage premia for college-educated workers. Mincer concludes, however, that the premium is not likely to fall from its current level. For one thing, the demand for college-educated labor is likely to keep rising. Moreover, "lags in the educational pipeline, growing costs [of education], and perverse demographics represent delays and impediments to timely supply effects." Mincer also notes that the recent poor performance of elementary and secondary school students, as measured by the high proportion with poor reading and mathematics skills, may represent a bottleneck for the supply adjustment. John Bishop's paper for this symposium further examines how demand and supply responses are likely to influence the wage premium for college-educated workers.

The Demand for Highly Educated Workers

Demand for more highly educated workers has been increasing for many years. The education of the average American worker increased from about 9 years in 1940 to about 13 years in 1990, while the returns to education increased (Murphy and Welch 1993c).[4] The Levy-Murnane survey noted that "there is a consensus on the importance of shifts in relative demand, and there is no shortage of potential factors to account for the demand shifts. But to date we have an incomplete picture of the relative importance of these factors." A vigorous debate on this topic continues.

Several hypotheses have emerged concerning demand shifts. The first explanation is that the mix of jobs has changed because industries such as manufacturing are a less important part of the economy than they once were, while service-producing sectors have increased in importance. Recent studies appear to be in agreement that the growing inequality between highly educated workers and others is due in part to a changing industrial structure. However, they also indicate that growing inequality is a phenomenon common to many industries, and therefore industrial mix cannot be the dominant factor in explaining trends in inequality.

[3] Immigration may also help to explain different wage trends in regions within the United States. Topel (1994) found that those parts of the country with the greatest increase in wage inequality were those with the smallest improvements in labor-force quality. In particular, he indicated that immigration of low-level Asian and Hispanic workers reduced the wages for non-immigrant workers in the West by about 10 percent. However, Topel measured labor quality according to the distribution of workers by wage categories, which would take account of other factors in addition to education levels.

[4] Murphy and Welch estimate that increases in the returns to education in the 1950s, 1960s, and 1980s more than offset decreases in the 1940s and 1970s.

A second explanation is that international trade has caused the wages of less educated workers to fall, as the United States competes with countries where wages are much lower. Although some studies have found evidence indicating that international competition is an important explanation for growing inequality, the literature on the effects of trade is particularly contentious.

A third explanation is non-neutral technological change. The argument is that American industry has invested in technologies that reduce the demand for low-end workers, while increasing the productivity (and wages) of high-end workers. This hypothesis finds support in correlations between the extent of investment in computers and other high-technology equipment by an industry, on the one hand, and the growth in inequality in its wage structure on the other. This hypothesis is appealing in that it potentially can explain earnings trends across a wide spectrum of industries.

Several hypotheses have emerged concerning the demand for more highly educated workers: a changing industrial structure, international trade, and non-neutral technological change.

The remainder of this section briefly reviews some of the recent studies of the shifting demand for highly educated workers. It divides the literature into studies of industrial mix, international competition, and technological change; studies dealing with more than one theme also are noted under these headings.

Industrial mix. Two recent studies decompose the increased demand for education into "between industry" and "within industry" effects. Murphy and Welch (1993a) find that only 19 percent of the increased demand for highly educated workers between 1968 and 1990 was due to the growing importance of industries such as professional services, finance, and education that traditionally employ a relatively high proportion of college graduates and to the shrinkage of industries such as agriculture, mining, and low- and medium-skilled manufacturing that employ a relatively low proportion. The remaining 81 percent was due to higher demand for college-educated workers among industries across the board.

Berman, Bound, and Griliches (1994) perform a similar decomposition within manufacturing and also attempt to explain the between- and within-industry shifts. They estimate that less than one-third of the shift in employment from production (that is, less educated) to nonproduction (more highly educated) workers during the 1980s can be accounted for by shifting employment across industries, and that these industrial shifts in turn are attributable largely to changes in defense-related demand and international trade. Berman, Bound, and Griliches find that the degree of shift toward nonproduction workers within industries was correlated with industry investment in computers and expenditures on research and development. The authors interpret this latter finding as indicative of the role of non-neutral technological change in causing rising inequality.

Several studies examine the role of industrial structure for middle- and lower-earners. Juhn (1994) notes that the 1980s were distinguished from the previous four decades by the contraction of industries and occupations that predominantly employ moderately educated males. Declining opportunities in the middle of the earnings distribution tended to increase the competition for low-wage jobs. In cross-state regressions, Juhn finds that the decline in the manufacturing sector had an effect on inequality precisely because that is where many moderately educated male workers have traditionally worked.

Acs and Danziger (1993) study men with earnings below a level needed to keep a family of four out of poverty. They conclude that the change in industrial structure during the 1980s had little effect on the earnings of white men in this category. Black men, on the other hand, were adversely affected by the loss of opportunities in manufacturing and in lower-paid industries. The shifts in industrial structure more than offset the benefit of higher educational attainment for black men.

Hutchens (1993) compares paths to success for 18- and 19-year-old men without a high school diploma in 1966 and 1979. He finds that the nature of jobs within certain key industries and occupations changed over time. The earlier cohort could rely on construction and clerical work to provide incomes that would keep them out of poverty; these types of jobs provided less attractive earnings for the later cohort.

Looking forward, the industrial mix of jobs is expected to continue to change. The U.S. Department of Labor projects that service-producing sectors will

account for almost all of the job growth out to the year 2005, as manufacturing and mining jobs continue to disappear and construction jobs grow only modestly (U.S. Department of Labor 1994). Whatever the effects of a changing job mix in the past, however, one recent study suggests that further changes may have only a negligible effect on earnings inequality. Schweitzer and Dupuy (1995) examine the distribution of earnings in the goods-producing and service-producing sectors for full-time workers between 1969 and 1993. They find that the earnings distributions in these two sectors have been converging since 1980 and are now quite similar.

International competition. Among the studies most forcefully setting out a substantial role for international trade are Borjas and Ramey (1994a, 1994b) and Wood (1994). Borjas and Ramey find that U.S. durable goods manufacturing industries involved in international trade traditionally have been more highly concentrated and have paid higher wages (adjusting for observable characteristics of workers) than other industries. Increased competition from imports since the early 1980s lowered the rents earned in these industries as well as the wage bill paid to workers. The decrease in employment opportunities, in turn, has forced more workers into competitive sectors, which has pushed average wages down. Borjas and Ramey examine the ratio of earnings of college graduates to less educated workers, comparing it with a list of potential explanatory variables. Using cointegration analysis for the period 1963–88, they show that the only variable that consistently shares the same long-term trend with the wage inequality series is the durable goods trade deficit as a percentage of GDP. (The level of research and development expenditures per worker appears in a graphical comparison to be correlated with wage inequality, but does not pass muster in a formal statistical test.)

Wood performs a detailed analysis of the economic effects of North-South (that is, developed country-developing country) trade. He concludes that increased trade with developing countries is the main cause of the relative shift in demand for more "skilled" (that is, educated) labor in the developed countries. He notes that not only the magnitude of the effects but also their timing supports the trade hypothesis, and that cross-country variation indicates that countries with larger increases in Southern import competition have experienced a decline in the relative position of unskilled workers.

Wood bases these conclusions on a comparison of the observed demand for labor in developed countries to what it would have been had developing countries not become the site of production for an increased share of manufactured goods consumed in developed countries.[5] He estimates that the cumulative effect of manufacturing trade patterns through 1990 was to increase the demand for skilled (educated) labor in the North, relative to unskilled labor, by 5.5 percent. But two factors omitted from the analysis could quadruple this estimate, according to Wood. First, manufacturers in developed countries have reacted to foreign competition by devising production techniques that use less unskilled labor. Second, trade has also reduced the demand for unskilled labor in service-producing sectors, both because they supply intermediate inputs to domestic manufacturers and because they participate directly in international trade.

The manufacturing sector is relatively small—less than 20 percent of U.S. employment in recent years—and only a subset of these jobs have been directly threatened by trade.

Other writers acknowledge that international competition has reduced the demand for manufacturing production workers in the United States, and that the timing of international trade patterns accords well with the rise in earnings inequality. (For example, see Sachs and Shatz 1994.) But generally they hesitate to attribute a major role to international trade in explaining trends in earnings inequality. The recent literature on this topic has been summarized in thoughtful (albeit somewhat skeptical) reviews by Burtless (1995), Fieleke (1994), and Freeman (1995).[6]

One issue is that the manufacturing sector is relatively small, accounting for less than 20 percent of U.S. employment in recent years. Only a subset

[5] Wood starts by examining the skill and labor content of the imported goods, but then modifies the estimates in light of the fact that different relative prices in developed countries would lead them to use a different mix of inputs, and because a higher price for these goods (were they produced in developed countries) would lead to a reduction in demand for them.

[6] These reviews also cover recent volumes edited by Bhagwati and Kosters (1994) and Bergstrand, Cosimano, Houck, and Sheehan (1994).

of these jobs have been directly threatened by trade. Moreover, at least some of the increase in international trade has been with developed countries with high wages, limiting the extent to which one would expect U.S. wages to adjust downward.

Second, the theory predicts that trade should change the relative output prices of low-skill and high-skill manufactured goods. That is, in the United States, we should expect to see a decline in the relative price of non-skill-intensive, import-competing goods. (In fact, it is this price decline that would cause a drop in U.S. wages.) The evidence on this prediction is mixed. Lawrence and Slaughter (1993) do not find that relative prices of goods that use production labor relatively intensively have declined in the United States. (Instead, their study tends to support the technology hypothesis, as they find that total factor productivity—their proxy for technology—rose more rapidly in industries that used nonproduction workers more intensively.) On the other hand, Sachs and Shatz (1994) use an alternative price series to show support for the trade theory.

Another issue concerns trends in other industries. The release of manufacturing production workers to other sectors should not only have lowered the earnings of other, relatively less educated workers (as it did), but also caused other sectors to increase their use of such workers. Instead, they reduced their demand.

Technological change. A third explanation for the rising earnings premium for college-educated workers is that there has been a general shift in demand in favor of workers with relatively high intellectual as opposed to manual ability. The growing use of computers is thought to have contributed to this phenomenon. To a large degree, the conclusion that technology matters is the result of observing that the earnings distribution has widened in a broad range of industries, and that investment in technology across industries appears correlated with earnings premia for college graduates.

The Berman, Bound, and Griliches (1994) and Lawrence and Slaughter (1993) studies mentioned above are examples of recent research supporting a role for technology. In addition, Brauer and Hickok (1994) examine average pay changes for workers with different levels of educational attainment in 46 industries for the period 1979–89. According to Brauer and Hickok, industry investment in high tech capital such as computers and communication equipment plus overall capital deepening accounted for 60 percent of the explained variation in pay trends for college graduates versus high school dropouts. In agreement with the general findings of Murphy and Welch (1993a) and Berman, Bound, and Griliches (1994), shifts in the demand for the output of different industries was the next most important factor, accounting for about 30 percent of the explained variation. International trade was found to play a lesser role, and contrary to the usual argument, trade with developed countries appeared to play as much of a role as trade with developing countries. Brauer (1995) has extended this mode of analysis to trends across states. This research also indicates a greater role for technology than for trade in explaining the growing premium for a college degree, particularly when the regressions are extended to include the early 1990s.

Employer decisions with respect to training may have exacerbated the tendency of technology to cause incomes to become less equal over time. Most of the workers who receive employer-provided training are technical and managerial workers who have a college degree. Lynch (1994) has estimated that only 4 percent of young workers without a college degree receive formal training at their workplace, and this fraction is lower than in other industrialized countries.

While a growing body of research suggests that technology has caused an increase in the relative pay for college graduates, some questions remain. Howell (1993, 1994) finds that the demand for high-end workers rose before computer usage became widespread in the workplace, and he concludes that institutional and organizational changes have been more influential than technology in affecting relative earnings. More generally, further research is needed on the ramifications of specific types of technological change, as the studies mentioned thus far mostly use very general measures of the state of technology. Some further discussion of preliminary microeconomic investigations is found in a later section.

Institutional Influences on Relative Earnings by Educational Attainment

Aside from shifts in labor supply and labor demand, the more competitive and more conservative social attitudes of the 1980s may have contributed to inequality. To lend support to this argument, researchers have pointed to changes in the role of wage-setting institutions that traditionally have protected the wages of lower-paid (and, typically, less educated) workers. Recent studies have focused on declines in the real value of the minimum wage and in unionization. Institutional differences in how wages are determined may help to explain why inequality has in-

creased so much in the United States compared to other industrialized countries, since demand-side explanations apply similarly across countries.

The U.S. minimum wage remained unchanged in nominal terms throughout most of the 1980s. Horrigan and Mincy (1993) simulate what would have happened to earnings inequality had the minimum wage kept pace with inflation. They find only modest effects for workers with different levels of education (and slightly more noticeable effects on the earnings differences between older and younger workers, and on workers in high- and low-status occupations). They caution, moreover, that the adjustment of the minimum wage would have had virtually no effect on inequality as measured by family income, because of the attenuated relationship between low wages and low family income. That is, some minimum wage earners live in poor families while others live in well-to-do families.

Aside from shifts in labor supply and labor demand, the more competitive and more conservative social attitudes of the 1980s may have contributed to inequality.

From 1969 to 1978, the share of the nonagricultural work force organized in unions in the United States fell from 29 to 25 percent; over the 1980s, the share plummeted to 16 percent. The drop-off in unionization was particularly sharp among younger (that is, 25- to 34-year-old) men who had only a high school education or held blue-collar jobs. Freeman (1993) examines pay differentials between unionized and non-unionized workers, as well as pay changes for workers who changed union status during the 1980s. He concludes that the decline in unionization explains at least 15 percent, and perhaps as much as 40 percent, of the growing disparity between wages for college-educated and high school-educated workers. In a similar vein, Card (1992) finds that changes in unionization account for one-fifth of the increase in the between-quintile variance of adult male wages between 1973 and 1987. His study controls for education, experience, and race, as well as considering whether workers joining unions are similar in "ability" to their nonunionized peers.

DiNardo, Fortin, and Lemieux (1995) consider the influence of both the minimum wage and unionization, as well as supply and demand factors, during the 1980s. They generally find that institutions are quite important for younger workers. For young men (that is, those with less than 10 years of experience), the minimum wage and unionization in combination explain 32 percent of the growing disparity in earnings for college versus high-school graduates—compared to 42 percent for supply and demand (with the remainder unexplained). For young women, the institutional factors (mostly the minimum wage) explain 16 percent. For older men and women, institutions become relatively less important in explaining education-based wage differences, although for men with at least 20 years of work experience unions continue to explain 18 percent of differential earnings trends. DiNardo, Fortin, and Lemieux emphasize that, whatever the explanatory power of institutions in the aggregate, they are important for particular subcategories within the earnings distribution. For example, the lack of indexing of the minimum wage had a sizable impact on low earners. Moreover, they stress that the effects are greater when earnings of part-time workers are also considered.

A growing body of research examines institutions from an international perspective. Most, if not all, advanced countries have been subject to similar influences in terms of sectoral shifts, globalization, and technological change. Gottschalk and Joyce (1992), for example, estimate that a remarkably similar redistribution of employment across sectors has occurred in a number of industrialized countries. Yet the mechanisms by which wages get set differ greatly (Freeman and Katz 1994). In general, wage-setting systems in Continental Europe are far more centralized than in the United States. Freeman and Katz provide the following examples: "In Austria and Sweden . . . peak-level union confederations and employer federations have historically bargained for national wage settlements that cover much of the work force but allow local employers and unions to increase wages above the national settlement through 'wage drift.' In Germany industry or regional collective bargaining determines basic wages for an area and the Ministry of Labor often extends those to all workers. In France the minimum wage is important in determining the overall level of wages, and the French Ministry of Labor also extends contracts. In Italy the Scala Mobile, a form of negotiated wage increase designed to compensate for inflation and which applied effectively to all Italians, increased the pay of low-paid workers faster

than that of high-paid workers throughout the 1980s" (pp. 51–52). Furthermore, the United States—along with the United Kingdom, the Netherlands, and France—experienced a more precipitous drop in unionization during the 1980s than other advanced countries.

In light of these institutional patterns, it is not surprising that the largest overall increases in inequality occurred in the United States and the United Kingdom. In addition, Freeman and Katz note that the largest relative decline in the position of low-wage workers occurred in the United States.

These findings are not without controversy, however. Gottschalk and Smeeding (1995) offer two criticisms. First, it is hard to quantify the extent to which wages are set by institutions. Different measures rank countries somewhat differently, depending on which characteristics of the wage-setting mechanisms receive greater weight. Second, studies err on the side of explaining wage trends by institutions because they do not distinguish between levels and changes. In particular, in a country with strong but weakening institutions, these institutions could be used to rationalize either stability or greater dispersion in wages.

Alternative Explanations: Some Further Thoughts

Most analysts now concede that no one factor is responsible for the rising education wage premium. At a Federal Reserve Bank of New York conference on this topic, the participants indicated in a vote that they believed 60 percent of rising inequality among educational attainment categories has been due to technology, 10 percent to international trade, and 30 percent to other factors—including immigration, a low minimum wage, and changes in wage-setting institutions (Federal Reserve Bank of New York 1995). Indeed, it is striking that so many factors have apparently combined to stretch out the distribution of earnings.

Furthermore, it is difficult—if not impossible—to determine exactly how important a single explanation is because the various explanations are to some extent interlinked. International competition and technological change have caused some industries to decline and others to expand in relative importance. Moreover, technological change and union strength are not entirely exogenous; some investments undoubtedly have taken place under the threat of international competition, and international competition may have been responsible for the changing influence of unions. When different explanations are correlated in an econometric study, their relative effects may be masked. On the other hand, a study that examines only one explanation may exaggerate its influence, to the extent that other relevant (and correlated) factors are omitted.

Changing Returns to Experience

Along with higher returns to education, recent research has found evidence of higher returns to work experience. That is, older workers are being paid relatively more compared to younger workers (Figure 3). The trends vary somewhat between men and women, however, and they seem not to apply as clearly to the old*est* workers. According to the U.S. Department of Labor (1994), men with less than 20 years of potential experience in the work force suffered a real decline in average earnings of close to 7 percent between 1979 and 1992.[7] Men with at least 30 years of potential experience averaged a decline of less than 3 percent, while those with 20 to 29 years of potential experience had no decline. Among women, the earnings of middle-aged workers (that is, women with 10 to 29 years of potential experience) rose by much more than those of younger or older workers.

Along with higher returns to education, recent research has found evidence of higher returns to work experience.

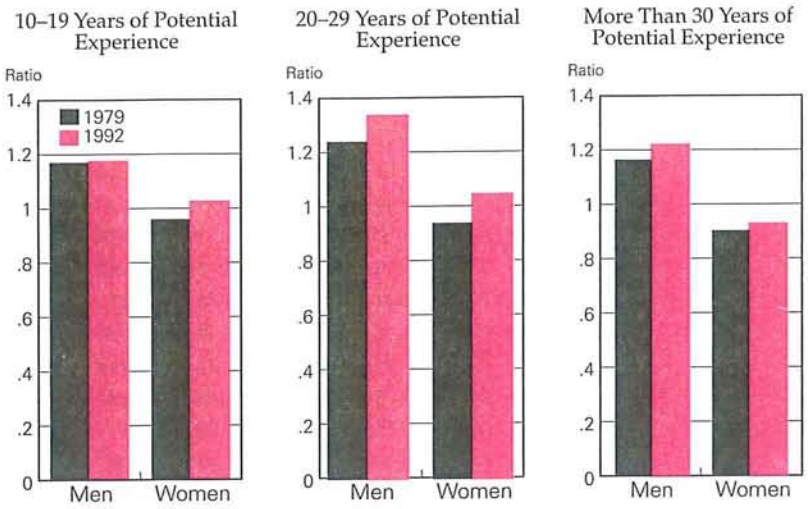
As noted above, it appears that institutional stories apply more strongly to younger workers—that is, their relative wages have fallen as a result of a reduction in the real value of the minimum wage and in unionization. But, in contrast to the proliferation of studies on education, research on the changing returns to experience is not all that extensive.

One important preliminary question is the degree to which the observed wage trends for older and younger workers reflect a cohort effect rather than experience. That is, if the quality of education has fallen over time (as declining college board scores

[7] Potential experience is defined as age minus years of schooling minus six. The statistics refer to annual earnings of full-time year-round workers.

Figure 3

Earnings Ratios of Workers with Various Levels of Potential Experience[a] versus Those with Less than 10 Years of Experience



[a] Potential experience is defined as age minus years of schooling minus six.
Source: U.S. Department of Labor (1994). Annual figures computed for year-round, full-time workers.

would tend to indicate), younger workers would be expected to fall behind, even if the marginal return to experience remained constant. Juhn, Murphy, and Pierce (1993) tend to discount this theory, since they find that the rise in the education premium has been age neutral. Still, this remains an area for further research. For one thing, to the extent that rapid technological change has been important in driving wages, older workers might be expected to be disadvantaged. The rising premium paid to older workers could conceivably be the net outcome of offsetting cohort and technology effects.

Changing Returns to Skill and Other Aspects of Earnings Inequality

The distribution of earnings of persons with similar educational backgrounds and years of experience also has widened. The literature on inequality has dubbed this the "within-group" trend. Juhn, Murphy, and Pierce (1993) estimate that within-group inequality has been increasing since 1970—well before the rising returns to education and experience. They also find that within-group inequality is highly significant. Over the 1964–89 period, 44 percent of the overall rise in inequality as measured by the difference between incomes at the 90th and 10th percentiles is due to trends across education and experience groups and 56 percent to trends within groups.

Juhn, Murphy, and Pierce conclude that the trend in within-group inequality reflects a rising demand for skills that are possessed to different degrees by different workers, since employment has shifted toward industries and occupations that employ skilled workers even in the face of rising relative wages. By contrast, they find little evidence that the rise in inequality is due to growing diversity in the extent of skills possessed by different workers. These skills, which presumably are observable to individual employers, are not yet well understood by researchers. Nor are the reasons for the increased returns to skill. The Levy-Murnane (1992) assessment that within-group inequality is the "most important unresolved puzzle" about earnings trends remains valid, even though we now know more than we did then.

This section reviews studies that attempt specifically to explain the rise in within-group inequality, as well as some more general studies of inequality that do not focus specifically on differences by education and experience. As in Juhn, Murphy, and Pierce, the term "skill" is used here to refer to ability that is not measured by years of education and experience, even though some authors use "skill" either synonymously with these other aspects of ability (particularly education) or as a catchall for all aspects of ability (such as when higher wages are taken as evidence of higher skills). In an attempt to expand our knowledge beyond the studies reviewed here, Peter Cappelli's paper for this symposium explores the characteristics of technology or work organization that are contributing to rising skill requirements for individual employers, and then examines how these skill requirements are reflected in wages paid. Richard Freeman's paper

examines the extent to which wage-setting institutions are responsible for greater earnings inequality.

Uneven Impacts of Structural Change

A possible reason for increased within-group inequality is that broad changes in the mix of industries or occupations inevitably have a more direct effect on some workers than others. For example, workers who are laid off during a period of structural change find it difficult to obtain comparably paid jobs, which would tend to increase differences within a given group in the work force. Or if the number of "bad jobs" is expanding rapidly, a growing number of recent college graduates may be working in positions for which they are overeducated (while others in this education category are more fortunate in their job search). Tyler, Murnane, and Levy (1995) address these topics by asking whether growing numbers of college graduates are taking jobs that pay high school wages. In general, they dispel this hypothesis. The percentage of college graduates with "high-school jobs" fell during the 1980s. By exception, however, the authors estimate that almost 18 percent of college-educated men aged 45 to 54 were in "high-school jobs" in 1989, up from less than 15 percent in 1979.[8] Thus business restructuring appears to have contributed to greater earnings disparities for this group.

A frequently mentioned hypothesis about within-group inequality is that technological change is increasing the demand for skill.

Another aspect of the same theme is that structural change is more pervasive for minority groups or for individuals in certain geographic locations. Bound and Freeman (1991) examine the rising gap in earnings between young black and young white men with similar educational backgrounds from the mid 1970s through the 1980s. The authors find that different economic forces affected different groups of young blacks. In addition to declines in the minimum wage, unionization, and manufacturing jobs, the economic decline in inner cities was found to affect blacks with a high school degree or less—particularly in the Midwest. College graduates, however, did not appear to be affected by geographic factors. By contrast with the Bound-Freeman study, Acs and Danziger (1993) find that low-earning blacks were harmed by a loss of manufacturing jobs, regardless of whether they lived in Northern inner cities or in other locations.[9]

Technology and Workplace Organization

As indicated above, a frequently mentioned hypothesis about within-group inequality is that technological change is increasing the demand for skill. Research by Cappelli (1993) suggests that the relationship between technology and skills may be quite complicated, however. Cappelli examined production workers in a variety of industries using a sample of employers from the late 1970s to the late 1980s. He measured skill requirements using an evaluation system developed by Hay Associates that attempts to capture the autonomy and complexity of jobs. The study found mixed results concerning the role of technology. In manufacturing, individual production jobs required more skill over time, and the mix shifted toward jobs with higher skill requirements. If these changes did not systematically favor production workers with more (or less) education or experience, Cappelli's findings are consistent with rising within-group inequality.[10]

Cappelli found that so-called upskilling of manufacturing jobs was not driven primarily by the implementation of specific technologies such as numerically controlled machines. Rather it seemed to be related to new management views concerning how jobs should be redesigned, as well as to a decline in union power that made their implementation possible. For clerical work, by contrast, changes in skill requirements were related to the introduction of new office technologies, such as word processors and personal computers. Technology had idiosyncratic effects on job requirements, increasing the skill requirements for some and decreasing them for others.

In another study, Scott, O'Shaughnessy, and Cappelli (1994) find that insurance companies have been

[8] Note that this finding conflicts with the generally reported increase in returns to work experience.

[9] Several papers in today's symposium address the role of spatial determinants of inequality within a metropolitan area, with a subset of these also indicating how employment opportunities vary by location.

[10] If the favored workers were more highly educated or more experienced, the results are consistent with the above-noted cross-group trends. Cappelli did not specifically address the issue of whether skills are correlated with education or experience.

moving to a flatter organizational hierarchy. Senior-level managerial jobs are becoming more scarce, but managers' span of control is becoming greater (since a higher fraction of jobs are at lower levels). As a consequence, the payoff to attaining a high-level job has increased.

Research by Osterman (1995) indicates that training practices vary substantially across workplaces. Business establishments that introduce so-called high performance work organizations, that have more "humanistic" values, and whose employees have union representation are relatively more likely to provide training for their workers. While Osterman's research stops short of examining the link between training and pay over time, it does indicate that employers do not react uniformly to economywide influences such as technological change. Future studies of earnings inequality may profitably continue to examine the diversity in employer decision-making.

Training practices vary substantially across workplaces, and employers do not react uniformly to economywide influences such as technological change.

Wage-Setting Institutions

Research on the role of labor market institutions suggests that the declining roles of centralized bargaining and of the minimum wage have given employers more freedom to adjust wages in light of the demands of the workplace. Employers may also have become more inclined in recent years to vary pay to reflect performance for their nonunionized workers.

Freeman (1993) found that, in addition to boosting the wages of their members relative to nonunionized workers, unions tend to reduce the dispersion of earnings within workplaces. Therefore, a decline in unionization could lead to greater within-group inequality. The evidence indicates, however, that inequality of earnings rose roughly as rapidly among union as among nonunion workers between 1978 and 1988. Freeman indicates that this is the result of diminished power of unions in the 1980s, as evidenced by the breakdown of pattern bargaining and the frequency of wage concessions.

Examining almost the same time period as Freeman, DiNardo, Fortin, and Lemieux (1995) concur that unionization is of very limited significance in explaining rising within-group inequality. But they attribute 24 percent of the increase in within-group inequality among men, and 34 percent among women, to the drop in the real minimum wage.

Evidence of a link between changing pay practices for professional and managerial workers and increased inequality is still unavailable. Groshen (1993) examines increasing inequality among nonproduction workers, using a Federal Reserve Bank of Cleveland survey of employers in its district. She finds that changes in human resource management practices, such as linking pay more closely to performance, were not helpful in explaining growing salary differences in the 1980s.

The Relationship between Unemployment, Underemployment, and Inequality

Virtually all of the studies cited so far are limited to individuals with positive earnings. Many of them are restricted to full-time workers or those working a certain number of hours or weeks per year. These adjustments make sense in order to help isolate the causes of growing inequality. But if different groups in the population have different trends with respect to hours worked, these differences could serve to reinforce or offset inequality based on rates of pay.

The evidence suggests that the secular decline in demand for less-skilled workers has resulted in a decrease in both their relative rate of pay and their relative number of hours worked. Topel (1993) finds that the largest declines in wage rates between 1967 and 1989 have occurred for groups for which unemployment and nonparticipation in the work force have increased the most. Furthermore, virtually all of the long-term increase in joblessness has occurred among low-wage men. Haveman and Buron (1994) conclude that the decline in hours worked by low earners (which includes working part-year, part-time, or not at all) plays a large role in the increase in earnings inequality.[11]

[11] The authors indicate that some previous studies underestimated the role of hours worked by choosing a business cycle peak as the starting date for their analysis.

As noted above, it appears that wage-setting institutions in many European countries effectively put a floor on the income earned by those with relatively low wages. If such constraints were introduced in the United States, economic theory suggests that unemployment and underemployment of low earners would increase even more. Indeed, empirical work indicates that unemployment is highest in European countries among low earners. But income inequality is smaller than in the United States because of social welfare programs (Freeman 1994).

The Issue of Permanent Earnings Inequality

The findings on inequality have been interpreted as showing that the poor have become relatively poorer over time, while the rich have gotten richer. But, in fact, the data come from cross sections of workers, rather than tracking of individuals over time. If everyone's income merely became more variable over time, then the data would show greater inequality, but it would not be true that low earners were falling farther behind high earners.

Gottschalk and Moffitt (1994) use panel data for the 1970s and 1980s to distinguish trends in mean income from variation around mean income for individual workers. They find that the permanent and the transitory components of the variance of earnings each increased by 40 percent. Therefore the perception of the poor getting poorer and the rich getting richer is correct—although the change may not be quite as dramatic as had been thought. As for the transitory component, which heretofore had not been studied, Gottschalk and Moffitt find that earnings of union workers and those employed in manufacturing fluctuate less than earnings of nonunion workers and those in service-producing industries. However, deunionization and industrial shifts together explain only 12 percent of the increase in wage instability from the 1970s to the 1980s. Thus, the authors conclude that further research is needed on the sources of transitory income variability.

From Inequality in Earnings to Inequality in Living Standards

Rising inequality in earnings might be viewed as a relatively minor issue if other factors acted to equalize living standards. But, to the contrary, research has shown decisively that in the United States additional influences generally served to reinforce the growing inequality in earnings. Some of these factors are related to the labor market, while others relate to social trends and the role of government.

In contrast to six other major industrialized countries (Australia, Canada, Germany, the Netherlands, Sweden, and the United Kingdom), the United States had a greater increase in family income inequality than in earnings inequality during the 1980s (Gottschalk 1993). For example, the extent of increase in earnings inequality among prime-aged males in the United States and Canada was about the same, but Canada experienced no clear trend in family income inequality as the Lorenz curve shifted in for lower quintiles and out for upper quintiles (Blackburn and Bloom 1993).

One reason for the difference may relate to family structure and associated changes in family work effort. We have evidence on how these factors influenced inequality in the United States without a parallel understanding for other countries. In a comprehensive examination of disparities in the United States, Bradbury (1996) finds that the number of workers per family and hours per worker fell for the poorest quintile and rose for the richest quintile between 1979 and 1993.[12] The United States experienced an increase in female-headed families and in individuals living alone during the 1980s, but Blackburn and Bloom report that Canada did not. Finally, men and women with high earnings in the United States increasingly have tended to marry someone in a similar, rather than a lower, earnings bracket (Murphy and Welch 1993b).[13]

The second reason for the particularly sharp increase in family income inequality in the United States is that decreasing transfer payments and a change in tax structure reinforced the growing disparities in earnings. In Canada, by contrast, public assistance and general social expenditures increased in the 1980s (Blackburn and Bloom 1993; Gramlich, Kasten, and Sammartino 1993; Gottschalk 1993).

[12] As was true for individuals, earnings per hour fell for the poorest quintile and rose for the richest quintile of familiies. Bradbury (1996) indicates this was the most important factor explaining the trend in family income inequality.

[13] The available studies disagree about the effect of the increased tendency of wives to participate in the paid labor force. Murphy and Welch suggest that this trend has led to greater disparities among family incomes since the wife's income is no longer inversely related to that of her husband. However, Cancian, Danziger, and Gottschalk (1993) find that family income inequality in the United States would have increased to an even greater extent over the past 20 years were it not for the increased earnings of wives—especially among black families.

Third, pensions and health insurance in the United States are provided largely at the discretion of individual employers rather than being universal. Little (1995) finds that benefit coverage became less equal in the 1980s.

Finally, looking at the trends of the past several decades in the United States, the 1980s were unique in the relative gains of the rich (Karoly 1993). Presumably, this trend relates to growth in income from capital relative to other sources.

Historically, growth has increased job opportunities for the poor more than for the rich. Given strong macroeconomic growth during much of the decade, the 1980s should have been a period of declining poverty in the United States, all else equal. Instead, the poverty rate rose from 13.6 percent in 1989 to 15.2 percent in 1991. Blank and Card (1993) attribute this increase in poverty to the fact that rising wage inequality and other trends more than offset positive macroeconomic developments. Bradbury (1996) finds that New England, which experienced an economic boom of unusual proportions in the 1980s, was the only region of the country in which the average income of the bottom fifth of families rose during the 1980s, thus indicating that sufficiently strong growth is still able to help the poor.

Conclusions

As studies have increasingly demonstrated the pervasive nature of the rise in earnings inequality, researchers have become more willing to acknowledge that many aspects of labor markets have contributed to the observed trends in the United States. On the supply side, a decrease in the rate of growth of college graduates and an influx of relatively uneducated immigrants help to explain higher returns to education. On the demand side, changes in industrial structure, international trade, and technology all appear to play a role. In addition, wage-setting institutions may cause certain workers to be paid more or less than what the market would indicate. These institutions have changed over time, in ways that have accentuated inequality. Distinguishing the individual effects of different influences remains problematic, however, and may vary with the time period examined and the particular aspect of earnings inequality under examination.

Even as a consensus appears to be building that the rise in inequality has been multi-faceted, some puzzles remain. The papers and discussions at this symposium address such gaps in our knowledge, and their findings are particularly relevant as discussions of inequality turn to possible remedies.

One important question is whether the return to education will continue to increase in the future, given the widespread perception that the U.S. economy is generating many low-quality jobs. If the wage premium for college graduates is expected to hold constant or rise further, then discussions of new policies to augment the supply of educated workers take on greater urgency than if market forces (such as higher college enrollments in response to observed higher earnings) cause the wage premium to decline.

One important question is whether the return to education will continue to increase in the future, given the widespread perception that the U.S. economy is generating many low-quality jobs.

An increasing body of evidence indicates that new workplace technologies are resulting in higher wages for skilled workers (where the concept of skills goes beyond what can be measured by years of education or experience), and that this phenomenon has played an important role in creating wider wage disparities. Yet relatively little is known about how technology influences skill requirements and what can be done to raise the average skill levels of the work force.

Another outstanding puzzle is the extent to which the trend toward inequality can be reversed through reform of U.S. wage-setting institutions. The role of unions and the real value of the minimum wage have been allowed to erode over time. Furthermore, starting in the 1980s reforms of taxes and transfers have tended to reinforce rather than offset the impact of labor market contributions to inequality. If the traditional tools to redistribute income have been neglected in the United States, what can this country learn from foreign experiences and what new institutional options are available?

A final issue is the cost of earnings inequality.

Thus far, studies have not specified clearly what consequences inequality has for macroeconomic performance. Evidence suggests that greater equality in Europe, as compared with the United States, has come at the expense of employment growth. On the other hand, concern is mounting that the United States cannot remain competitive if college-educated workers continue to command higher and higher pay, and if labor skills demanded at high-technology workplaces are in short supply.

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