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The Gender Pay Gap

Have Women Gone as Far as They Can?

After half a century of stability in the earnings of women relative to men, there has been a substantial increase in women's relative earnings since the late 1970s. One of the things that make this development especially dramatic and significant is that the recent changes contrast markedly with the relative stability of earlier years.

These post-1980 earnings changes are also interesting because, when you compare women to their male counterparts, gains have been prevalent across a wide spectrum. So, for example, at first much of the female gains were centered on younger women, but now, while the gains may be a bit larger for younger women, women of all ages have narrowed the pay gap with men. The same broad progress is visible when we look at the trends in the gender pay gap by education. Less-educated women have narrowed the pay gap with less-educated men and highly educated women have narrowed the pay gap with highly educated men.

The earnings gains of women are particularly remarkable because they have occurred during a period when overall wage inequality was rising. That is, the difference in pay between workers with high wages and workers with low wages has widened considerably over the past 25 years or so. And yet, women, a low paid group, have nonetheless been able to narrow the pay gap with a relatively higher paid group, men.

The foregoing supports our initial observation that there has been important, significant progress for women. On the other hand, however, there is still a gender pay gap. Women continue to earn considerably less than men on average. It is also true that convergence slowed noticeably in the 1990s after women had especially gained relative to men in the 1980s. Although there were some larger gains for women in the early 2000s, the long-run significance of this recent experience is unclear. With the evidence suggesting that convergence has slowed in recent years, the possibility arises that the narrowing of the gender pay gap will not continue into the future. Moreover, there is evidence that although discrimination against women in the labor market has declined, some discrimination does still continue to exist.

Trends in the Gender Pay Gap

In this section we look in more detail at the trends in the relative wages of women. Figure 1 presents data drawn from published government statistics on female-to-male earnings ratios of full-time workers. We focus on full-time workers to adjust for gender differences in hours worked. This is important because women are more likely than men to work part-time. Ideally we would like a measure of wages or an hourly rate of pay. Unfortunately, we do not have a similar long

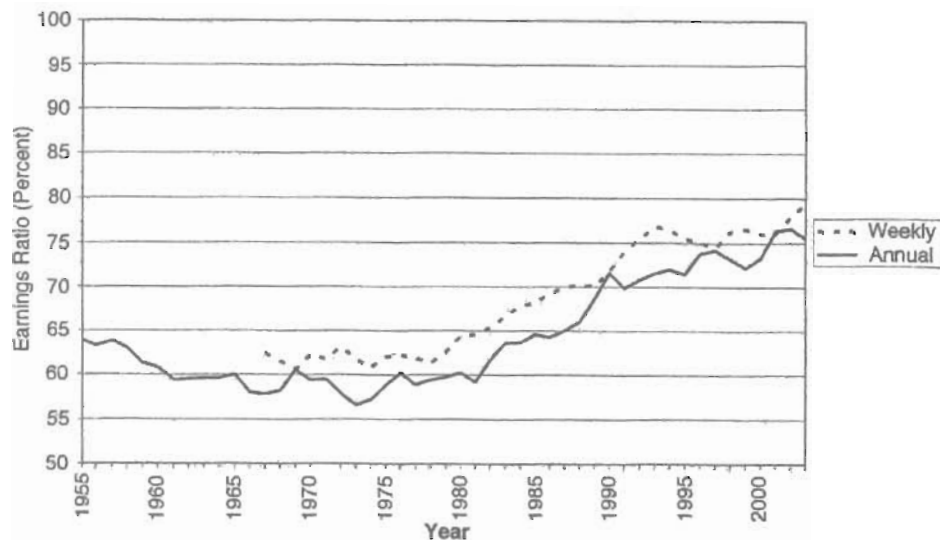


Figure 1. Female-to-Male Earnings Ratios of Full-Time Workers 1955–2003

data series for hourly wages. Thus, we focus here on the earnings of full-time workers.

The figure gives the gender earnings ratio for two data series available from published government statistics. Again, both pertain to the relative earnings of female and male full-time workers. The first, the annual earnings series, is based on annual earnings data on workers who are employed year round as well as full time. The second, the weekly earnings series, is based on the earnings of full-time workers over the survey week, regardless of how many weeks per year the individual works. The annual earnings series has been available for the longest time period, 1955 to 2003; the weekly earnings series has been available for a somewhat shorter period, 1967 to 2003.

While the exact figure for the gender earnings ratio differs a bit for the two series, they both tell the same story in terms of the trends. Until the late 1970s or early 1980s there was a remarkable constancy in the ratio, at around 60%. There were some year-to-year fluctuations, but the ratio hovered around the 60% level. Indeed, if there was any discernible trend, it was a decrease in the ratio between 1955 and 1960. Then, over the 1980s, we see a period of strong, sus-

tained increase in the ratio. This rising trend prevailed through perhaps 1990 or 1993, depending on the series. However, during the 1990s, the pace of convergence in both the annual and the weekly earnings series slowed and both series behaved more erratically. The pace of change picked up again in the early 2000s.¹ However, as noted above, the long-run significance of this recent experience is unclear. It may signal a resumption of a strong, long-run trend towards convergence in male–female earnings or may prove to be of only short duration.²

Abstracting from the differential trends over the various subperiods and focusing on the period since the late 1970s as a whole, the gains have been quite remarkable, especially viewed in terms of the long constancy in the gender ratio that preceded this time. So, for example, based on the weekly earnings series, the gender ratio rose from 61.3% in 1978 to 79.4% in 2003. Again, much of this increase was accomplished in a relatively short period of time, with the ratio reaching 76.8% by 1993. Of course, the 77–79% figure remains below earnings parity. Thus, clearly all sources of the pay differential between men and women have not been eradicated.

How do we explain these earnings gains for women? To address this question as well as to understand why women continue to earn less than men, we need to first consider the basic factors that explain the gender pay gap to begin with.

Economists' Explanations for the Gender Pay Gap

The Role of Qualifications and Discrimination

Economists point to a number of factors that could be important in explaining the lower earnings of women compared to men, but traditionally have focused on two primary factors. Following Juhn, Murphy, and Pierce (1991), we call these "gender-specific" factors in that they relate specifically to differences between women and men, either in their qualifications or how they are treated. With regard to qualifications, the human capital model has been especially important in pointing out the potential role played by education and experience.

The gender gap in educational attainment was never particularly large in the United States. The biggest difference historically was that, although women were more likely to graduate from high school than men, they were less likely to go on to college and graduate education. Moreover, men tended to concentrate in career-oriented fields of study such as engineering, law, medicine and business that led to relatively high earnings. These educational differences have decreased quite a bit in recent years, especially at the college level where women are actually now over half of college students; women have also greatly increased their representation in traditionally-male professional fields. Thus gender differences in education levels have never explained a large portion of the overall gender pay gap; most recently, in some samples gender differences in years of schooling favor women.

The qualification that has proven to be quite important is work experience because tradi-

tionally women moved in and out of the labor market based on family considerations. Before World War II, most women left the labor market permanently when they got married and had children. In the immediate post-war period, a pattern arose whereby older married women returned to the labor market after their children were in school or grown. An even bigger change has occurred in the past 20 to 30 years as increasing numbers of women, including married women, started staying in the labor force fairly continuously even when they had small children at home. Today, even the majority of women with children a year or less in age are participating in the labor force. Nonetheless, on average, women have less work experience than men and that difference in qualifications is quantitatively important in explaining the gender pay gap.

Jacob Mincer and Solomon Polachek (1974) have done especially important work in highlighting the role of labor market experience in explaining the gender pay gap. Given the traditional division of labor by gender in the family, women tend to accumulate less labor market experience than men. Further, because women anticipate shorter and more discontinuous work lives, they have lower incentives to invest in market-oriented formal education and on-the-job training. Their resulting smaller human capital investments lower their earnings relative to those of men. An additional way in which the traditional division of labor may disadvantage women is that the longer hours women spend on housework may also decrease the effort they put into their market jobs compared to men, controlling for hours worked, and hence also reduce their productivity and wages (Becker, 1985).

To the extent that women choose occupations for which on-the-job training is less important, gender differences in occupations are also expected. Women may especially avoid jobs requiring large investments in skills that are unique to a particular enterprise, because the returns to such investments are reaped only as long as one remains with that employer. At

the same time, employers may be reluctant to hire women for such jobs because the firm bears some of the costs of such firm-specific training, and fears not getting a full return on that investment.

However, even controlling for experience and whatever other qualifications can readily be measured, there tends to be a pay difference between men and women that is not explained and is potentially due to discrimination. Gary Becker (1971; 1st ed., 1957) has been especially instrumental in developing analyses of labor market discrimination. Although he was looking at differences between blacks and whites, the idea of prejudice and its negative consequences are readily transferable to women versus men. Becker conceptualized discriminatory preferences as the desire to maintain social distance from the discriminated group. It may at first seem odd to hypothesize that men would not like to associate with women on the job when they generally live together with women in families. However, the issue here may be more one of socially appropriate roles than of the desire to maintain social distance, as Becker postulated was the case with race.

Standard models in economics suggest discrimination can arise in a variety of ways. In Becker's model, discrimination is due to the discriminatory tastes of employers, co-workers, or customers. Alternatively, in models of "statistical discrimination," differences in the treatment of men and women arise from average differences between the two groups in the expected value of productivity (or in the reliability with which productivity may be predicted), which may lead employers to discriminate on the basis of that average (see for example, Aigner & Cain, 1977). Finally, discriminatory exclusion of women from "male" jobs can result in an excess supply of labor in "female" occupations, depressing wages there for otherwise equally productive workers, as in Bergmann's (1974) "overcrowding" model.

The typical approach to analyzing the sources of the gender pay gap is to estimate

wage regressions specifying the relationship between wages and productivity-related characteristics for men and women. The gender pay gap may then be statistically decomposed into two components: one due to gender differences in measured characteristics, and the other "unexplained" and potentially due to discrimination. Such empirical studies provide evidence consistent with both human capital differences and labor market discrimination in explaining the gender pay gap.

However, any approach that relies on a statistical residual will be open to question as to whether all the necessary explanatory variables were included in the regression. For example, even if measured human capital characteristics can explain only a portion of the wage gap between men and women, it is possible that unmeasured group differences in qualifications may explain part of the residual. If men are more highly endowed with respect to these omitted variables then we would overestimate discrimination. Alternatively, if some of the factors controlled for in such regressions—like occupation and tenure with the employer—themselves reflect the impact of discrimination, then discrimination will be underestimated. Moreover, if women face barriers to entry into certain occupations, they may have higher unmeasured productivity than men in the same jobs. This factor would also suggest an underestimate of discrimination if we controlled for occupation.³

Using the residual from a regression to estimate the effects of discrimination will also run into trouble if feedback effects are important. Even small initial discriminatory differences in wages may cumulate to large ones as men and women make decisions about human capital investments and time allocation in the market and the home on the basis of these wage differentials.

Results of statistical studies of the gender pay gap may nonetheless be instructive. Representative findings from analyses of this type may be illustrated by results from a recent paper of ours (Blau & Kahn, 2006). Using

data from the Panel Study of Income Dynamics (PSID), which contains information on actual labor market experience for a large, nationally representative sample, we found a wage differential between male and female full-time workers in 1998 of 20%. The restriction to full-time workers is designed to focus on male and female workers who are as similar as possible.⁴

The impact of gender differences in characteristics on the male-female wage differential is shown in Table 1. The variables considered include indicators of "human capital," that is, those relating to education and experience, as well as measures of occupation, industry and union status. (Race is also included as a control variable, but its effect is small since the proportion of each race group in the full-time sample is about the same for men and women.)

As would be expected, women's lesser amount of labor market experience is found to be a significant determinant of the gender wage differential, explaining 11% of the gender gap in wages. This reflects a 3.5 year difference in full-time experience between men and women, which, though smaller than in previous years, is still a substantial factor explaining the wage gap. Interestingly, women in this subsample are found to have higher educational attainment than men, which (as indicated by the negative sign in the table) works to *lower* the gender wage gap by 7%. Putting this somewhat differently, gender differences in educational attainment do not help to explain the gender wage gap, but rather work slightly in the opposite direction. While in the population as a whole, men's educational attainment is still somewhat higher than women's, when we focus on a sub-sample of the population which is not only employed, but employed full time, women have a slight edge.

Finally, gender differences in occupation and industry are substantial and help to explain a considerable portion of the gender wage gap. Men are more likely to be in blue-collar jobs and to work in mining, construc-

Table 1. Contribution to the Wage Differential Between Men and Women of Differences in Measured Characteristics, 1998

<i>Characteristics</i>	<i>Percent Explained</i>
Educational attainment	-6.7
Labor force experience	10.5
Race	2.4
Occupational category	27.4
Industry category	21.9
Union status	3.5
Unexplained	41.1
Total	100.0
Wage differential (%)	20.3

Source: Calculated from data presented in Blau and Kahn (2006).

tion, or durable manufacturing; they are also more likely to be in unionized employment. Women are more likely to be in clerical or professional jobs and to work in the service industry. Taken together, these variables explain 53% of the gender wage gap—27% for occupation, 22% for industry, and an additional 4% for union status.⁵

Although these findings suggest that gender differences in work-related characteristics are important, they also indicate that qualifications are only part of the story. The proportion of the wage differential that is *not* explained by these types of productivity-related characteristics includes the impact of labor market discrimination, although as mentioned above, the residual may also include the effects of gender differences in unmeasured productivity levels or non-wage aspects of jobs. In this case, 41% of the gender gap cannot be explained even when gender differences in education, experience, industries, occupations, and union status are taken into account. We can consider the results of this study somewhat differently by focusing on the gender wage ratio. The actual ("unadjusted") gender wage ratio is 80%; that is, women's wages are, on average, 80% of men's wages. If women had the same human capital characteristics (that is, education and experience), racial composition, industry and occupational distribution, and union coverage

as men, the “adjusted” ratio would rise to 91% of men’s wages. Thus, while measured characteristics are important, women still earn less than similar men even when all measured characteristics are taken into account. And, as we suggested above, including controls for occupation, industry, and union status may be questionable to the extent that they may be influenced by discrimination.

Nonetheless, the residual gap, however measured, may well reflect factors apart from discrimination. One that has received particular attention recently is the impact of children on women’s wages, since evidence of a negative effect of children on wages has been obtained, even in analyses which control for labor market experience (Waldfogel, 1998). The reason may be that, in the past, having a child often meant that a woman withdrew from the labor force for a substantial period, breaking her tie to her employer and forgoing the returns to any firm-specific training she might have acquired, as well as any rewards for having made an especially good job match. Given the sharp increase in the labor force participation of women with young children that has occurred since the 1960s, this factor may have been of growing importance in influencing the aggregate gender gap. However, the greater availability of parental leave, legally mandated in the United States since 1993, may well mitigate the effect of this factor on more recent cohorts. Indeed, Waldfogel finds that the negative effect of children on wages is substantially reduced for mothers who have maternity leave coverage.

Some studies of discrimination have taken different approaches to the question, thus avoiding some of the problems of traditional analyses. First, two studies have applied traditional econometric techniques to especially homogeneous groups and employed extensive controls for qualifications, thus minimizing the effect of gender differences in unmeasured productivity characteristics. Wood, Corcoran, and Courant (1993) studied grad-

uates of the University of Michigan Law School classes of 1972–1975, 15 years after graduation. The gap in pay between women and men was relatively small at the outset of their careers, but 15 years later, women graduates earned only 60% as much as men. Some of this difference reflected choices that workers had made, including the propensity of women lawyers to work shorter hours. But, even controlling for current hours worked, as well as an extensive list of worker qualifications and other covariates, including family status, race, location, grades while in law school, and detailed work history data, such as years practiced law, months of part-time work, and type and size of employer, a male advantage of 13% remained. In a similar vein, Weinberger (1998) examined wage differences among recent college graduates in 1985. Her controls included narrowly defined college major, college grade point average, and specific educational institution attended. She found an unexplained pay gap of 10 to 15% between men and women.

A second set of studies used an experimental approach. Neumark (1996) analyzed the results of a hiring “audit” in which male and female pseudojob seekers were given similar résumés and sent to apply for jobs waiting on tables at the same set of Philadelphia restaurants. In high-priced restaurants, a female applicant’s probability of getting an interview was 40 percentage points lower than a male’s and her probability of getting an offer was 50 percentage points lower. A second study examined the impact of the adoption of “blind” auditions by symphony orchestras in which a screen is used to conceal the identity of the candidate (Goldin & Rouse, 2000). The screen substantially increased the probability that a woman would advance out of preliminary rounds and be the winner in the final round. The switch to blind auditions was found to explain 25% of the increase in the percentage female in the top five symphony orchestras in the United States, from less than 5% of all musicians in 1970 to 25% in 1996.

Third, several recent studies have examined predictions of Becker's (1971) discrimination model. Becker and others have pointed out that competitive forces should reduce or eliminate discrimination in the long run because the least discriminatory firms, which hire more lower-priced female labor, would have lower costs of production and should drive the more discriminatory firms out of business. For this reason, Becker suggested that discrimination would be more severe in firms or sectors that are shielded to some extent from competitive pressures. Consistent with this reasoning, Hellerstein, Neumark, and Troske (2002) found that, among plants with high levels of product market power, those employing relatively more women were more profitable. In a similar vein, Black and Strahan (2001) report that, with the deregulation of the banking industry beginning in the mid-1970s, the gender pay gap in banking declined as men's wages fell by considerably more than women's (12% vs. 3%). This suggests that during the period of regulation, banks shared the rents fostered by regulation primarily with men. It was thus men who lost the most in the shift to deregulation. And, Black and Brainerd (2004) find that increasing vulnerability to international trade reduced apparent gender wage discrimination in concentrated industries, again as predicted by Becker's (1971) model.

Finally, additional evidence on discrimination comes from court cases. A number of employment practices which explicitly discriminated against women used to be quite prevalent; including marriage bars restricting the employment of married women (Goldin, 1990), and the intentional segregation of men and women into separate job categories with associated separate and lower pay scales for women (e.g., *Bowe v. Colgate-Palmolive Co.*, 416 F.2d 711 [7th Cir. 1969]; *IUE v. Westinghouse Electric Co.*, 631 F.2d 1094 [3rd Cir. 1980]). While many such overt practices have receded, recent court cases

suggest that employment practices still exist which produce discriminatory outcomes for women.

For example, in 1994, Lucky Stores, a major grocery chain, agreed to a settlement of \$107 million after Judge Marilyn Hall Patel found that "sex discrimination was the standard operating procedure at Lucky with respect to placement, promotion, movement to full-time positions, and the allocation of additional hours" (*Stender v. Lucky Stores, Inc.* 803 F. Supp. 259; [N.D. Cal. 1992]; King 1997). And, in 2000, the U.S. Information Agency agreed to pay \$508 million to settle a case in which the Voice of America rejected women who applied for high-paying positions in the communications field. A lawyer representing the plaintiffs said that the women were told things like, "These jobs are only for men," or "We're looking for a male voice" (FEDHR, 2000). A final example is the 1990 case against Price Waterhouse, a major accounting firm, in which the only woman considered for a partnership was denied, even though, of the 88 candidates for partner, she had brought in the most business. Her colleagues criticized her for being "overbearing, 'macho' and abrasive and said she would have a better chance of making partner if she would wear makeup and jewelry, and walk, talk and dress 'more femininely.'" The Court found that Price Waterhouse maintained a partnership evaluation system that "permitted negative sexually stereotyped comments to influence partnership selection" (BNA, 1990; Lewin, 1990).

Oftentimes, economists serve as expert witnesses in court cases alleging discrimination. Their analyses, when publicly available, provide a window into discriminatory practices that still exist to some extent in the labor market, although there is of course likely to be disagreement between experts employed by each side in the type of evidence that is relevant or in the interpretation of the evidence. For example, the Lucky

Stores case cited above generated an interesting exchange summarized in Taylor (2001).⁶

Labor economist John Pencavel testified for the plaintiffs, the women who brought the suit. He found that women at Lucky earned between 76 percent and 82 percent as much as Lucky's male workers earned. Pencavel found that women were regularly placed in jobs that paid less than jobs given male coworkers, although there was no significant difference between the education and experience of the workers. There was little difference in the wages of the male and female workers within each type of job; but some jobs paid more than others and women happened to be assigned to the lower-paying jobs.

Joan Haworth, another labor economist, was an expert witness for the defendant, Lucky Stores. She reported survey evidence showing that Lucky's assignment of women and men to different jobs reflected differences in the work preferences of men and women. Thus, Lucky justified its job assignments by arguing that there was a gender difference in attitudes toward work. Lucky argued that its employment policies were based on observed differences in the career aspirations of male and female employees. For example, one manager at Lucky testified that women were more interested in cash register work and men were more interested in floor work.

As we noted above, Judge Marilyn Hall Patel decided the case in favor of the plaintiffs. With respect to the evidence cited above, she wrote: "The court finds the defendant's explanation that the statistical disparities between men and women at Lucky are caused by differences in the work interests of men and women to be unpersuasive." An interesting aspect of this case is that both sides agreed that male and female employees received equal pay for equal work and that the pay differential was associated with pay differences across occupations. They differed, however, over the source of the occupational

differences: the choices of women vs. discrimination. This disagreement mirrors the alternative explanations economists offer in general for wage and occupational difference between men and women: differences in qualifications based on the choices men and women make versus discrimination which limits the opportunities and pay of women compared to men.

Some additional evidence supporting discrimination as a source of the type of occupational differences cited above is provided by a recent study of eight years of data from an unidentified regional grocery chain on gender differences in job titles and wage rates (Ransom & Oaxaca, 2005). As in the case of the Pencavel analysis summarized above, Ransom and Oaxaca find a pattern of gender differences in initial job assignment and upward mobility within the firm that "generally penalized women, even when the analysis account[ed] for individuals' characteristics" (p. 219). While one might again dispute the reason for these differences, the authors found that job segregation of women and men was dramatically lower in the period after the company lost a discrimination suit (1984) and reached a settlement (1986) in which it initiated affirmative action policies. This implies that it was possible to find women interested in higher-level jobs, leading one to doubt that such segregation was entirely voluntary.

These cases emphasize the role of occupational segregation by sex within firms in producing pay differences between men and women. Pencavel explicitly notes that there was little difference in pay between men and women in the same job. It is worth noting that economists and sociologists who have examined this issue across a wider range of firms have tended to come to a similar conclusion: pay differences between men and women in the same narrowly-defined occupational categories within the same firm tend to be small (Blau, 1977; Groshen, 1991; Petersen & Morgan, 1995; and Bayard, Heller-

stein, Neumark, & Troske, 1999). However, even when men and women are in the same occupation, they tend to be segregated by firm, and such establishment segregation contributes substantially to the gender pay gap.

The Role of Wage Structure

In earlier work, building on a framework suggested by Chinhui Juhn, Kevin Murphy, and Brooks Pierce (1991), we point out that there is another factor that needs to be considered when analyzing gender differences in pay, and that is what we call wage structure (Blau & Kahn, 1996 and 1997). We define wage structure as being the market returns to skills and the rewards for employment in particular sectors of the economy. Market returns to skills denote the premiums the market determines for being a more experienced worker or a more highly educated worker, etc. Rewards for employment in particular sectors of the economy refer to the fact that, for example, unionized workers tend to earn more than comparable nonunionized workers or workers in some industries—durable goods, manufacturing for example—may earn more than similarly-qualified workers in other industries, say services. In addition, considerable research suggests that predominantly female occupations pay less, even controlling for measured personal characteristics of workers and a variety of characteristics of occupations, although the interpretation of such results remains in some dispute.⁷

We distinguish wage structure from gender-specific factors because the idea is that these are the returns to skills or the rewards for working in a particular industry or occupation regardless of whether you are male or female. Why should wage structure affect the gender pay gap? To see how, let's think a bit more about the two factors we discussed earlier—gender differences in qualifications and labor market discrimination. Suppose women do have less experience, on average, than men do. Then, the higher the return to experience the larger the gender pay gap will

be. Or, suppose that jobs staffed primarily by women do pay less than jobs staffed primarily by men. Then, the higher the premium for being in a male occupation the larger the gender pay gap will be.

This is interesting because these market returns have in fact varied over time. In the last 25 years or so, the market returns to skills, like those acquired with work experience, have increased. So this is a factor that, taken alone, would have worked to increase the gender pay gap. The rewards to being in male occupations and industries have increased as well, and that factor, taken alone, would have increased the pay gap as well. So, one question that we have raised in our research is: How have women been able to successfully swim against the tide of rising returns to skills and rising rewards to being in particular industries and occupations? That is, how have they managed to narrow the pay differential with men in the face of the adverse trends in wage structure that have worked against them?

Before looking at the results of our research addressing these questions, let's consider the issue of why the returns to skills have been increasing. There is a fairly broad consensus among economists (though not complete unanimity) that within countries like the United States, one of the main reasons that the returns to skills have been rising is that the demand by employers for skilled workers has been rising relative to the demand for unskilled workers. Why has this occurred? There are at least two reasons. The one that that we would put the most weight on is technological change. The information and telecommunications revolution has worked to put more of a premium on skill, at least thus far. There are other scenarios possible, but thus far it has increased the demand for skilled workers compared to less skilled workers. The other reason—we would put less weight on it although it has also played a role—is international trade. Today, less skilled workers in the United States are to

some extent competing against less skilled workers from around the world; many of them are available at much lower wages. Factors in addition to demand shifts that appear to have also played a role are—a decline in the union movement since unions tend to push for more egalitarian pay structures, the falling real value the minimum wage (adjusted for inflation, the minimum wage is actually lower today than it was in the 1970s), an influx of unskilled immigrants, and a decrease in the rate of growth of college-educated workers.

While rising returns to skills may be hypothesized to widen the gender pay gap, all else equal, it is possible that the demand shifts discussed above may have favored women relative to men in certain ways, and thus contributed to a decrease in the unexplained gender pay gap (Blau & Kahn, 1997; Welch, 2000). Technological change is believed to have caused within-industry demand shifts that favored white collar workers in general (Berman, Bound, & Griliches, 1994). Given the traditional male predominance in blue-collar jobs, this shift might be expected to benefit women relative to men. Similarly, to the extent that the spread of computer technology is an important source of recent technological change, the observation that women are more likely than men to use computers at work suggests that women as a group may have benefited from shifts in demand associated with computerization (Autor, Katz, & Krueger, 1998; Weinberg, 2000). Diffusion of computers likely also benefits women because computers restructure work in ways that de-emphasize physical strength (Weinberg, 2000).

Explaining the Trends: The 1980s

Returning to the trends in the gender pay gap—how do we explain them? To answer this question, we summarize results from Blau and Kahn (1997 and 2006). Using data from the PSID (we reported on some of our results above), we analyzed women's

wage gains over the 1980s (1979–1989), which, as we saw in Figure 1, was a period of exceptionally rapid closing of the gender wage gap. We found that higher rewards to skills did indeed retard wage convergence during this period but this was more than offset by improvements in gender-specific factors.

Of particular importance was the decline in the experience difference between men and women: the gender gap in full-time experience fell from 7.5 to 4.6 years over this period. Shifts in major occupations played a significant role too, as the employment of women as professionals and managers rose relative to men's, while their relative employment in clerical and service jobs fell. Women's wages also increased relative to men's because of deunionization (the decline of unions). Deunionization had a larger negative impact on male than female workers because men, who have traditionally been more likely than women to be unionized, experienced a larger decrease in unionization than women. Another factor that worked to increase the gender pay ratio substantially was a decrease in the "unexplained" portion of the gender differential—that is, a decline in the pay difference between men and women with the same measured characteristics (i.e., experience, education, occupation, industry, and union status).

Taken together, changes in qualifications and in the unexplained gap worked to increase the gender wage ratio substantially. Working in the opposite direction, however, were changes in wage structure (or returns to characteristics) that favored men over women during this period. Of particular importance were a rise in the return to experience (since women have less of it) and increases in returns to employment in industries where men are more highly represented. These shifts in labor market returns by themselves would have reduced the gender ratio substantially. Thus, in order for the wage gap to decline, the factors favorably af-

fecting women's wages had to be large enough to more than offset the impact of unfavorable shifts in returns. This was indeed the case, so that the gender pay gap did decline over the 1980s.

Can we say anything about the reasons for the decline in the unexplained gender wage gap that occurred over the 1980s? Such a shift may reflect a decline in labor market discrimination against women, but also an upgrading of women's *unmeasured* labor market skills, a shift in labor market demand favoring women over men, or changes in the composition of the labor force due to the pattern of labor force entries or exits. Indeed all of these factors may well have played a role, and all appear credible during this period.

First, since women improved their relative level of measured skills, as shown by the narrowing of the gap in full-time job experience and in occupational differences between men and women, it is plausible that they also enhanced their relative level of unmeasured skills. For example, women's increasing labor force attachment may have encouraged them to acquire more on-the-job training or encouraged their employers to offer them more training. Evidence also indicates that gender differences in college major, which have been strongly related to the gender wage gap among college graduates (Brown & Corcoran, 1997), decreased over the 1970s and 1980s (Blau, Ferber, & Winkler, 2002); the marketability of women's education has probably improved. The male-female difference in SAT math scores has also been declining, falling from 46 points in 1977 to 35 points in 1996 (Blau, Ferber, & Winkler, 2002), which could be another sign of improved quality of women's education.

Second, the argument that discrimination against women declined in the 1980s may seem less credible than that their unmeasured human capital characteristics improved, since the federal government scaled back its antidiscrimination enforcement ef-

fort during the 1980s (Leonard, 1989). However, as women increased their commitment to the labor force and improved their job skills, the rationale for statistical discrimination against them diminished; thus it is plausible that this type of discrimination decreased. Further, in the presence of feedback effects, employers' revised views can generate additional increases in women's wages by raising women's returns to investments in job qualifications and skills. To the extent that such qualifications are not fully controlled for in the statistical analysis used to explain the change in the gender wage gap, this may also help to account for the decline in the "unexplained" gap. Another possible reason for a decline in discrimination against women is that changes in social attitudes have made such discriminatory tastes increasingly less acceptable.

Third, the underlying labor market demand shifts that widened wage inequality over the 1980s may have favored women relative to men in certain ways, and thus may have also contributed to a decrease in the unexplained gender gap. Overall, manufacturing employment declined. In addition, there is some evidence that technological change produced within-industry demand shifts that favored white-collar relative to blue-collar workers in general. As noted above, given the traditional male predominance in blue-collar jobs, this shift might be expected to benefit women relative to men, as would increased computer use.

Finally, another factor contributing to the considerable narrowing of the "unexplained" gender wage gap in the 1980s appears to be favorable shifts in the composition of the female labor force. Specifically, we found that, controlling for the measured characteristics mentioned earlier, the women who entered the labor force over this period tended to be those with relatively high (unmeasured) skills. This improved the quality of the female labor force and thus contributed to the narrowing of the gender wage gap. . . .

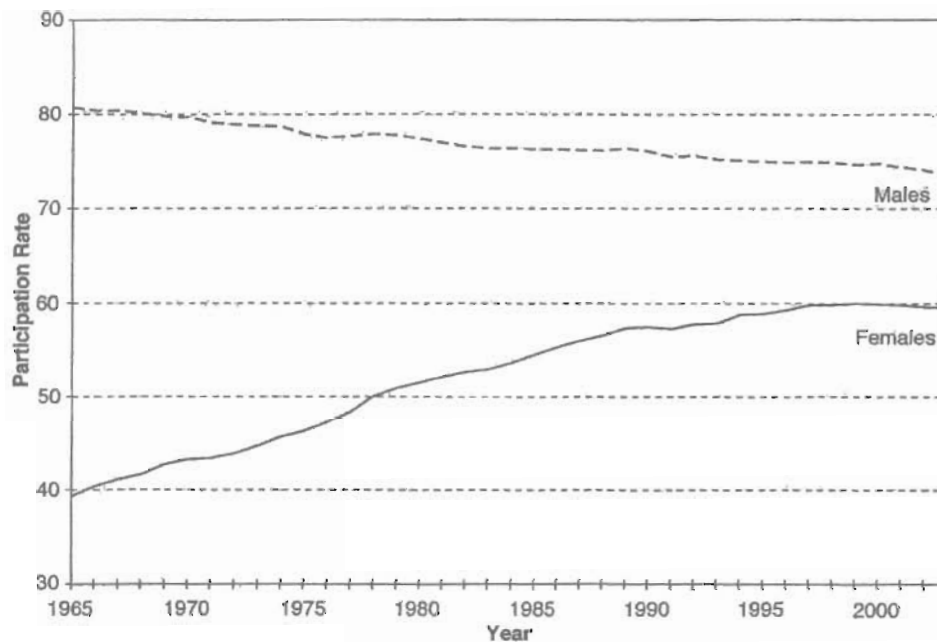


Figure 2. Trends in Female and Male Labor Force Participation Rates, 1965–2003

Explaining the Trends: The 1990s

Why did convergence in female and male wages slow over the 1990s? Again, drawing on our previous work (Blau & Kahn, 2006) we may suggest some tentative answers. We found that human capital trends cannot account for the slowdown: women improved their relative human capital by about the same amount in both the 1980s and the 1990s. In the 1980s this upgrading consisted of rising relative experience while in the 1990s it consisted to a lesser extent of rising relative experience and to a greater extent of increasing educational attainment of women relative to men. Nor did changes in wage structure in the 1990s have a more adverse effect on women than changes in the previous decade—in fact the impact of changing wage structure was actually more negative for women in the 1980s. Slowing convergence in men's and women's occupations and degree of unionization in the 1990s was found to account for some of the slowdown, but only a small portion.

We found that the major reason for the slowdown in wage convergence in the 1990s was the considerably smaller narrowing of the “unexplained” gender pay gap in the 1990s compared to the 1980s. Our reasoning above suggests that this could be due to slower improvement in women's unmeasured qualifications relative to men's in the 1990s than in the 1980s; a smaller decline in discrimination against women in the 1990s than in the 1980s; or less favorable demand shifts for women in the 1990s than in the 1980s. Each of these factors appears to have played a role in explaining the observed trends. In addition, controlling for measured characteristics, female labor force entrants were less skilled during the 1990s, perhaps as a result of the entry of many relatively low-skilled, female single-family heads. Indeed, differences between the two decades in such shifts in labor force composition were found to explain as much as 25% of the apparent slowdown in convergence in the unexplained gender pay gap in the 1990s.

As we noted above, women narrowed the experience gap at a slower pace in the 90s than they did in the 80s. Figure 2 shows the trends in male and female labor force participation that underlie this development. The most striking trend shown in the figure is that the *difference* in the participation rates of men and women has narrowed considerably since the starting year, 1965. This is due to a slow steady decrease in male labor force participation combined with a much sharper and dramatic increase in female labor force participation. The decrease in male participation does not appear to be due very much to changes in gender roles. Rather it primarily reflects the fact that men are retiring at earlier ages and are staying in school longer. Another factor has been the weakening job market for less skilled men (Juhn, 1992).

While the data in the figure begin in the mid-1960s, the large increases in female participation in fact date back to the 1940s. Interestingly, the trend towards rising female labor force participation was strong and consistent until about 1990. After that the line becomes noticeably flatter. Women's participation increased a bit through 1997, with no further increases thereafter.

How do these participation trends relate to the average experience levels of women workers? Unfortunately, it is not possible to figure this out just by looking at participation rates. This is because the labor force participation rate of women can increase for either of two reasons or a combination of both. On the one hand, participation may rise because a lot of new groups of women come into the labor market. This tends to lower the average experience of women workers because there are a lot of new entrants. On the other hand, participation can increase because women stay in the labor force more consistently over a period of time, rather than moving in and out. This works to raise average experience levels of women workers.

Research has shown that during the 1970s the average experience of women did not in-

crease because those two factors counter balanced each other. There were a lot of new entrants and a lot of women staying in more continuously, thus average experience remained about the same (Goldin, 1990). In the 1980s, though, the increase in the labor force participation of women was due to more of them remaining in the labor force more consistently. And, as we have seen, the average experience of women workers rose accordingly. This suggests that the flattening of the trend in female labor force participation shown in the chart caused the gender gap in experience to decline more slowly in the 1990s than in the 1980s.

Before leaving the subject of the participation trends, it is interesting to consider their larger significance. Viewed more broadly, what the trends show is an enormous change in gender roles and a movement away from the traditional family of breadwinner husband and homemaker wife to a family where both husband and wife work outside the home, although not necessarily giving equal weight to each of their careers. Ralph Smith (1979) called this process a "subtle revolution." The trends suggest that this subtle revolution, having accomplished a great deal, may be slowing down now. Is it stopping? Not necessarily. But we have reached a situation where, looking at women in the prime working ages (that is, 25 to 55), over three quarters of them are in the labor force. This means that female labor force participation rates in the United States are very high, although still below the male rates of around 90% in this age group. So it may not be surprising that, of necessity, future participation trends will be less dramatic than past trends.

Prospects for the Future

Although we readily acknowledge that predicting the future is a tricky business, we cautiously offer some thoughts on the prospects for the future. What will happen to the gender pay gap in the coming years? Recent developments make the answer to this

question particularly uncertain. As we have seen, after a period of consistent and sustained narrowing of the gender pay gap over the 1980s, convergence became more fitful in the 1990s. Perhaps what we saw in the 1990s was a mere pause; perhaps we were consolidating the really massive changes that had occurred over the preceding 10 to 20 years—not just in the gender pay gap but also in women's labor force participation and in the occupations in which they work; perhaps the next 20 years will show similar renewed gains on all these fronts. That could very well be. Or we may have reached a point that we are going to stay at for quite a while, a big change from the past but not so much change in the future. It is even possible that under certain circumstances the gender pay gap could begin to widen, returning to levels of an earlier period. While we cannot choose among these options with certainty, it may be instructive to consider each of the factors that we have identified as influencing the gender pay gap and consider the possible future course of each and its likely impact on the pay gap.

One of the factors influencing the trends in the gender pay gap is overall trends in wage inequality. Rising wage inequality, to the extent that it results from increasing returns to skills like work experience that women have less of than men, on average, is expected to widen the gender pay gap, all else equal. In this respect, it has been noted that wage inequality increased less during the 1990s than during the 1980s (Katz & Autor, 1999). If this tapering off in the trend towards rising inequality should continue into the future, the negative effect of this factor on the pace of convergence in the gender pay gap will be small.

On the other hand, to the extent that rising wage inequality was due to demand shifts that favored women relative to men, it may be hypothesized that such shifts, and the relative advantage they may have given women

relative to men, have also tapered off and are likely to be dampened in the future as well. This is suggested by the fact that the shedding of blue collar, manufacturing jobs was particularly pronounced in the 1980s. A closely related development, deunionization, which also disadvantaged men to a greater extent than women, is likely to occur at a slower pace in the future as unionization rates in the private sector have reached single digits, giving little scope for substantial future declines, and public sector unionization remains relatively stable. While demand shifts favoring women may have slowed, so too has the growth in the supply of women to the labor market. If this slower growth in supply continues into the future, it may mean that demand- and supply-side shifts offset each other and thus, taken together, do not have much effect on convergence in the gender pay gap.

Although overall female labor force participation increased modestly in the 1990s, welfare reforms and other government policies spurred an increase in employment among single mothers (see, for example, Meyer & Rosenbaum, 2001). The growth in participation among single heads, who tend on average to be less well educated than other women, could also have slowed wage convergence by shifting the composition of the female labor force toward low-wage women. We did indeed find some evidence consistent with this in our earlier work (Blau & Kahn, 2006), though this factor does not appear to be the main reason for the slowing convergence in the gender wage gap in the 1990s. Thus it seems unlikely that a further entry of single mothers into the labor force in the future will have a large impact on the *aggregate* gender pay gap.

Moving toward the more traditional factors of women's relative qualifications and the possibility of labor market discrimination against them, there is little reason to expect large changes here either. The flattening

of the growth in women's labor force participation rates, if it continues, suggests that large increases in women's work experience and labor force commitment are unlikely, although this statement must be qualified somewhat since, as we have explained, trends in the average experience of women cannot be inferred directly from changes in participation rates. Similarly, now that women comprise the majority of college students, further large gains in the relative educational attainment of women appear unlikely, though there is room for continued reductions in the gender differences in college major and at the graduate level in professional schools and Ph.D. programs in many fields.

Turning to labor market discrimination, now that the most open and egregious forms of sex discrimination have been greatly reduced or eliminated and discrimination increasingly becomes more subtle and possibly even unconscious, future large declines in discrimination in the labor market may become more difficult to attain. In addition, the decreases in statistical discrimination that we hypothesized as occurring in response to women's increasing labor force attachment can be expected to slow as increases in women's attachment also slow. However, there seems room for some further decrease in statistical discrimination as the profound changes in gender roles that have already occurred continue to percolate through the labor market and the larger society and as additional changes continue to occur, albeit at a slower pace than in the past. And it is likely that even subtle barriers do change as women increasingly enter new areas and achieve success at higher levels. Putting this somewhat differently, while the glass ceiling may not have broken completely, it is showing a lot of cracks and is likely to show more and more cracks as time goes on.

Taking all these factors into account, our best guess is that we are going to have fur-

ther changes in the direction of convergence, but most probably at a slower pace. Our own view is that one development that is extremely unlikely is that we will see a reversal of the gains in relative wages and labor force participation women have experienced over the past 25 to 30 years. We do not expect a substantial widening of the male/female pay gap or labor force participation gap to occur. On the other hand, while precisely how much narrowing we will see in the future is an open question, the gender pay gap seems unlikely to vanish in the near term.

For one thing, women continue to confront discrimination in the labor market, and, although its extent seems to be decreasing, it seems unlikely to be completely eliminated soon. In addition, at least some of the remaining pay gap is surely tied to the gender division of labor in the home, both directly through its effect on women's labor force attachment and indirectly through its impact on the strength of statistical discrimination against women. Women still retain primary responsibility for housework and child care in most American families. However, this pattern has been changing as families respond to rising labor market opportunities for women that increase the opportunity cost of such arrangements. Further, policies that facilitate the integration of work and family responsibilities, both voluntary and government-mandated, have become increasingly prevalent in recent years. Employers are likely to continue to expand such policies as they respond to the shifting composition of the work force and a desire to retain employees in whom they have made substantial investments. In the longer run, the increasing availability of such policies will make it easier for women to combine work and family, and also for men to take on a greater share of household tasks.

Finally, while our principal concern has been with the pay of women relative to men,

Table 2. Mean Earnings of Education Groups Relative to High School Graduates, 1974 and 2003 (%)

Education	1974		2003	
	Men	Women	Men	Women
High school:				
1–3 years	88.9	85.3	75.9	76.6
4 years	100.0	100.0	100.0	100.0
College:				
1–3 years	113.6	112.6	122.8	119.5
4 or more years	155.0	147.2	211.3	190.4

Data refer to year-round, full-time workers 18 years of age and older. In 2003, median income for 1–3 years of college is computed as a weighted average of the medians for “some college, no degree” and “associate degree.”

Source: 2003: PINC04 Tables of the U.S. Census Bureau Current Population Survey, 2004 Annual Social and Economic Supplement, from http://ferrets.census.gov/macro/032004/perinc/new04_000.htm; 1974: U.S. Census Bureau Historical Income Tables – People, Table P–35, from www.census.gov/hhes/income/histinc/p35.html.

trends in inequality among women show a deterioration in the relative economic status of less educated women that is strikingly parallel to similar trends in the labor market for men (see Table 2). These developments for less educated women serve to underscore the widening gap between more and less skilled Americans of both sexes, as well as to emphasize its broad dimensions.

NOTES

1. Between 1980 and 1990, the average annual increase in the ratio was 1.14 percentage points for annual earnings and .74 percentage points for weekly earnings, while, between 1990 and 2000, it was only .16 percentage points for annual earnings and .42 percentage points for weekly earnings. Relative earnings growth in the early 2000s was more robust: between 2000 and 2003, the average annual increase in the ratio was .75 percentage points for annual earnings and 1.14 percentage points for weekly earnings.

2. One short-term factor could be the recession of 2001 and the relatively high unemployment rates that lingered in its aftermath. The demand for male workers tends to be more cyclically sensitive than that for female workers due to their greater concentration in blue-collar jobs and durable manufacturing industries.

3. If, as is likely, one is unable to completely control for nonwage job characteristics such as fringe

benefits, safety, or job security, then the residual may again not give an accurate estimate of the extent of discrimination against women. We cannot say a priori what the effect of such omissions is. On the one hand, to the extent that men are likely to work in less safe or less secure jobs than women, such analyses may overestimate discrimination. On the other hand, to the extent that men have higher fringe benefit levels, an analysis of wage residuals will understate discrimination. To some degree, these nonwage characteristics can be accounted for by controlling for industry and occupation, although as mentioned, these controls may also reflect exclusionary hiring practices.

4. In addition to gender differences in qualifications and the extent of discrimination, the gender earnings differential may also be affected by the self-selection of women and men into full-time employment and, more generally, into the labor force. In other words, those choosing to participate—or to work full-time—may differ from those outside the labor force or part-time workers in terms of both their measured and unmeasured characteristics. One possibility, for example, is that labor force participants are a positively selected group of those who have received higher wage offers. Similarly, full-time workers may be more highly qualified and more committed to market work. We in fact find that, at a point in time, the gender pay gap is smaller if only full-time workers are considered than if part-timers and nonparticipants are included; we examine the impact of changes in female and male selection into the labor force for trends in the gender pay gap (see below). Other research that has examined the earn-

ings differential for white and black women has found that, if self-selection is not accounted for, the race differential is underestimated; see Neal (2004).

5. The study controls for 19 occupations and 25 industries.

6. This quotation is from the Textbook Site for *Principles of Microeconomics*, 3rd ed., *Additional Topics*, "Using Economics to Explain Gender Pay Gaps," at http://college.hmco.com/economics/taylor/econ/3e/micro/students/add_topics/ch02_genderpay.html, accessed June 28, 2002. The summary is based on materials presented in West's Federal Supplement (1993).

7. See, for example, Sorensen (1990), Kilbourne, England, Farkas, Beron, and Weir (1994), and Macpherson and Hirsch (1995).

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