Women’s Work and Wages*

Francine D. Blau
Cornell University and Princeton University,
NBER, IZA and CESifo

and

Lawrence M. Kahn
Cornell University and Princeton University,
IZA and CESifo

November 2005

*S. N. Durlauf and L. E. Blume, The New Palgrave Dictionary of Economics, forthcoming, Palgrave Macmillan, reproduced with permission of Palgrave Macmillan. This article is taken from the author's original manuscript and has not been reviewed or edited. The definitive published version of this extract may be found in the complete New Palgrave Dictionary of Economics in print and online, forthcoming.
Women’s work and wages

Over the past twenty-five years, the gender wage gap has fallen in most economically advanced countries, although a gender wage differential remains in all countries. While labor market outcomes for men and women may vary across a number of dimensions, economists have particularly focused on analyzing gender differences in wages. This emphasis reflects a number of factors. The wage is of fundamental importance as a major determinant of economic welfare for employed individuals, as well as of the potential gain to market work for those not currently employed. Further, it affects decisions ranging from labor supply to marriage and fertility, as well as bargaining power and relative status within the family.

This article begins with an overview across a number of economically advanced countries of labor force participation and earnings differences between men and women in the labor market and delineates the recent trends. We then consider the explanations that have been offered for the gender wage gap at a point in time as well as for changes in the gender gap over time and differences in its extent across countries. Next, we consider the empirical evidence in support of various explanations. We conclude with some thoughts about future prospects for the gender wage gap.

Overview of Gender Differences in Labor Force Participation and Wages

Although the focus of this article is on the gender wage gap, it is useful to consider the evolution of labor force participation rates by gender. Women’s rising labor participation implies that women’s wage gains, discussed below, apply to an increasing share of the female population. In addition, changing female participation can mean that the qualifications and experience of the typical employed woman may be changing as well. To the extent that women’s rising participation is associated with rising labor force attachment of women over the life cycle, the average level of labor market experience of women will eventually increase. Changing participation rates may also be associated with changes in labor force selectivity of
women, depending on the relative qualifications of entrants and incumbents. And these factors in turn may help us explain the evolution of the gender wage gap. Table 1 shows that across ten economically advanced countries, women’s labor force participation rates rose steadily between 1979 and 2000, both absolutely and relative to men, with a faster increase in the 1980s than the 1990s. For example, on average, women were 64% as likely as men to be in the labor force in 1979; by 1990, this ratio had risen to 77% and, by 2000, it was 83%. Throughout this period, Scandinavian women had especially high participation rates.

<Table 1 here>

Table 2 shows female to male pay ratios from the OECD across the same ten countries shown in Table 1. In some cases the data are available as weekly or monthly earnings of full-time workers (Panel A), and in others as annual earnings of full-time, year-round workers (Panel B). As may be seen in the table, women uniformly have lower wage rates than men. However, in all but one case, the gap fell between 1980 and 2000. (The exception is Sweden where the pay gap rose by one percentage point from an already very low level in 1980.). For example, between 1980 and 2000, the ratio of women’s to men’s wages rose from an average of 69 to 77 percent among the countries in Panel A, and from an average of 78 to 83 percent among countries in Panel B. The gender wage gap is especially small in France, Australia, Sweden, and New Zealand. The United States had one of the larger gaps in 1980, with only Japan having a lower female to male wage ratio. Over the 1980 to 2000 period, the gender wage gap fell by more, both absolutely and relatively, in the United States than in any of the other countries shown. Nonetheless, even in 2000, the gender wage gap remained relatively high in the United States.

---

1 The entries in Table 2 are intended to show the price of labor; the definition used reflects data availability.  
2 Current Population Survey data show that, in the United States, the gender gap in annual pay for full-time, year-round workers is slightly higher than the gender gap in weekly earnings for full-time workers. If this pattern holds for other countries, then the gap in weekly wages for the countries in Panel B may be even smaller than the figures shown in Table 2, which already indicate relatively small gender pay gaps.
States, as other wage differentials such as those for education, cognitive ability or union membership have historically been (Blau and Kahn 2002 and 2005b). As we shall see, the pattern of international differences in the gender wage gap will be useful in shedding light on the impact of labor market institutions on the gender gap. This is the case, because there are very large differences in the types of such institutions across the economically advanced countries that have consequences for the size of the gender wage gap.

<Table 2 here>

**Explanations for the Gender Wage Gap**

Traditionally, economic analyses of the gender wage gap have focused on what might be termed gender-specific factors, that is, (i) gender differences in qualifications and (ii) differences in the labor market treatment of men and women (or labor market discrimination). More recently, following on the work of Juhn, Murphy and Pierce (1991) on trends in race differentials, some advances have been made by considering the gender wage gap and other demographic wage differentials in the context of the overall structure of wages. Wage structure is the array of prices determined for labor market skills and the rewards to employment in particular sectors. In addition, gender specific factors and wage structure can interact to affect the gender wage gap.

**Gender-specific factors**

Gender differences in qualifications have primarily been analyzed within the human capital model (Mincer and Polachek 1974). Given the traditional division of labor by gender in the family, women tend to accumulate less labor market experience than men. Further, anticipating shorter and more discontinuous work lives, women have lower incentives to invest in market-oriented formal education and on-the-job training. Their resulting smaller human capital investments will lower their earnings relative to those of men. Working in a similar
direction is Becker's (1985) model in which the longer hours women spend on housework lower the effort they put into their market jobs compared to men and hence reduce their wages.

Gender differences in occupations are also expected to result if women choose occupations for which on-the-job training is less important. Women may especially avoid jobs requiring large investments in firm-specific skills (i.e., skills which are unique to a particular enterprise), because the returns to such investments are reaped only as long as one remains with a particular employer. At the same time, employers may also be reluctant to hire women for such jobs because they bear some of the costs of firm-specific training (see the discussion of statistical discrimination below).

To the extent that gender differences in outcomes are not fully accounted for by productivity differences derived from these and other sources or by compensating differences in nonwage job characteristics such as risk of injury, models of labor market discrimination offer an explanation. In Becker's (1957) model, discrimination is due to the discriminatory tastes of employers, co-workers, or customers. Alternatively in models of statistical discrimination (e.g., Aigner and Cain 1977), which assume a world of uncertainty, differences in the treatment of men and women arise from differences between the two groups in the expected value of productivity or in the reliability with which productivity may be predicted. In either case, gender differences in wages or occupations may result. Another aspect of interest is the relationship between occupational segregation and a discriminatory wage gap formulated in Bergmann's (1974) overcrowding model. She argues that discriminatory exclusion of women from “male” jobs results in an excess supply of labor in “female” occupations, depressing wages there for otherwise equally productive workers. The same wage outcomes could also be observed if women voluntarily exclude themselves from male jobs due to gender differences in preferences for the jobs themselves or for various attributes of the jobs (e.g., long hours, necessity for travel).

Two recently proposed models of discrimination suggest alternative motivations for male employees to discriminate against female coworkers than the personal prejudices assumed in the Becker model, particularly for resisting the introduction of women into traditionally male
occupations. In Akerlof and Kranton (2000), occupations are associated with societal notions of “male” and “female,” leading men to resist the entry of women due to the loss in male identity (or sense of self) that this would entail. In Goldin (2002), the entry of women is viewed as reducing the prestige of the occupation, based on perceptions that women are, on average, less productive.

An additional gender-specific factor potentially contributing to the observed gender wage gap is labor force selectivity. While one would ideally like to have evidence on the potential wage offers available to each individual in the population, we typically observe wages only for those who are actually employed. If there are unobserved differences in skills or labor market prospects between the nonemployed and the employed, focusing on measured wages may give a misleading picture of the wage offers received by women relative to men, both at a point in time and for trends over time and differences across countries.³

**Wage structure**

The human capital model suggests that men and women tend to have different levels of labor market qualifications (especially work experience) and to be employed in different occupations and perhaps in different industries. Discrimination models too suggest that women may be segregated into different sectors of the labor market. This implies that the overall returns to skills and the size of premia for employment in particular sectors potentially play an important role in determining the gender wage gap. All else equal, the larger the returns to skills and the larger the rents received by individuals in favored sectors, the larger will be the gender wage gap. The framework provided by wage structure is particularly useful in analyzing changes over time in gender differentials or differences across countries in gender gaps.

**Interactions between gender-specific factors and wage structure**

³ This problem was first studied in detail by Heckman (1979) in the context of estimating labor supply models.
While gender specific factors and wage structure each potentially play a distinct role in affecting the gender wage gap, they are likely to interact, making it sometimes difficult to disentangle their separate effects. For example, as discussed in more detail below, since the 1970s, the labor market returns to skills such as education, specialized training and experience have risen in many countries, likely due in part to technological change, including computerization. To the extent that the prices of skills for which women have a relative deficit have risen, such changes in wage structure will raise the gender wage gap. However, technological change itself is not likely to have gender neutral effects on labor demand, given occupational and industrial segregation patterns by gender. So, for example, it is likely that computerization has reduced the demand for blue collar production labor and therefore lowered the relative demand for sectors where men are disproportionately represented (Weinberg 2000; Autor, Levy and Murnane 2003).

A final set of factors complicating the breakdown of the gender wage gap into gender-specific factors and those related to the overall structure of wages is that women’s gains themselves may directly affect the dispersion of male wages, generally used as a proxy for overall wage structure. For example, Fortin and Lemieux (1998) present a model in which there is a fixed hierarchy of jobs. As women move up the hierarchy, they replace some men who previously would have had middle-level positions, bumping them down the hierarchy. Thus, increases in women’s human capital or reductions in employment discrimination against women may cause increases in male wage inequality. Topel (1994) makes a similar argument to the effect that high skill women compete with low skill men in the labor market and, thus, that increases in the supply of high skill women directly lower the real wages of low skill men and thereby raise male wage inequality.

**Evidence on Human Capital, Discrimination, and the Gender Wage Gap**

The typical approach to analyzing the sources of the gender wage gap is to estimate wage regressions specifying the relationship between wages and productivity-related characteristics
for men and women. The gender wage gap may then be statistically decomposed into two components: the first, due to gender differences in measured characteristics, and the second, which is "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 wage gap.

One problem with this approach is that evidence for discrimination relies on the existence of a residual gender wage gap, which cannot be explained by gender differences in measured qualifications. This accords well with the definition of labor market discrimination, i.e., pay differences between groups that are not explained by productivity differences, but may also reflect group differences in unmeasured qualifications. If men are more highly endowed with respect to these omitted variables then we would overestimate discrimination. And, conversely, to the extent that women are more highly endowed with respect to the omitted variables, discrimination would be underestimated. Another case in which discrimination would be underestimated would be if some of the factors controlled for (e.g., occupation or tenure with the employer) themselves reflect the impact of discrimination.

Another challenge to empirically decomposing the gender wage gap into its constituent parts is the existence of feedback effects. The traditional division of labor in the family may influence women’s market outcomes through its effects on their acquisition of human capital and on rationales for employer discrimination against them. But it is also the case that, by lowering the market rewards to women’s human capital investments and labor force attachment, discrimination may reinforce the traditional division of labor in the family (e.g., Weiss and Gronau 1981). Even small initial discriminatory differences in wages may cumulate to large ones as men and women make human capital investment and time allocation decisions on the basis of them.

---

4 While it would be preferable to analyze total compensation (including nonwage benefits and compensating differentials for job amenities), virtually all studies focus on money wages since data on total compensation are generally not available.
Representative findings from statistical analyses

Representative findings from analyses of this type may be illustrated by results from three recent studies of the gender wage gap in the United States (Blau and Kahn 2004), Denmark (Datta Gupta and Oaxaca forthcoming), and Sweden (Edin and Richardson 2002). Each of these studies uses data bases that have information on actual labor market experience, a variable that is crucial for the analysis and is often not available in nationally representative data sets.

For the United States, Blau and Kahn (2004) found a female-male ratio for average hourly earnings of 79.7 percent in 1998. In light of the issues discussed above, they considered results when only human capital variables (i.e., education and labor market experience) and race were taken into account, and results additionally controlling for occupation, industry and unionism. While gender differences in educational attainment were small, the gender gap in full-time work experience was substantial. Controlling for human capital, women earned 81 percent of what men earned; the gender ratio rose to 91 percent when industry, occupation and union status were additionally controlled for. For Denmark, Datta Gupta and Oaxaca (forthcoming) found an unadjusted gender ratio of 81.1 percent in 1995. This rose to 83.2 percent controlling for schooling and experience, and to 86.2 percent additionally controlling for industry, occupation and region. Edin and Richardson (2002) found qualitatively similar results for Sweden in 1991. Thus, in all three countries measured characteristics explained some but not all of the gender wage gap.

The studies such as those discussed above suggest that gender differences in human capital (especially experience) can be an important factor helping to account for the gender wage gap at a point in time. In the United States, improvements in women’s relative experience were an important factor in explaining the rise in women’s relative wages during the 1980s (Blau and Kahn 1997 and 2004; O’Neill and Polachek 1993), while increases in women’s relative experience and education both contributed to female wage gains in the 1990s (Blau and Kahn 2004). And since 1980, the unexplained wage gap in the United States has fallen, a finding
consistent with a decline in discrimination or improvements in women’s unmeasured characteristics, and also, as we shall see below, with shifts in relative demand favoring women. Sample selectivity can also affect measured gender wage gaps. For example, using different methodologies, Blau and Kahn (2004) and Mulligan and Rubinstein (2005) both find a role for selectivity in explaining these wage trends.

**Additional evidence on discrimination**

A problem with the types of statistical analyses just discussed is that evidence of discrimination is based on a residual or unexplained gender wage gap that is susceptible to a variety of interpretations, of which labor market discrimination is only one. Two lines of empirical research on discrimination pursue alternative approaches which lend additional support to the finding of discrimination.

First are two studies that use an experimental approach. Neumark (1996) analyzed the results of a hiring “audit” in which male and female pseudo-job seekers were given similar résumés and sent to apply for waiter or waitress jobs at the same set of Philadelphia restaurants. In high-priced restaurants where earnings of workers are generally higher than in the other establishments, 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, Goldin and Rouse (2000), examined the impact of the “natural experiment” in which major symphony orchestras in the United States adopted “blind” auditions. In a blind audition, a screen is used to conceal the identity of the candidate. Using data from actual auditions, the authors found that the screen substantially increased the probability that a woman would advance out of preliminary rounds and be the winner in the final round. Goldin and Rouse (2000) used their parameter estimates to conclude that the switch to blind auditions can explain between 25 and 46 percent of the increase in the percentage female in the top five symphony orchestras in the United States from less than 5 percent of all players in 1970 to 25 percent in 1996.
A second source of additional evidence on discrimination is provided by studies that examine predictions of Becker's (1957) discrimination model and obtain results which are consistent with the model and hence with discrimination against women. Becker and others have pointed out that competitive forces should reduce or eliminate employer 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 (1997) found that, among plants with high levels of product market power, those employing relatively more women were more profitable. Similarly, Black and Strahan (2001) report that with the deregulation of the banking industry beginning in the mid-1970s, the gender wage gap in banking declined. And Black and Brainerd (2004) found that increasing vulnerability to international trade reduced apparent gender wage discrimination in concentrated industries, again as predicted by the Becker model.

Possible sources of the unexplained gender wage gap

While there appears to be evidence from a variety of approaches that is consistent with discrimination against women in the labor market, this does not mean that the full unexplained gap estimated in traditional approaches may be attributed to discrimination. Some of the residual gap may be due to the impact of childbearing on women's wages. This is not a factor that can be examined simply by including a control for number of children in a wage regression, since the coefficient on children variables may be influenced by self-selection into motherhood and the endogeneity of number of children. Research that addresses some of these issues suggests a negative effect of children on wages, even when labor market experience is controlled for (e.g., Waldfogel 1998). This may reflect that, in the past, the birth of a child often meant that a woman withdrew from the labor force entirely, 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.

Another possible source of the unexplained wage gap is noncognitive skills/traits or what Fortin (2005) terms “soft factors.” For example, experimental evidence suggests gender differences in competitiveness (e.g., Gneezy, Niederle, and Rustichini (2003)), and negotiating skills (Babcock and Laschever 2003). Fortin (2005) examines the impact of these and a number of other noncognitive traits and attitudes in a wage regression context. While such findings are informative in elucidating the omitted factors that lie behind the unexplained gap in traditional wage equations, as Fortin acknowledges, the coefficients on soft factors in a wage equation cannot necessarily be given a causal interpretation. Both wages and attitudes, for example, may be determined by the same exogenous factor. And, as in the case of the traditional productivity proxies discussed above, there may be important feedback effects from differential treatment in the labor market to noncognitive traits. So, for example, income expectations may influence wages through negotiating behavior or effort, but the source of women’s lower income expectations could be, at least in part, anticipation of labor market discrimination. Nor is it clear that all such omitted factors favor men. Borghans, ter Weel and Weinberg (2005) argue for a female advantage in interpersonal interactions, which they proxy by altruism.

Just as the importance of gender differences in the traditional human capital variables may change over time, thus helping to account for the decline in the gender wage gap, so may the impact of noncognitive traits. In this regard, it is interesting that Fortin (2005) finds evidence that gender differences in work attitudes were much smaller in 2000 than in 1986. Further, Borghans, ter Weel and Weinberg (2005) find evidence of a growing importance of interpersonal interactions (in part due to increased computer use) in affecting wages that can help explain rapidly rising female relative wages in the 1980s as well as a slower rate of increase in the 1990s.

**The impact of policy**

Women’s relative skills and the degree of employer discrimination can be affected by
government policies directed at issues of combining work and family as well as equal employment opportunity laws. For example, many countries have enacted paid parental leave mandates which give parents who take time off to care for children or other relatives an entitlement to their jobs upon returning from the leave. While such policies may encourage firm-specific investments, thus raising women’s relative wages (since parental leave is much more likely to be taken by women than men), they may also encourage labor force withdrawal for longer periods of time than otherwise, reducing women’s accumulation of experience. Mandated paid leaves, particularly of long duration, may also diminish women’s opportunities by increasing employer costs of hiring women and hence providing incentives to discriminate against them. Thus, the effect of parental leaves on the gender wage gap is theoretically ambiguous. Ruhm (1998) in fact finds in a study of 16 western industrialized countries that, other things equal, short mandated paid parental leaves lead to higher relative wages for women, while longer leaves lead to a higher gender wage gap. These results suggest that a number of offsetting factors may be at work, with the positive impact dominating for short leaves and the negative effect dominating for long periods of mandated parental leave.

While virtually all industrialized countries have enacted legislation outlawing employment discrimination against women, in some countries governments intervention is more dramatic than others. The major approach in the United States involves enforcement of antidiscrimination legislation, including equal employment opportunity as well as equal pay for equal work. Further, under some circumstances, affirmative action, or “pro-active steps . . . to erase differences between women and men, minorities and nonminorities, etc.” (Holzer and Neumark, p. 484), is also required or voluntarily adopted by employers. There is some evidence for the United States of a positive effect of government antidiscrimination policies on women’s earnings and occupations. Studies focusing specifically on the impact of affirmative action also suggest modest employment and wage gains for women attributable to this program.  

“Comparable worth” or equal pay for work of equal value (i.e., even if men and women are doing different jobs) constitutes a stronger form of government intervention. In evaluating the impact of such a policy it is interesting to look at studies focusing on Australia, which has adopted government mandates in this area nationwide, and the United States, where such policies are limited to selected state or local government employees (Gregory and Duncan 1981; Killingsworth 1990; O’Neill, Brien and Cunningham 1989). One would expect that if such policies lower the gender wage gap, they might also lead to a decrease in women’s relative employment due to employer demand effects. Gregory and Duncan (1981) in fact find such a pattern: the gender wage gap fell dramatically immediately after the Australian tribunal began implementing comparable worth policies in the early 1970s, but female employment grew less rapidly than one would have predicted in the absence of the wage intervention. Similarly, in studies of the impact of the comparable worth policies in state governments in the United States, small positive wage and negative employment effects for women have been found (Killingsworth 1990; O’Neill, Brien and Cunningham 1989).

While these results for the impact of comparable worth in Australia and the United States on women’s employment are consistent with the existence of competitive labor markets, to the extent that the labor market is characterized by monopsony, government-mandated wage increases for women need not result in a reduction in women’s employment levels. Manning (1996) interprets the impact of the U.K. Equal Pay Act of 1970 and the Sex Discrimination Act of 1975 in this light. Specifically, he shows that the Act led to a major reduction in the gender wage gap in the U.K. with no apparent employment losses for women: after the legislation, wage changes and employment changes within industries were strongly positively related for women but much less so for men.

Differential monopsony power facing men and women could help to explain the existence of the gender wage gap (Madden 1973) in general, as well as Manning’s (1996) results for the policy intervention. For this explanation of the wage gap to make sense, women’s supply of labor to the firm must be less wage elastic than men’s, giving employers greater monopsony
power over women than men. This might seem counterintuitive at first, in that there is clear
evidence that women have a *larger* own-wage elasticity of labor supply to the labor market than
men, although, in the United States, the gender difference has been decreasing as women’s
elasticity declined over the last twenty years or so (Blau and Kahn 2005a and Heim 2004).
However, a variety of factors could still potentially result in women having a smaller
responsiveness to wage changes at the firm level. Perhaps the most intriguing possibility is
discrimination itself. Black (1995) develops a model in which search costs give employers a
degree of monopsony power. If there is discrimination against women, women will face higher
search costs than men, increasing employers’ monopsony power over them.

Evidence on gender differences in labor supply at the firm level is mixed. On the one
hand, Viscusi (1980), Blau and Kahn (1981) and Light and Ureta (1992) all find that for the
United States, women’s quit rates are at least as wage responsive as men’s, suggesting that the
monopsony model may have limited application in the United States. On the other hand, Barth
and Dale-Olsen (1999) found that men’s turnover in Norway is more wage-elastic than women’s.
Thus, Norwegian employers could potentially exercise differential monopsony power over
women. Of course, the degree to which Norway’s centralized wage-setting system would allow
this to take place is an empirical question (Kahn 1998).

**Evidence on the Impact of Wage Structure on the Gender Wage Gap**

The impact of the wage structure on the gender wage gap is best studied in a comparative
ccontext. Since wage structure may differ across countries and change over time, investigations
of the impact of wage structure have focused on (i) international differences in the gender wage
gap at a point in time, and (ii) changes in the gender wage gap in one country over time. A
useful framework for analyzing the impact of wage structure on demographic wage differentials
was devised by Juhn, Murphy and Pierce (JMP) (1991) in their analysis of changes in black
workers’ relative wages in the United States. Blau and Kahn (e.g., 1996b and 1997) have
adapted their framework to studying international differences in the gender wage gap as follows.
Suppose we have for male worker i in country j the following wage equation:

\[(1) \quad Y_{ij} = B_j'X_{ij} + e_{ij} = B_j'X_{ij} + F^{-1}(\theta_{ij}),\]

where \(Y\) is log of wages, \(B\) is a coefficient vector, \(X\) is a vector of productivity-related characteristics, \(e\) is a disturbance term, \(F^{-1}(\cdot)\) is the inverse cumulative distribution function of male log wage residuals, and \(\theta\) is individual i’s percentile in the male residual distribution.

Estimating equation (1) separately for each of two countries, differences in the gender wage gap may be decomposed into components due to intercountry differences in: a) gender differences in the \(X\) variables; b) the male wage coefficients \(B\); c) women’s position in the male residual distribution (\(\theta\)); and d) the residual distribution \(F(\cdot)\). Components (a) and (c) represent gender-specific factors: intercountry differences in women’s relative measured productivity (component a) and in women’s placement in the distribution of male wage residuals (component c). The latter can represent discrimination or unmeasured productivity differences. Components (b) and (d) represent the potential effects of wage structure: measured prices (component b) and the prices of unmeasured skills or rents due to unmeasured representation in favorable sectors (component d). Note that the sum of components (c) and (d) corresponds to the unexplained gap in a traditional decomposition of the gender wage gap and component (c) may be viewed as the unexplained gap adjusted for changes in unmeasured prices. For example, if the return to experience, which is part of the \(B\) vector, is higher in one country than another, then this difference will contribute to a higher gender wage gap in the first country, since women on average have less experience than men. Or suppose that \(X\) does not include data on the specific firm in which a worker is employed. If a country has especially high interfirm wage differentials (part of the residual wage distribution \(F(\cdot)\)) and if women are employed in low wage firms on average, then this unmeasured price effect will raise that country’s gender wage gap. The same

---

\(^6\) This interpretation of the residual has been questioned by Suen (1997). For further discussion of this issue, see the discussion below re: the assumption in the JMP decomposition that male prices and male residuals are relevant indicators of the prices facing women in the labor market. See also, Blau and Kahn (2003).
decomposition can also be used to explain changes in the gender wage gap over time within a country.

This decomposition has been used by Blau and Kahn (1992 and 1996b) and Kidd and Shannon (1996) to study international differences in the gender wage gap at a point in time. For example, Blau and Kahn (1996b) compared the US gender wage gap in the late 1980s to that in nine other countries (Australia, Austria, West Germany, Hungary, Italy, Norway, Sweden, Switzerland, and the United Kingdom). They found that, on average, the ratio of women’s to men’s pay was about 4.3 percentage points lower in the United States than the other countries: 65.4 percent vs. 69.7 percent. US women had better measured characteristics and placed higher in the distribution of male residuals than women in the other countries, suggesting that gender-specific factors could not explain the reasons for the higher US gender wage gap. However, measured and unmeasured prices together had large effects raising women’s relative wages in the other countries compared to the United States. Wage structure was thus sufficient to explain more than the full amount of the difference between the US gender wage gap and that in other countries. Blau and Kahn (1992 and 1996b) interpreted this pattern as reflecting the impact of international differences in labor market institutions. In the other countries, unions cover a much larger portion of the labor market than in the United States and wage-setting is much more centralized. Centralized collective bargaining tends to reduce wage differentials through the negotiation of relatively high wage floors, which would raise the relative wages of anyone near the bottom of the distribution, including women (Blau and Kahn 1996a).

Kidd and Shannon (1996) also found an important role for wage structure in their study of the gender wage gaps in Australia and Canada for 1989-90. Specifically, the gender gap in hourly wages was about .14 log points lower in Australia than in Canada. They found that 0.05 to 0.09 log points of this difference was due to the combined effects of observed and unobserved prices. This result is similar to that in Blau and Kahn (1992 and 1996b) in that Australia has much higher coverage by collective bargaining than Canada.
The JMP decomposition has also been used to study the impact of wage structure on changes in the gender wage gap over time within a country. For example, in Sweden between 1968 and 1974, the trade union movement engineered a major compression of wages. Edin and Richardson (2002) used the JMP decomposition to find that wage structure, especially unobserved prices, contributed to a reduction of the gender wage gap during this period. Moreover, Datta Gupta and Oaxaca (forthcoming) used a version of the JMP decomposition to study changes in the Danish gender wage gap between 1983 and 1995. This was a period of increased decentralization of the wage determination process, a development that is expected to lead to rising labor market prices and therefore a rising gender wage gap. The authors indeed find that the gender wage gap in Denmark increased during this period and that most of the increase can be accounted for by rising unmeasured prices.

Finally, this approach has been applied to understanding the trends in the gender wage gap in the United States. Blau and Kahn (1997) used the JMP decomposition to study the apparent paradox of a substantial decrease in the gender wage gap in the United States during the 1979 to 1988 period, a time of rising skill prices. They find that women were able to overcome the negative effects of these price changes by improving their measured human capital and by moving up the distribution of male residuals. The authors further note that the process leading to higher skill prices in the United States might not have been gender-neutral. Specifically, it is likely that part of the explanation for this development involves skill-biased technical change in which the demand for white collar labor rose relative to blue collar labor, a change that, given gender differences in occupational distributions, in effect raises the demand for women workers. Thus, while skill prices were rising, contributing to a reduction in women’s relative wages, developments such as computerization and perhaps outsourcing of production labor disproportionately lowered the demand for male labor (Welch 2000; Weinberg 2000; Autor, Levy and Murnane 2003). In the context of the JMP decomposition, these changes in labor demand would be reflected in higher placement of women in the distribution of male residuals (leading to a decrease in the conventional unexplained gender wage gap). As noted previously,
convergence in the gender wage gap in the United States slowed during the 1990s. Using the JMP decomposition, Blau and Kahn (2004) found that the major reason for the slowdown was the considerably smaller narrowing of the unexplained gender wage gap in the 1990s compared to the 1980s. This raises the possibility that the types of demand shifts favoring women that we have outlined here were smaller in the 1990s than in the 1980s, and Blau and Kahn present some evidence that is consistent with this as at least a partial explanation for the smaller decrease in the unexplained gender gap in the latter period.

The JMP decomposition assumes that male prices and male residuals are relevant indicators of the prices facing women in the labor market. Some support for this assumption is provide by the fact that wage coefficients and residual distributions have changed similarly for men and women over time in the United States and are similar to each other within countries at a point in time (Blau and Kahn 2002). But it is possible to directly test whether male wage compression leads to a smaller gender wage gap, and Blau and Kahn (2003) have done so by compiling a microdata set for 22 countries over the 1985-94 period. They find, looking across countries, that the gender wage gap is positively affected by a country’s male skill prices (i.e., level of male wage inequality), as well as by the relative net supply of women (i.e., supply net of demand). A likely interpretation is that more compressed male wages are an indicator of smaller wage differentials in general, as suggested above in our discussion of centralized wage-setting institutions.7 Bolstering this interpretation is the authors’ further finding that, other things equal, greater coverage by collective bargaining reduces the gender wage gap. It thus appears that high wage floors negotiated by unions serve to lower the gender wage gap.

If labor markets are competitive, then union-negotiated wage floors should lower female relative employment. And this is precisely what Bertola, Blau and Kahn (2002) find in a study of relative employment in 17 countries over the 1960-1996 period. Specifically, they find that

---

7 Fortin and Lemieux’s (1998) model in which a smaller gender wage gap causes an increase in male wage inequality suggests that Blau and Kahn’s (2003) finding of a positive effect of male inequality on the gender wage gap may be biased downward.
greater coverage by highly centralized unions lower female employment and raise female unemployment compared to men’s. This suggests that unionization can raise women’s relative wages at the expense of lowering their employment. This in turn suggests that Manning’s (1996) evidence in favor of monopsony in the United Kingdom may describe an exceptional case in the OECD.

Future Prospects

While it is difficult to speculate about the future, Tables 1 and 2 do suggest some convergence across countries in both female labor force participation (absolutely and relative to men) and in the gender wage gap. For example, calculations based on the data in Tables 1 and 2 indicate that the standard deviation across countries in the ratio of women’s to men’s labor force participation rates fell from 0.128 in 1980 to 0.072 in 2000; and that the standard deviation of the gender wage ratio fell steadily from 0.086 in 1980 to 0.066 by 2000. While the gender wage ratio appears to be converging at around 80% for several of the countries in Table 1, further changes are not precluded. In the United States, as mentioned earlier, women’s education has been rising relative to men’s, a trend that shows no sign of ending. Technological change, which has likely raised women’s relative wages through demand effects, will probably continue and could even accelerate. Going against these trends is the likely continued decentralization of wage-setting institutions in many Western countries, spurred in part by globalization (Katz 1993).

Francine D. Blau
Lawrence M. Kahn
References


Table 1: Labor Force Participation Rates by Gender (ages 15-64)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>87.6</td>
<td>50.3</td>
<td>0.574</td>
<td>84.4</td>
<td>61.5</td>
<td>0.729</td>
<td>81.9</td>
<td>65.4</td>
<td>0.799</td>
</tr>
<tr>
<td>Finland</td>
<td>82.2</td>
<td>68.9</td>
<td>0.838</td>
<td>79.6</td>
<td>73.5</td>
<td>0.923</td>
<td>76.4</td>
<td>72.1</td>
<td>0.944</td>
</tr>
<tr>
<td>France</td>
<td>82.6</td>
<td>54.2</td>
<td>0.656</td>
<td>75.0</td>
<td>57.2</td>
<td>0.763</td>
<td>74.4</td>
<td>61.7</td>
<td>0.829</td>
</tr>
<tr>
<td>Germany</td>
<td>84.5</td>
<td>49.6</td>
<td>0.587</td>
<td>79.0</td>
<td>55.5</td>
<td>0.703</td>
<td>78.9</td>
<td>63.3</td>
<td>0.802</td>
</tr>
<tr>
<td>Japan</td>
<td>89.2</td>
<td>54.7</td>
<td>0.613</td>
<td>83.0</td>
<td>57.1</td>
<td>0.688</td>
<td>85.2</td>
<td>59.6</td>
<td>0.700</td>
</tr>
<tr>
<td>Netherlands</td>
<td>79.0</td>
<td>33.4</td>
<td>0.423</td>
<td>79.7</td>
<td>52.4</td>
<td>0.657</td>
<td>83.9</td>
<td>65.7</td>
<td>0.783</td>
</tr>
<tr>
<td>New Zealand</td>
<td>87.3</td>
<td>45.0</td>
<td>0.515</td>
<td>83.0</td>
<td>63.2</td>
<td>0.761</td>
<td>83.2</td>
<td>67.5</td>
<td>0.811</td>
</tr>
<tr>
<td>Sweden</td>
<td>87.9</td>
<td>72.8</td>
<td>0.828</td>
<td>86.7</td>
<td>82.5</td>
<td>0.952</td>
<td>81.2</td>
<td>76.4</td>
<td>0.941</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>90.5</td>
<td>58.0</td>
<td>0.641</td>
<td>88.3</td>
<td>67.3</td>
<td>0.762</td>
<td>84.3</td>
<td>68.9</td>
<td>0.817</td>
</tr>
<tr>
<td>United States</td>
<td>85.7</td>
<td>58.9</td>
<td>0.687</td>
<td>85.6</td>
<td>67.8</td>
<td>0.792</td>
<td>83.9</td>
<td>70.7</td>
<td>0.843</td>
</tr>
<tr>
<td>Average</td>
<td>85.7</td>
<td>54.6</td>
<td>0.636</td>
<td>82.4</td>
<td>63.8</td>
<td>0.773</td>
<td>81.3</td>
<td>67.1</td>
<td>0.827</td>
</tr>
</tbody>
</table>

For 1990 and 2000, ages are 16-64 for Sweden, the United Kingdom and the United States. Germany is defined as West Germany in 1979 and 1990 and unified Germany in 2000.
### Table 2: Female to Male Ratios, Median Full Time Earnings

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>0.813</td>
<td>0.818</td>
<td>0.828</td>
<td>0.016</td>
<td>1.9%</td>
</tr>
<tr>
<td>W. Germany</td>
<td>0.705</td>
<td>0.738</td>
<td>0.793</td>
<td>0.088</td>
<td>12.5%</td>
</tr>
<tr>
<td>Japan</td>
<td>0.583</td>
<td>0.594</td>
<td>0.654</td>
<td>0.071</td>
<td>12.2%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>0.733</td>
<td>0.773</td>
<td>0.815</td>
<td>0.082</td>
<td>11.2%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0.647</td>
<td>0.688</td>
<td>0.761</td>
<td>0.113</td>
<td>17.5%</td>
</tr>
<tr>
<td>United States</td>
<td>0.634</td>
<td>0.715</td>
<td>0.748</td>
<td>0.114</td>
<td>17.9%</td>
</tr>
<tr>
<td>Average</td>
<td>0.686</td>
<td>0.721</td>
<td>0.766</td>
<td>0.081</td>
<td>11.8%</td>
</tr>
</tbody>
</table>

#### A. Weekly or Monthly Earnings, Full Time Workers

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>0.734</td>
<td>0.771</td>
<td>0.796</td>
<td>0.062</td>
<td>8.4%</td>
</tr>
<tr>
<td>France</td>
<td>0.803</td>
<td>0.847</td>
<td>0.905</td>
<td>0.103</td>
<td>12.8%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.744</td>
<td>0.750</td>
<td>0.783</td>
<td>0.039</td>
<td>5.3%</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.855</td>
<td>0.804</td>
<td>0.845</td>
<td>-0.010</td>
<td>-1.2%</td>
</tr>
<tr>
<td>Average</td>
<td>0.784</td>
<td>0.793</td>
<td>0.832</td>
<td>0.048</td>
<td>6.2%</td>
</tr>
</tbody>
</table>

#### B. Annual Earnings, Full Time, Year Round Workers


Notes: All earnings are gross of taxes, except France, which reports net earnings.