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Wage Structure and Gender Earnings Differentials: an International Comparison

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Using microdata to analyse the gender pay gap in ten industrialized nations, we focus on the role of wage structure—the prices of labour market skills—in influencing the gender gap. We find wage structure enormously important in explaining why the US gender gap is higher than that in most other countries. We conclude that the US gap would be similar to that in Sweden and Australia (the countries with the smallest gaps) if the United States had their levels of wage inequality. This finding reflects the larger penalty in the United States for those with low skill levels or employed in low-wage sectors.

INTRODUCTION

Despite in many cases dramatic reductions in the male–female pay gap since the 1950s, gender differentials persist in all industrialized nations. However, the size of the gender gap varies considerably across countries. Published data suggest that, by the late 1980s, the Scandinavian countries, France, Australia and New Zealand had female–male hourly pay ratios of 80%–90%, while other countries in Western Europe and the United States had pay ratios of roughly 65%–75%. The United States was amoung the countries with the largest differentials (OECD, ILO, USBLS). This paper uses microdata to analyse international differences in the gender pay gap among a sample of ten industrialized nations. We focus particularly on explaining the surprisingly low ranking of the United States in comparison with other industrialized countries. An advantage of an international perspective is that countries vary considerably with respect to governmental policies, women's relative labour market qualifications and wage-setting institutions. Such variability allows one to infer reasons for differences in the pay gap and, by implication, the impact of alternative government policies.

Empirical research on gender pay gaps has traditionally focused on the role of gender differences in qualifications and on differences in the treatment of otherwise equally qualified male and female workers (i.e. labour market discrimination). Analyses of trends over time in the gender differential within countries as well as inter-country comparisons of gender earnings ratios have tended to emphasize these types of gender-specific factors. An innovative feature of our study is to focus on the role of wage structure as an additional factor influencing the gender gap. To analyse the impact of wage structure, we adapt a framework developed by Juhn *et al.* (1991) to analyse trends over time in race differentials in the United States. Our findings suggest that labour market institutions that affect overall wage inequality have an extremely important effect on the gender earnings gap.

'Wage structure' describes the array of prices set for various labour market skills (measured and unmeasured) and rents received for employment in particular sectors of the economy. Research on gender-specific factors influencing

the pay gap suggests that men and women tend to have different levels of labour market skills and to be employed in different sectors. This implies a potentially important role for wage structure in determining the pay gap. For example, suppose that in two countries women have lower levels of labour market experience than men but that the gender difference in experience is the same in the two countries: if the return to experience is higher in one country, then that nation will have a larger gender pay gap. Or, as another example, suppose that the extent of occupational segregation by sex is the same in two countries but that the wage premium associated with employment in male jobs is higher in one country: then, again, that country will have a higher pay gap.

Skill prices can be affected by relative supplies, by technology (e.g. high-tech industries place a premium on highly trained workers), by the composition of demand or, as emphasized in this paper, by the wage-setting institutions of each country. Specifically, centralized wage-setting institutions, which tend to reduce inter-firm and inter-industry wage variation and are often associated with conscious policies to raise the relative pay of low-wage workers (regardless of gender), may indirectly reduce the gender pay gap.

The striking finding of this study is the enormous importance of overall wage structure in explaining the lower ranking of US women. The higher level of wage inequality in the United States than elsewhere works to increase the US gender differential relative to that in all the other countries in our sample. Our results suggest that the US gap would be similar to that in countries like Sweden and Australia (the countries with the smallest gaps) if the United States had their levels of wage inequality. These results are consistent across our broadly based ten-country comparison, which employs microdata sets for each country and takes into account education, potential experience, major industry, occupation and unionism, and our supplemental detailed US–Sweden comparison, in which we are able to take explicit account of actual labour force experience, a factor that has been found to be an important source of pay differences between men and women. While our focus is on explaining the relatively high pay gap in the United States compared with other industrialized countries, we do provide some evidence that wage inequality and decentralization in wage-setting are generally associated with higher gender gaps, particularly with regard to the component that may be attributed to wage structure.

This insight helps to resolve three puzzling sets of facts: (1) US women compare favourably with women in other countries in terms of human capital and occupational distribution; (2) the United States has had a longer and often stronger commitment to equal pay and equal employment opportunity policies than have most of the other countries in our sample; but (3) the gender pay gap is larger in the United States than in most industrialized countries. An important part of the explanation of this pattern is that the US labour market places a much larger penalty on those with lower levels of labour market skills (both measured and unmeasured). Put differently, our findings suggest that the gender gap in pay in the United States would be far less than it is if US wage-setting processes more closely resembled those in the other countries, as long as US women retained the same level of relative skills.[1]

The paper is organized as follows. Section I describes our data sources and presents a brief overview of our findings, highlighting the striking importance of wage structure in explaining the international differences. Section II summarizes the institutional setting in each country, focusing on gender-specific policies

and the degree of centralization of wage-setting institutions. Section III presents some indicators of the relative qualifications of women in each of the countries and indicates that the relative skills of US women compare favourably to those of women in other countries. Section IV outlines the basic analytical framework and presents detailed empirical results based on our microdata files. Finally, Section V presents our conclusions.

I. An Overview of Data Sources and Gender Earnings Ratios

The microdata sets employed in this study were obtained from a variety of sources. We used the 1985–89 International Social Survey Programme (ISSP) for the following countries and time periods: Austria (1985–87 and 1989), West Germany (1985–88), Hungary (1986–88), Switzerland (1987), United Kingdom (1985–89), Norway (1989) and United States (1985–89). The 1985–89 ISSP files lack data on Sweden, and preliminary results suggested that the Australian data in the ISSP are inconsistent with other sources and that the Italian ISSP data contain very few observations on women. We therefore supplement the ISSP with the following three microdata sets in order to include these countries with very high gender earnings ratios: the Class Structure and Class Consciousness (CSCC) database, originally compiled by Erik Wright, for Sweden (1980) and, since it is also available, Norway (1982) (providing us with a second Norwegian data-set); the Income Distribution Survey (IDS) for Australia (1986); and a Bank of Italy (BI) survey for Italy (1987). These files constitute the data source for our broadly based ten-country comparisons. In addition, we perform a special comparison for 1984 between the United States and Sweden using two additional databases with information on actual labour market experience and a superior earnings measure, the Michigan Panel Study of Income Dynamics (PSID) and the Swedish Household Market and Non-market Activities Survey (HUS).[2] These results are presented in Section IV(d). In each case, the sample is restricted to individuals aged 18–65.

The specific earnings measures used in the data for each country are described in detail in the Appendix.[3] For all cases except the 1984 Sweden–US comparison, the earnings figure is expressed on an annual or monthly basis. The computation of gender wage differentials from these data-sets is complicated by the omission from these files of information on annual weeks worked. Weekly hours worked is available, however, allowing for some adjustment of the earnings data for time input.[4] (The adjustment for time input is described below.) For the 1984 Sweden–US comparison, we are able to compute average hourly earnings.

With the exception of the 1984 HUS (Sweden) and PSID (US), the earnings variable is generally coded into categories.[5] A continuous earnings variable is constructed in the other cases by using the midpoint of the intervals. We arbitrarily coded the top (open-ended) category as 1·2 times its minimum value. However, the gender ratios were virtually identical when we experimented with alternative assumptions for the top category ranging from 1 to 1·5 times its minimum value. Finally, concern for adequate sample size led us to pool years of data for those countries in the ISSP surveyed more than once (see above).

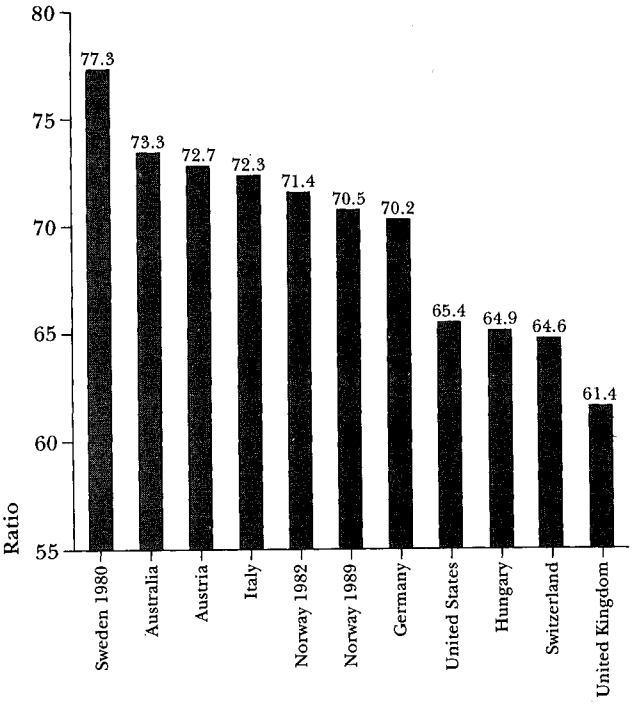

FIGURE 1. Gender earnings ratios adjusted for hours only (%).

International differences in gender gaps across the ten countries are summarized in Figure 1, which gives gender earnings ratios adjusted for hours. The figure indicates that Sweden, Australia, Austria and Italy have the highest gender ratios. The United States ranks towards the bottom of the group, with six of the nine countries (Sweden, Norway, Australia, Austria, Italy and Germany) having higher gender earnings ratios, and only three (the United Kingdom, Hungary and Switzerland) having lower ratios.[6] The Italian ratio probably overstates the actual gender ratio in that country. Italy has an especially large proportion of workers who work in an informal sector in which government-mandated benefits are not paid. It is likely that informal-sector employment is underreported by the respondents in our survey-based data, possibly resulting in an understatement of the gender gap. None the less, it is likely that Italy is among the countries with smaller gender gaps.

To illuminate the role of wage structure, we present the mean percentile rankings of women in the male wage distribution for each country in Figure 2.[7] Gender-specific factors, including differences in qualifications and the impact of labour market discrimination, are viewed as determining the percentile ranking of women in the male wage distribution, while the overall wage structure (as measured by the magnitude of male inequality) determines the wage penalty or reward associated with this position in the wage distribution. The basic premise is that males at the same percentile ranking as women may be viewed as comparable in the eyes of employers. Thus, the same set of factors will determine the relative rewards of women and of these comparable males, and differences between the rankings of countries in Figures 1 and 2 represent the role of wage structure.

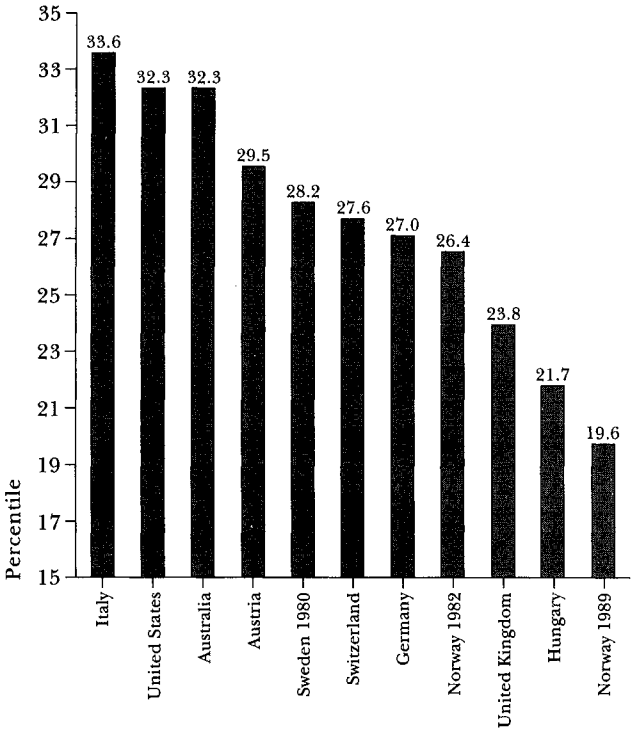

FIGURE 2. Mean female percentile in male distribution.

The most striking difference is for the United States. Whereas the United States ranks towards the bottom with respect to the female–male earnings ratios, it ranks second highest in terms of women's percentile ranking. Only Italy ranks higher and, as noted above, we have most likely overstated Italy's gender ratio. Thus, the relatively high gender pay gap in the United States does not appear to be due to a low ranking of women in the male wage distribution; rather, it is related to the higher level of wage inequality in the United States, which results in an especially large wage penalty for being below average in the distribution.

Also notable in comparing the two figures is the change in the rankings of the Scandinavian countries. Sweden falls from the highest ranked country in Figure 1 to the fifth-ranked in Figure 2, while the rankings for Norway, based on both of our microdata sets, also decline considerably. This suggests that the relatively more equal wage distribution in the Scandinavian countries is an important reason for the relatively high status of women there. So, for example, while the mean percentile ranking of women in the United States is 32·3, at the US level of male wage inequality this corresponds to a wage that is 65·4% of the male mean. In contrast, Swedish women's percentile ranking of 28·2 corresponds to a wage that is 77·3% of the male mean and Norwegian women's ranking of 26·4 in 1982 corresponds to 71·4% of the male mean.

The female percentile comparisons of the United States and the other countries are shown in greater detail in Figure 3. Parts (a)–(d) give, for each country, the female cumulative distribution functions that result from placing women in male wage deciles on the basis of the male log wage cutoffs.[8] So, for example,

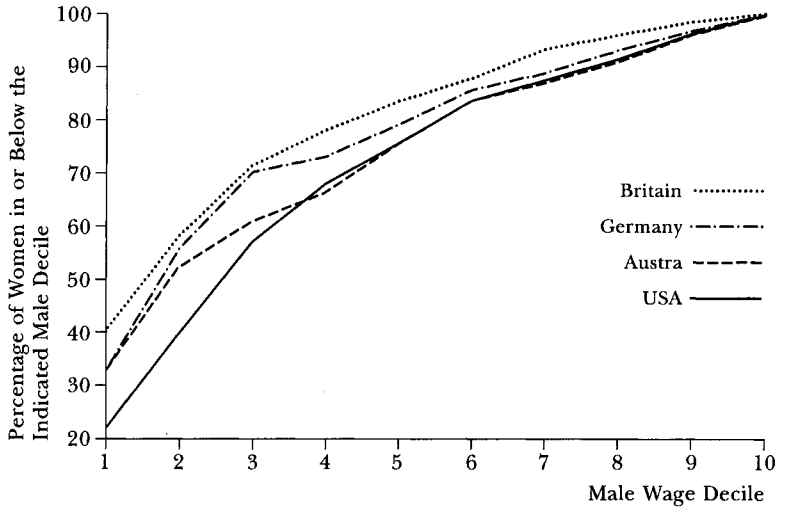

FIGURE 3(a). Cumulative distribution function, female wages relative to the male wage distribution, USA, Germany, Britain, Austria.

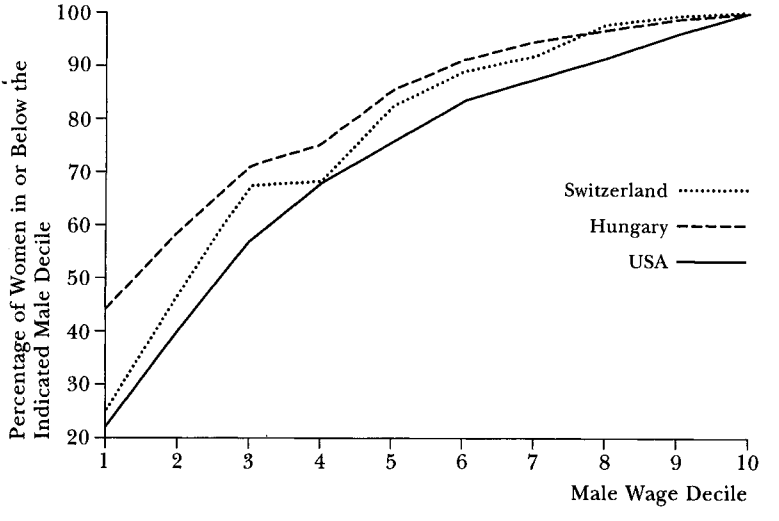

FIGURE 3(b). Cumulative distribution function, female wages relative to the male wage distribution, USA, Switzerland, Hungary.

in the United States approximately 22% of women fall in the first decile of the male distribution of log wages; almost 40% in or below the second male decile; etc. The comparison of the United States to the other countries has been made separately for two or three countries at a time to enhance clarity.

The results indicate that our conclusions based on a comparison of the mean female percentiles in the male distribution are fully supported by the more detailed comparison. Specifically, the US female cumulative distribution function is quite similar to that of Italy and Australia, which have comparable levels of mean percentiles. The US cumulative distribution lies below, or largely below, that of all the other countries. Particularly notable is the larger, often considerably larger, proportion of women in the lowest male wage decile in

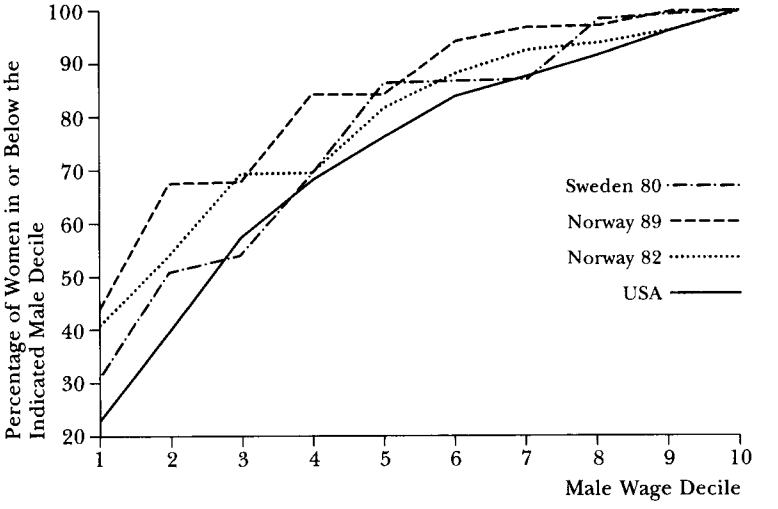

FIGURE 3(c). Cumulative distribution function, female wages relative to the male wage distribution, USA, Sweden (1980), Norway (1980), Norway (1989).

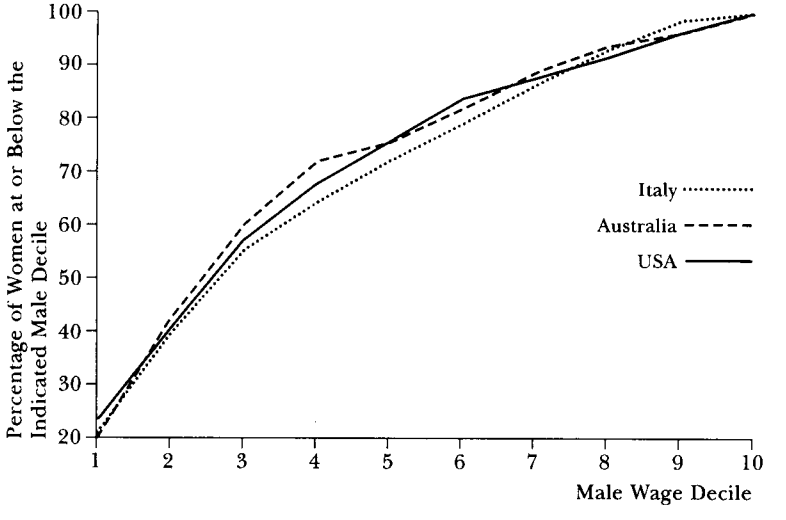

FIGURE 3(d). Cumulative distribution function, female wages relative to the male wage distribution, USA, Italy, Australia.

these other countries compared with the United States. This suggests an important role for labour market institutions which tend to 'bring up the bottom' in reducing the gender pay gap in these countries relative to the United States. That is, although the percentage of women in other countries falling in the bottom male decile generally exceeds that in the United States, the gender pay gap tends to be smaller. This suggests that formal or *de facto* wage floors in these countries lessen the wage penalty for those in the bottom decile.

II. THE INSTITUTIONAL SETTING

In this section we review international differences in gender-specific policies and basic wage-setting institutions. Human capital is also a major determinant

of gender pay gaps, and below, we present some international comparisons of indicators of women's relative levels of measured human capital. However, international differences in policies and institutions appear to be more dramatic than those in women's relative human capital levels, at least in our sample. Further, human capital can be affected by such policies and institutions as discussed below. We therefore begin with a comparison of the institutional setting.

Gender-specific policies include equal employment opportunity (EEO) and anti-discrimination laws, as well as laws and policies governing maternity and family leave.[9] The expected positive effect of the former on the earnings ratio is reasonably straightforward, although the impact will most likely depend on the effectiveness of the legislation as well as its provisions. In general, it is expected that, given considerable segregation of women by occupation and industry, equal pay laws mandating equal pay for equal work within the same occupation and firm will have a relatively small effect. Laws requiring equal opportunity, hiring preferences, and/or 'comparable worth' (i.e. equal pay for work of equal value to the firm, regardless of specific occupational category) have potentially larger impacts. In addition, since EEO laws involve occupational shifts, they may require considerable time to have an impact on pay. Thus, the comparable worth approach, which provides for immediate increases in relative pay in female-dominated occupations, may be expected to have the largest initial wage effect, possibly accompanied by a negative impact on female employment.

US anti-discrimination policies compare relatively favourably on their face with those of the other countries in our sample. All of the OECD countries in the sample have passed some equal pay and equal opportunity legislation, but the US commitment, particularly to equal employment opportunity, predates that in most of the other countries (see OECD 1988, Table 5.11, pp. 167–8). The US laws and regulations date to the 1960s and include the Equal Pay Act of 1963 (requiring equal pay for equal work), the Civil Rights Act of 1964 (requiring equal employment opportunity) and the Executive Order implemented in 1968 (which requires government contractors to take 'affirmative action' to see that women and minorities are equitably treated). While Italy mandated equal pay through collective bargaining in the industrial sector in 1960 (predating the US Equal Pay Act by three years), an Equal Employment Opportunity Act was not passed there until 1977. The earliest of the other countries, Australia and the United Kingdom, began to implement equal pay in 1969 and 1970. Equal opportunity measures were instituted in 1975 in Britain and 1978 in Norway. The remainder of the countries passed all relevant legislation in the 1980s. The one country with a clearly stronger intervention than the United States is Australia, the only one to have implemented a national policy of comparable worth through its labour courts (Gregory and Daly 1991; Killingsworth 1990).[10] Comparable worth pay policies remain rare in the US private sector, although they have been adopted by a number of state governments (Blau and Ferber 1992).

The expected impact of family leave (disproportionately taken by women even when it is available to men) is unclear *a priori*. On the one hand, it is possible that such policies raise the relative earnings of women by encouraging the preservation of their ties to particular firms and hence by increasing the

incentives of employers and women to invest in firm-specific training. On the other hand, the existence of such policies could increase the incidence and/or duration of temporary labour force withdrawals among women, raising the gender gap for the affected group. Further, the incremental costs associated with mandated leave policies may increase the incentive of employers to discriminate against women.

In contrast to anti-discrimination policy, as the only country in our sample that did not have government-mandated leave at the federal level during the period covered by our data (ILO 1988),[11] the United States clearly lagged in the provision of family leave. However it did (and continues to) require that pregnancy be treated the same as any other medical disability. Thus, leave for the physical aspects of child-bearing must be covered under a firm's medical disability plan, if it has one. Further, voluntary provision of parental leave beyond this was not uncommon. For example, in the late 1980s, 40% of employees of large and medium-size establishments were employed at firms that provided parental leave to women, the vast majority (92%) at firms offering unpaid leave (Hyland 1990). Plans allowed an average of 20 weeks off for unpaid leave. None the less, it remains the case that provision of maternity leave was less extensive as well as less generous in the United States than elsewhere. In contrast, it may be noted that provision for parental leave was particularly generous in Sweden, where nearly a year of paid parental leave is provided after 12 weeks of paid (at 90%) maternity leave.

With respect to wage structure, it seems likely that systems of centrally determined pay entail smaller gender wage differentials for a number of reasons. First, in the United States, a significant portion of the male–female pay gap is associated with inter-industry or inter-firm wage differentials that result from its relatively decentralized pay-setting institutions (Blau 1977; Johnson and Solon 1986; Sorensen 1990; Groshen 1991). Thus, centralized systems, which reduce the extent of wage variation across industries and firms are likely to lower the gender differential, all else equal. Second, since in all countries the female wage distribution lies below the male distribution, centralized systems that consciously raise minimum pay levels regardless of gender will also tend to lower male–female wage differentials. Finally, the impact of gender-specific policies to raise female wages may be greater under centralized systems, where such policies can be more speedily and effectively implemented.

US pay-setting appears to be far less centralized than that in the other countries in this study.[12] US unionization rates of 20·3% for male and 12·3% for female workers in our sample are considerably lower than elsewhere. Further, the collective bargaining process itself is very decentralized in the United States, with an emphasis on single-firm agreements, and the US government exerts minimal intervention in wage-setting (Flanagan *et al.* 1989). In contrast, in most of the other countries in our sample, bargaining is conducted on an industry-wide or even an economy-wide level. Thus, there appears to be more scope for inter-firm and inter-industry wage differentials in the US union sector. While a lower variance in the union sector of other countries could be achieved either by raising the bottom, restraining the top or both, centralized bargains often emphasize the setting of wage minima across diverse units. Events in the 1980s and 1990s have led to the decentralization of bargaining in virtually every industrialized country (Katz 1993; Edin and Holmlund 1995;

Blau and Kahn, 1996). None the less, one's impression is that, with the possible exception of Britain, systems of collective bargaining remain more centralized in the other countries than in the United States.

Several factors also lead us to expect a wider dispersion of nonunion wages in the United States than elsewhere. These include the practice in many other countries of extending the terms of collective bargaining agreements to nonunion workers. To the extent that unions in all countries tend to compress wages at the bottom in the union sector, contract extension will not only reduce wage variation in the nonunion sector, but compress wages at the bottom as well. In addition, the higher degree of union organization outside the United States may produce more 'voluntary' imitation of union pay structures by nonunion firms than in the United States (Kahn and Curme 1987). While the United States does have federal and state minimum wage legislation, the minimum is set at a relatively low level by international standards in contrast to the relatively high floors established via contract extension and other mechanisms in the other countries (EIRR 1992; Blau and Kahn 1996).

III. Gender Differences in Worker Characteristics

Below we provide a formal decomposition of international differences in gender pay gaps into various components including gender differences in measured variables. Here we briefly examine the international differences in worker characteristics, including factors that may reveal qualitative differences in women's labour force commitment. Overall, we conclude that US women compare favourably with those in other countries when we consider their labour market qualifications relative to those of men.

For most of our countries, indicators of measured human capital are limited to education and potential labour force experience. Gender differences in these variables are small for all the countries in our sample except Switzerland and Italy. In Switzerland the female labour force is less educated and younger than the male labour force, while in Italy women are more highly educated and younger than men. While, unfortunately, in most cases we lack data on actual labour market experience, some indication of labour force commitment may be gained by an examination of the labour force participation (LFP) rates by gender–marital status groups for each country, shown in Table 1.

As may be seen in the table, the labour force participation rate of US women is higher than that in any of the other countries except Sweden. The absolute male–female differential in participation rates in the United States is comparable to that in Hungary and lower than that in any of the other countries apart from Sweden. While US female labour force participation rates are higher than those of most of the other countries, this does not necessarily imply that the average employed American woman has more labour market experience. It is possible that in a country with a high female participation rate recent entrants comprise a high proportion of the labour force, and thus that women workers have less experience on average than in a country with a low female LFP rate. On the other hand, it may be that a country's high female LFP rate is due to a more continuous labour force attachment among women (Blau and Ferber 1992; O'Neill and Polachek 1993). Lacking complete international data on actual experience, we tentatively conclude that US women are at least as

TABLE 1

LABOUR FORCE PARTICIPATION RATES[a]

	Men			Women		
Country	Married	Not married	All	Married	Not married	All
Australia	0·8933	0·8688	0·8856	0·5624	0·6774	0·5956
Austria	0·7701	0·7956	0·7784	0·3883	0·5605	0·4444
Germany	0·8408	0·7047	0·7884	0·3742	0·5759	0·4477
Hungary	0·8552	0·8041	0·8423	0·6638	0·6320	0·6562
Italy (1980)	—	—	0·7880	—	—	0·4390
Norway (1982)	0·9067	0·7790	0·8778	0·5896	0·5960	0·5910
Sweden (1988)	—	—	0·9000	—	—	0·8500
Switzerland	0·9679	0·8477	0·9312	0·3949	0·8181	0·6045
UK	0·9211	0·8202	0·8930	0·5572	0·6686	0·5886
US	0·9068	0·8564	0·8873	0·6200	0·7076	0·6614

[a] The labour force participation rate is defined in terms of labour force status in the survey week.
Sources: for Sweden, Lofstrom and Gustafsson (1991); for Italy, OECD, *Labor Force Statistics* (1990), p. 299; the remaining figures are calculated from the authors' microdata sets described in the text. In the case of countries from the ISSP, the 1985–88 ISSP files are employed.

oriented towards market work as women in most other countries. This conclusion is supported by data on actual experience, which are available to us for the United States and Sweden in 1984. These data indicate that the male–female gap in actual experience is only slightly higher in the United States (6 years) than in Sweden (5 years).

A similar conclusion is suggested by an examination of the incidence of part-time work shown in Table 2. A smaller percentage of employed women in the United States than in any other country works part-time (less than 35 hours per week). Further, since the incidence of part-time work among men is considerably higher in the United States than in other countries, the gender differential in part-time work is generally much smaller there than elsewhere. (While the incidence of part-time work is only slightly higher for Italian than

TABLE 2

MEANS FOR PART-TIME WORK (PART) BY MARITAL STATUS, EMPLOYED SAMPLE[a]

	Men			Women		
Country	All	Single	Married	All	Single	Married
Australia	0·0457	0·0674	0·0362	0·3740	0·2070	0·4641
Austria	0·0218	0·0233	0·0211	0·2821	0·1444	0·3855
Germany	0·0170	0·0280	0·0119	0·3455	0·1663	0·5076
Italy	0·0573	—	—	0·2613	—	—
Norway (1982)	0·0697	0·0679	0·0701	0·5251	0·2673	0·5875
Sweden (1980)	0·0525	0·0500	0·0534	0·4565	0·2766	0·5272
Switzerland	0·0232	0·0377	0·0177	0·2517	0·1386	0·5000
UK	0·0366	0·0464	0·0336	0·4485	0·2034	0·5506
US	0·1145	0·1800	0·0771	0·2437	0·1915	0·2947

[a] PART is defined as employed for less than 35 hours per week. This variable is not available for Hungary. Marital status is not available for Italy.
Source: Microdata-sets described in the text; in the case of countries from the ISSP, the 1985–88 ISSP files are employed.

for US women, the Italian female labour force participation rate is much lower; see Table 1.) We particularly note the high incidence of part-time work among Scandinavian women. About 46% of Swedish and 53% of Norwegian employed women work part-time compared with only 24% of employed US women.[13] The commitment of US women to market work is further underscored by an examination of the incidence of part-time work by marital status, also shown in Table 2. In all countries, married women are more likely to work part-time than single women, and single men generally have a higher incidence of part-time work than married men. However, US married women are far less likely to work part-time than those in any other country, while US married men are slightly more likely to work part-time than those elsewhere.

Tables 1 and 2 are suggestive of a higher level of relative labour force commitment among US women, particularly married women, than among

TABLE 3

GENDER SEGREGATION INDEXES BY 1-DIGIT OCCUPATION AND INDUSTRY[a]

Country	Occupation	Industry
Australia	0·3807	0·3302
Austria	0·4020	0·3140
Germany	0·4216	0·3203
Hungary	0·4084	0·2467
Norway (1982)	0·4341	0·3893
Sweden (1980)	0·4614	0·4263
Switzerland	0·3222	0·2913
UK	0·4395	0·3488
US	0·3568	0·3430

[a] The segregation index (I) represents the proportion of women (men) who would have to change jobs for the occupational (industrial) distribution of males and females to be the same. For each country, it is computed as follows (see Duncan and Duncan 1955):

$$I=\frac{1}{2}\Sigma_i|p_{im}-p_{if}|,$$

where p_{im} is the proportion of males in the labour force employed in occupation (industry) i and p_{if} is the proportion of females in the labour force employed in occupation (industry) i.
Source: Microdata-sets described in the text. In the case of countries from the ISSP, the 1985–88 ISSP files are employed.

those in most other countries.[14] Table 3 indicates a lower level of occupational segregation (at the one-digit level of aggregation) for US women than for those in other countries (with the exception of Switzerland).[15] Industrial segregation, again measured at the one-digit level, is similar in the United States to that in other countries. The high levels of occupational and industrial segregation in Scandinavia are especially noteworthy and perhaps understandable in light of the high incidence of part-time work there. A country's level of occupational segregation is likely to reflect both women's relative training levels and labour force commitment and the impact of employers and of governmental or union policies (Reskin *et al.* 1986; Blau and Ferber 1992). To the extent that it reflects training and commitment, we may again conclude that US women's workforce credentials relative to men's equal or exceed those in other countries.

IV. Analysis of International Differences in the Pay Gap: The Effects of Skills, Treatment of Women and Overall Inequality

(a) A method of decomposing the international differences in the pay gap

Juhn *et al.* (1991) have devised a method for examining within-country trends in demographic differentials which we have adapted to decompose the international differences in gender pay gaps into a portion due to gender-specific factors and a portion due to differences in wage structure. Suppose that we have, for male worker i and country j, a male wage equation

$$(1) \qquad Y_{ij} = X_{ij} B_j + \sigma_j \theta_{ij},$$

where Y_{ij} is the log of wages; X_{ij} is a vector of explanatory variables; B_j is a vector of coefficients; θ_{ij} is a standarized residual (i.e. with mean 0 and variance 1 for each country); and σ_j is the country's residual standard deviation of wages (i.e. its level of residual wage inequality for males). Note that, following Juhn *et al.* (1991), our equation (1), which is used for expositional purposes, appears to impose symmetry on the distribution of residuals. As will become clear below however, in empirically implementing their decomposition neither they nor we in fact make this assumption.

Then the male–female log wage gap for country j is:

$$(2) \qquad D_j \equiv Y_{mj} - Y_{fj} = \Delta X_j B_j + \sigma_j \Delta \theta_j,$$

where the m and f subscripts refer to male and female averages, respectively; and a Δ prefix signifies the average male–female difference for the variable immediately following. Equation (2) states that the country's pay gap can be decomposed into differences in measured qualifications ΔX_j and differences in the standardized residual $\Delta \theta_j$ (multiplied by the money value per unit difference in the standardized residual σ_j). Note that the final term of (2) corresponds to the 'unexplained' differential in a standard decomposition of the gender differential when the contribution of the means is evaluated using the male function.

The gender pay gap difference between two countries j and k can then be decomposed, using (2):

$$(3) \qquad D_j - D_k = (\Delta X_j - \Delta X_k) B_k + \Delta X_j (B_j - B_k) + (\Delta \theta_j - \Delta \theta_k) \sigma_k + \Delta \theta_j (\sigma_j - \sigma_k).$$

The first term in (3) reflects the contribution of inter-country differences in observed labour market qualifications (X) to the gender gap. For example, the pay gap in one country may be less than in another owing to women's higher relative levels of education. The second term reflects the impact of different measured prices across countries for observed labour market qualifications. For example, for a given (positive) male–female difference in schooling, a higher return to education will raise the male–female pay gap.

The third term measures the effect of international differences in the relative wage positions of men and women after controlling for measured characteristics (i.e. whether women rank higher or lower within the male residual wage distribution). That is, it gives the contribution to the international difference in the gender gap that would result if the two countries had the same levels of residual male wage inequality and differed only in their percentile rankings of the female

wage residuals. In one country, for instance, the average woman's wage residual may be at the 35th percentile of the male distribution, while in another country, it may be at only the 25th percentile. This percentile ranking may reflect gender differences in unmeasured characteristics and/or the impact of labour market discrimination against women. In the empirical work that follows, we label this term the 'gap' effect.

Finally, the fourth term of (3) reflects inter-country differences in residual inequality. It measures the contribution to the inter-country difference that would result if two countries had the same percentile rankings of the female wage residuals and differed only in the extent of male residual wage inequality. Suppose, as is likely, that, controlling for measured characteristics, the female mean log wage is less than the male mean in country j. Then, the larger is the inter-country difference in the overall residual inequality in wages $(\sigma_j - \sigma_k)$, the larger difference there will be in the ultimate pay gaps in the two countries. That is, deficits in female unmeasured skills or discrimination lower women's position in the male distribution of wage residuals. The larger the penalty a country places on this lower position, the larger will be its pay gap. In the empirical work below, we label this the effect of 'unobserved prices'.

Under the assumption of normality, the third and fourth terms of (3) could be evaluated at the mean using the estimated value of σ for each country. Following Juhn *et al.* (1991), however, we estimate these terms empirically using the entire distribution of male and female residuals from the male wage equation for each country. For example, to compute $(\Delta\theta_j - \Delta\theta_k)\sigma_k$, we first give each woman in country j a percentile number based on the ranking of her wage residual (from the country j male wage regression) in country j's distribution of male wage residuals. We than impute each country j woman's wage residual given her percentile ranking in country j and the distribution of male wage residuals in country k. This imputed residual (multiplied by -1) is our estimate of $\Delta\theta_j\sigma_k$. (Recall that the mean male residual is always zero.) The actual mean female wage residual from the country k male distribution of residuals (multiplied by -1) constitutes our estimate of $\Delta\theta_k\sigma_k$. The difference between the mean of these imputed wage residuals for country j and the actual mean female wage residual for country k gives the estimate of $(\Delta\theta_j - \Delta\theta_k)\sigma_k$. The fourth term of (3), $\Delta\theta_j(\sigma_j - \sigma_k)$, is obtained analogously. Note that, by using the actual distribution of male residuals, this procedure does not impose any assumption of symmetry on the residual distribution.

According to (3), the full impact of gender-specific factors is reflected in the sum of the first and third terms, the effect of gender differences in qualifications and of gender differences in wage rankings at a given level of measured characteristics. Labour market structure is reflected in the sum of the second and fourth terms, the impact of inter-country differences in returns to measured and unmeasured characteristics. Within the framework of a traditional decomposition, the sum of the third and fourth terms represents the impact of inter-country differences in the 'unexplained' differential which is commonly taken as an estimate of discrimination.

Note that equation (3) is an index number formulation, and that a change in any of the weights employed could alter the specific value obtained for each of the four components of the decomposition. For example, the formulation we employ is based on a male wage equation, rather than, say, a female equation

or a pooled wage equation. Our rationale for this decision is that international differences in the coefficients from a male wage regression would be less affected by international differences in the extent of discrimination against women than would coefficients from a female or a pooled male–female equation. Since these coefficients constitute our estimate of each country's prices of observed characteristics, it is important that they be as uncontaminated as possible by the extent of discrimination against women in each country.[16] Similarly, in the empirical work below, each country j is compared with the United States (i.e. country k). This means that country j weights (i.e. ΔX_j and $\Delta\theta_j$) are used to evaluate the international differences in the components of wage structure—observed and unobserved prices (i.e. $(B_j - B_k)$ and $(\sigma_j - \sigma_k)$), while the US weights (i.e. B_k and σ_k) are used to evaluate the contribution of international differences in gender-specific factors—observed Xs and women's rankings in the male residual wage distribution (i.e. $(\Delta X_j - \Delta X_k)$ and $(\Delta\theta_j - \Delta\theta_k)$). Reversing this, that is using country j weights to evaluate differences in gender-specific factors and US weights to evaluate differences in wage structure, could alter the specific results somewhat. The use of one country (e.g. the United States) as a consistent frame of reference for all the pair-wise comparisons is desirable, since in that way the magnitude of US–country j differences may be compared across countries in our sample. The selection of the United States as this reference country in the decomposition is logical, since this study is chiefly concerned with the sources of the relatively high gender wage gap in the United States.

The possibility of discrimination complicates the interpretation of the last term of (3). With labour market discrimination, this term in part reflects the interaction between country j's level of discrimination (which pushes women down the distribution of wages) and inter-country differences in the overall level of inequality, which determine how large the penalty is for that lower position in the distribution (Juhn *et al.* 1991). We will present some indirect evidence that, in the case of the countries compared here, this term at least in part reflects the impact of overall wage-setting. The observed price effect may also reflect discrimination if, for example, women are 'crowded' by exclusion into certain sectors, lowering relative earnings there even for men (Bergmann 1974).

A final issue to note in interpreting our results is that they may be affected by selectivity bias (Heckman 1980). This is of particular concern in that, as may be seen in Table 1, countries vary considerably in their female labour force participation rates. While it is theoretically possible for labour force participants to be either a positively or negatively selected group in terms of their unmeasured characteristics (Blau and Beller 1988), a plausible possibility is that women are a more positively selected group in terms of their unmeasured characteristics in countries with relatively low female participation rates. A conventional approach to adjusting for selectivity bias in unmeasured characteristics is to employ a Heckman (1980) selectivity bias correction to obtain consistent estimates of the coefficients in the earnings equation. This approach, however, has come under increasing criticism for its lack of robustness: 'seemingly small misspecifications may generate large biases in estimates . . .' (Manski 1989, p. 356). For this reason, we do not employ it here. Our use of the male earnings function to perform the decomposition helps to ameliorate this difficulty, since there is considerably less international variation in male

than in female participation rates (Table 1). It is none the less true that the estimated gap effects may include the impact of gender differences in unmeasured characteristics as well as gender differences in discrimination—this is of course always the case in such decompositions. However, the international differences in female participation rates suggest that the magnitude of these two components may well vary across countries. This is not of undue concern for our study, however, since our major interest is in identifying the role of wage structure versus gender-specific factors, rather than identifying the importance of discrimination *per se*. Gender-specific factors include the impact of gender differences in both measured and unmeasured characteristics, as well as discrimination.

(b) Implementing the decomposition

We implement the decomposition using the Juhn *et al.* (1991) accounting method performed on equation (1). With the exception of the US–Sweden 1984 comparison, each country's gross gender differential is expressed in terms of *YFULL*, log earnings corrected for hours. These estimates were obtained as follows. For each country, the following regression was run separately by sex:

$$(4) \qquad \ln EARN = b_0 + b_1 PART + b_2 HRPART + b_3 HRFULL + B'X + e,$$

where ln (*EARN*) is the natural log of earnings; *PART* is a dummy variable for part-time employment defined as less than 35 hours per week;[17] *HRPART* and *HRFULL* are interactions of weekly work hours with part- and full-time status; X is a vector of explanatory variables described below; and e is an error term. The model allows for both a part-time shift term and different slopes for hours for part-time and full-time workers. A detailed adjustment for part-time employment is important in light of the prevalence of part-time work for women in many countries.

The *PART*, *HRPART* and *HRFULL* coefficients from (3) were used to adjust each person's earnings for work hours by assuming a 40-hour work week. That is, for each worker i, we have

$$(5) \qquad YFULL_i = \ln EARN_i - b_1 PART_i - b_2 HRPART_i - b_3 (HRFULL_i - 40),$$

where the coefficients, b_n, are obtained from estimating equation (4) for males and females separately.[18]

The explanatory variables in X include the traditional human capital variables of education, potential experience and its square, as well as union membership, and one-digit industry and occupation dummy variables.[19] (See the Appendix for variable definitions.) The structural variables (i.e. industry, occupation and unionism) may reflect both worker skills and rents received by workers with these characteristics. Unfortunately, the data-sets available to us for the broad ten-country comparison lack information on actual labour market experience. Thus, this remains an important omitted variable in these analyses, although, to some degree, our controls for education, hours, industry and occupation may pick up some of the effects of such omissions. Fortunately, data on actual experience are available for the 1984 Swedish–US comparison presented in Section IV(*d*). As we shall see, those results are quite supportive of our findings based on potential experience for Sweden and the other countries.

We have not controlled for marital status in this analysis, although it may be an important factor influencing the pay gap. An alternative would have been to include martial status as a productivity characteristic. However, such an approach is problematic since this variable appears to measure higher skills for men (Korenman and Neumark 1991) but most likely lower skills for women, especially when data on actual labour market experience are lacking. The approach we have followed allows us to place a sharper interpretation in the decomposition on the impact of differences in labour market skills. Recognizing the potential importance of marital status, however, we also perform a decomposition of pay gaps among married and single workers based on our overall wage equation. Number of children was not explicitly available in most of our data-sets,[20] but similar considerations would have led us to exclude this variable as well. Number of children is likely to be an indicator of work discontinuity for women, but to measure greater workforce commitment for men. The availability of actual labour market experience for our 1984 Sweden–US comparison presented below enables us to examine the sensitivity of our findings to this important omitted variable. As noted above, at least for this two-country comparison, our major findings are unchanged when we are able to include a measure of actual experience.

Before proceeding further, however, it is useful as a check on our basic approach to enquire whether a significant portion of the overall differences between the United States and other countries in these data-sets is due to differences in the marital status composition of the workforce. If this is the case, it would suggest a need to deal with marital status more explicitly in our estimating equation. To address this question, gross hours-corrected gender earnings ratios based on the mean of *YFULL* for married and single workers were calculated for each country and are shown in the first two columns of Table 4. As expected, in each country the gender gap is smaller for single than

TABLE 4

THE IMPACT OF FAMILY COMPOSITION ON GENDER EARNINGS RATIOS AND FEMALE PERCENTILES CORRECTED FOR HOURS ONLY[a]

	Gender ratio				Mean female wage percentile	
	Actual		All workers		All workers	
Country	Married workers	Single workers	Actual	US family composition[b]	Actual	US family composition[c]
Australia	0·6755	0·9044	0·7334	0·7386	32·3	31·6
Austria	0·6452	0·9111	0·7265	0·7343	29·5	29·6
Germany	0·5988	0·9641	0·7017	0·7171	27·0	27·0
Hungary	0·6084	0·7734	0·6488	0·6629	21·7	21·7
Norway (1982)	0·6756	0·8959	0·7139	0·7412	26·4	25·2
Norway (1989)	0·6722	0·8079	0·7054	0·7138	19·6	19·2
Sweden (1980)	0·7209	0·9435	0·7726	0·7866	28·2	28·6
Switzerland	0·6140	0·8710	0·6455	0·6873	27·6	28·3
UK	0·5585	0·8301	0·6142	0·6466	23·8	23·7
US	0·5485	0·8681	0·6535	0·6535	32·3	32·3

[a] *YFULL*, earnings evaluated at full-time (40) hours (see equation (5)). The number of hours is not available for Hungary, but all workers are full time.
[b] Computed using US proportions of married and single workers.
[c] Computed using US proportions of female married and single workers.

for married workers. (Marital status is of course in part a proxy for the presence of children.) Moreover, except for Hungary, for which we have no data on hours, the pay ratio is relatively high among single workers, ranging from 0·81 to 0·96.[21] Further, the rankings of the pay gaps for single workers are not always consistent with the overall rankings. In contrast, the pay gap is much larger for married workers and corresponds more consistently to the rankings for the overall labour force. None the less, since the ratios for married workers are always lower than those for single workers, a question may be raised as to whether the overall differences in ratios across countries are simply due to inter-country differences in family composition. This appears not to be the case, however. In the fourth column of Table 4, the earnings ratios for all workers are computed using the US proportions of married and single workers. The implied ratios are similar to those for all workers shown in the third column of the Table. In like manner, the mean percentile rankings computed using the US proportions of female married and single workers are quite close to the actual mean female percentiles. These similarities indicate that cross-country differences in the family composition of the labour force do not account for the observed differences in relative pay gaps and percentile rankings.

(c) Empirical results: a ten-country comparison

The results of applying the decomposition for the whole labour force across our broad range of countries is summarized in Table 5. We see that the mean female residual percentile (i.e. the mean female percentile after controlling for measured characteristics)[22] ranges from 18·5 in Norway (1989) to 37·5 in Switzerland. It is noteworthy that US women with a mean percentile ranking of 35·5 place with the top group (including Switzerland, Australia, Sweden 1980 and Italy). The column headed 'Gap' shows the contribution of each country's female placement in the male residual wage distribution to its relative pay gap. The figure is positive for all countries except Australia, Italy and Sweden,[23] indicating that these differences in rankings raise the differential relative to the United States, often substantially. (The unweighted average effect is 0·2333.) In contrast, the column headed 'Unobserved prices' shows that the lower level of residual wage inequality in each of the other countries has a negative effect, often quite considerable, on its gap relative to that in the United States. (The unweighted average effect is −0·2560.)

Table 5 also provides estimates of the impact of measured skills and their prices on inter-country differences in the pay gap. The 'Observed Xs' effect is, with three exceptions (i.e. Hungary, Norway 1989 and Sweden 1980), positive, indicating that US women have relatively favourable levels of the measured variables. (The unweighted average effect is 0·0126.) The 'Observed prices' effect is always negative, indicating that the male returns to the explanatory variables increase the pay gap in the United States relative to that in other countries. (The unweighted average effect is −0·0542.) However, these observed effects are much smaller in magnitude than the 'Unobserved prices' and 'Gap' effects.

The last two columns of the lower panel of Table 5 give the total effect of gender-specific factors and wage structure. As our discussion of the components suggest, US women fare well with respect to gender-specific factors (as measured by the sum of the 'Observed Xs' and the 'Gap' effects). With a

TABLE 5

ANALYSIS OF LOG WAGES (*YFULL*), all workers

Country	D[a]	Mean female residual	Mean female residual percentile[b]	Male residual std. dev.	Female residual std. dev.[c]	$D_i - D_{USA}$
Australia	0·3101	−0·2385	36·8	0·5998	0·6811	−0·1198
Austria	0·3195	−0·3019	28·1	0·3776	0·4315	−0·1059
Germany	0·3542	−0·3020	29·8	0·3780	0·4822	−0·0712
Hungary	0·4326	−0·4110	21·2	0·3898	0·3665	0·0129
Italy	0·3249	−0·2304	35·9	0·4731	0·4974	−0·1008
Norway (1982)	0·3370	−0·3070	29·5	0·4101	0·5120	−0·0884
Norway (1989)	0·3490	−0·3230	18·5	0·2724	0·3108	−0·0761
Sweden (1980)	0·2580	−0·1986	36·2	0·4231	0·4551	−0·1674
Switzerland	0·4377	−0·2232	37·5	0·4049	0·5236	0·0123
UK	0·4875	−0·4001	23·7	0·4068	0·4486	0·0621
US	0·4254	−0·3079	35·5	0·6646	0·7699	—

Country	Observed Xs	Observed prices	Gap	Unobserved prices	Sum gender-specific[d]	Sum wage structure[e]
Australia	0·0563	−0·0732	−0·0671	−0·0358	−0·0108	−0·1090
Austria	0·0575	−0·1573	0·2813	−0·2873	0·3388	−0·4446
Germany	0·0318	−0·0973	0·2421	−0·2480	0·2739	−0·3453
Hungary	−0·0567	−0·0287	0·6272	−0·5290	0·5705	−0·5577
Italy	0·0299	−0·0094	−0·0239	−0·0974	0·0060	−0·1068
Norway (1982)	0·00002	−0·0874	0·2112	−0·2121	0·2112	−0·2995
Norway (1989)	−0·0760	−0·0142	0·5829	−0·5688	0·5069	−0·5830
Sweden (1980)	−0·0309	−0·0270	−0·0122	−0·0971	−0·0431	−0·1241
Switzerland	0·1030	−0·0061	0·0683	−0·1530	0·1713	−0·1591
UK	0·0108	−0·0411	0·4232	−0·3310	0·4340	−0·3721
Average (unweighted)	0·0126	−0·0542	0·2333	−0·2560	0·2459	−0·3101

[a] The gender difference in *YFULL*, earnings evaluated at full-time (40) hours (see equation (5)).
[b] The mean female residual percentile in the male distribution of wage residuals.
[c] Calculated from female wage regressions.
[d] The sum of the observed Xs and gap effects.
[e] The sum of the observed and unobserved prices effects.
Notes: Regressions include controls for education, potential experience and its square, union status, and occupation, industry and (where applicable) year dummy variables. The US value used to calculate '$D_i - D_{USA}$' for Hungary, Australia and Italy is based on hours corrections from US regressions which conform to the specifications for each of those countries. However, the US value in the 'D' column is based on the more detailed specification permitted by the ISSP and CSCC data files.

few exceptions, US women tend to have relatively favourable levels of both productivity characteristics and gender-specific treatment in the labour market. The overall gender-specific effects are generally positive; the unweighted average is 0·2459. Negative effects are obtained only for Sweden (−0·0431) and Australia (−0·0108). One interpretation of the moderate gender-specific effects favouring Swedish and Australian women is that the types of gender-related interventions discussed above in Sweden (i.e. parental leave) and Australia (i.e. comparable worth) have had a particularly favourable impact. We may note two points in this regard. First, with respect to Sweden, our 1984 comparison,

which contains data on actual labour market experience, does not find a negative gap effect for Sweden. This suggests that, in so far as Sweden's parental leave policy has produced positive effects for women, they are captured by the smaller gender difference in labour market experience there. Second, with respect to Australia, our Australian data-set does not include trade unionism and, thus, we are unable to control for this variable. Since men are more likely than women to be unionized, and since the return to unionism is particularly high in the United States (Blau and Kahn, forthcoming), it is possible that, were we able to control for unionism, the small gap effect favouring Australian women would be eliminated.

In contrast to the impact of gender-specific factors which favour US women in all but two cases, the US level of inequality (reflected in the sum of 'Observed prices' and 'Unobserved prices' effects) greatly raises its gender pay gap compared with each of the other countries in the sample; the unweighted average effect is −0·3101. This inequality effect is sufficient or more than sufficient to account for the higher pay gap in the United States than in four of the six countries with smaller gaps. In the remaining two cases, the wage structure effect accounts for 91% of the Australia–US difference and for 74% of the Sweden–US difference in the magnitude of the gender gap. As will be seen in greater detail below, however, using the more precise 1984 Sweden–US comparison, wage structure is more than sufficient to account for the full difference in the gender gaps between these two countries.

An additional point of interest in Table 5 is that the residual standard deviation of the wage regressions is considerably higher for US men and women than for men and women in other countries. (The female residual standard deviation is computed from a female wage regression.) Across all the countries in the sample, the correlation coefficient between the male and female residual standard deviations is 0·9427. The fact that the male and female residual standard deviations seem to move together in this manner adds credibility to our framework in which a country's overall level of inequality is assumed to affect both men and women. The standard deviation of gross hours corrected earnings (*YFULL*) is also higher in the United States than elsewhere (results not shown). Similarly, across all countries, the correlation of the male and female standard deviations is 0·9177.[24]

Summary results are presented separately for married workers (panel A) and single workers (panel B) in Table 6.[25] The first two columns provide descriptive statistics. In column (1) we show the actual male–female log wage gap for each group corresponding to the gender ratios shown in Table 4. Column (2) gives the male–female difference in the mean residuals from the overall male wage equation. Note that, since married and single men each comprise only a subgroup of all males, the mean male residual for each group is not zero: rather, the mean residual for married men tends to be positive and that for single men, negative. The male–female difference in mean residuals corresponds to the 'unexplained' pay gap, where the gender differences in means are evaluated using the estimated coefficients from the overall male earnings regression.[26] As noted above, this is often used as a measure of the impact of discrimination.

The US–country i difference in the log wage gender gaps and the gender difference in mean wage residuals ($D_i - D_{USA}$) are shown in columns (3) and

TABLE 6

ANALYSIS OF LOG WAGES (*YFULL*), MARRIED AND SINGLE WORKERS

			$D_i - D_{USA}$			
	Descriptive statistics		Male–female mean log wage		Male–female mean residual	
Country	Male–female mean log wage (1)	Male–female mean residual[a] (2)	Actual (3)	Adjusted for wage structure[b] (4)	Actual (5)	Adjusted for wage structure[c] (6)
A: Married						
Australia	0·3923	0·2968	−0·2082	−0·1405	−0·1378	−0·0914
Austria	0·4382	0·4000	−0·1624	0·2069	−0·0345	0·3504
Germany	0·5129	0·4558	−0·0877	0·2644	0·0212	0·4130
Hungary	0·4969	0·4534	−0·1037	0·4881	0·0188	0·6025
Norway (1982)	0·3921	0·3335	−0·2085	0·0649	−0·1010	0·1319
Norway (1989)	0·3972	0·3527	−0·2034	0·2642	−0·0818	0·5618
Sweden (1980)	0·3273	0·2283	−0·2733	−0·1062	−0·2063	−0·0895
Switzerland	0·4877	0·2860	−0·1128	0·0221	−0·1486	0·1131
UK	0·5825	0·4730	−0·0181	0·3775	0·0385	0·4396
US	0·6006	0·4345	—	—	—	—
Unweighted non-US average	0·4475	0·3644	−0·1531	0·1602	−0·0702	0·2702
B: Single						
Australia	0·1005	0·1163	−0·0409	−0·0321	−0·0170	−0·0002
Austria	0·0931	0·1635	−0·0483	0·0662	0·0301	0·1873
Germany	0·0366	0·0923	−0·1048	−0·0778	−0·0410	0·0128
Hungary	0·2570	0·2766	0·1155	0·5449	0·1432	0·5058
Norway (1982)	0·1099	0·1975	−0·0315	0·0807	0·0641	0·1990
Norway (1989)	0·2133	0·2380	0·0719	0·3439	0·1046	0·4671
Sweden (1980)	0·0582	0·1189	−0·0832	−0·0453	−0·0145	0·0303
Switzerland	0·1382	0·1639	−0·0032	−0·0097	0·0306	0·1028
UK	0·1862	0·1952	0·0448	0·2036	0·0619	0·2071
US	0·1414	0·1334	—	—	—	—
Unweighted non-US average	0·1325	0·1736	−0·0089	0·1194	0·0402	0·1902

[a] Male–female difference in mean residuals for the indicated marital status group from the overall male wage regression.
[b] Adjusted for wage structure based on the US distribution of wages for all male workers.
[c] Adjusted for wage structure based on the US male distribution of residuals from the overall male wage regression.

(5). Columns (4) and (6) give the estimates of the magnitude of each of these, i.e. the male–female log wage gap and the male–female difference in mean residuals, after adjusting for wage structure. To adjust for wage structure, we evaluate the country *i* gender difference at the US level of wage inequality. In the case of the gender differences in mean residuals, this corresponds to the gap effect as defined in equation (3). The gender log wage differentials adjusted for wage structure are computed similarly, except we do not control for any variables. This approximates the total effect of gender-specific factors (i.e. the sum of the observed *X*s and gap effects) shown in Table 5, although it is computed somewhat differently. Note too that, in computing these effects for married and single workers, we use as our reference the overall male wage distribution.

Looking first at the results for married women, we see that our conclusions are quite similar to those for all workers. The US–country *i* difference in gender

log wage gaps shown in column (3) is always negative, indicating that the US gap is larger, often considerably so; the unweighted average country *i*–US difference is −0·1531 log points. After controlling for measured characteristics in the conventional fashion by looking at the differences in residuals shown in column (5), the US gap remains larger in most cases (6 out of 9 possible comparisons); the unweighted average difference is −0·0702, and only three countries have somewhat larger gender gaps for married women than the United States: United Kingdom, Germany and Hungary. When the gender difference in residuals is adjusted for wage structure, however, we find that the gender gap is generally larger in other countries, often considerably so; the unweighted average effect is 0·2702. Only two countries have smaller gaps: Sweden and Australia. Each of these countries also had negative gap effects for all workers in Table 5; however, the magnitude of the estimated effects is larger in absolute value for married workers than for all workers: −0·0895 *v.* −0·0122 for Sweden and −0·0914 *v.* −0·0671 for Australia.

Findings for the actual log wage gap adjusted for wage structure (column 4) which represents the total gender-specific effect are similar. The unweighted average US–country *i* difference is 0·1602, and only Sweden and Australia have smaller gaps than the United States. The estimated total gender-specific effects are again larger in absolute value for married workers than for all workers: −0·1062 *v.* −0·0431 for Sweden and −0·1405 *v.* −0·0108 for Australia. Thus, for married women we find that, as was the case in the full sample, with the exception of Australia and Sweden, higher US inequality (i.e. wage structure) is sufficient or more than sufficient to explain the larger pay gap in the United States compared with the countries with smaller differentials. Wage structure explains 61% of the US–Sweden difference and about one-third of the US–Australia difference.

The results for single workers, shown in panel B of Table 6, also support the notion that wage structure is important. However, since, as noted in our discussion of Table 4, the initial US–country *i* differences are smaller and the cross-country pattern of the differences is less consistently related to the pattern of international differences in overall gender ratios, the results are less informative. In general, the US differential does exceed that in other countries, but three of the other countries—the United Kingdom, Hungary and Norway 1989—have larger gaps, as is indicated by a positive sign in column (3). Adjusting for measured characteristics through a comparison of gender differences in residuals leaves only three countries with smaller gender differentials than the United States: Germany, Sweden and Australia (column (5)). After additionally adjusting for wage structure in column (6), all but one of the countries (i.e. Australia) has a larger differential than the United States and the Australia–US difference is virtually zero. This contrasts with the fairly substantial negative gap effects obtained for married women in panel A of Table 6 for both Australia and Sweden. Finally, the gender log wage gaps adjusted for wage structure which are shown in column (4) suggest that the total gender-specific effect for single workers is generally positive (i.e. favours US women), but is moderately negative in four cases: Sweden, Australia, Germany and Switzerland. Both Sweden and Australia also had negative total gender-specific effects for married women in panel A, but these effects were considerably larger in absolute value for married than for single women: −0·1062 for married women *v.* −0·0453

for single women in Sweden (1980) and −0·1405 for married women *v.* −0·0321 for single women in Australia.

One interpretation of the more favourable gender-specific effects for married women than for single women for Sweden and Australia is that the types of gender-related intervention that we have identified as significant in these countries have had a disproportionate effect on married workers; that is, not surprisingly, parental leave (Sweden), but also comparable worth (Australia), may have especially large positive effects on the relative earnings of married women.

The striking finding of Tables 5 and 6 is the importance of wage structure in explaining the higher US gender gap. However, as noted above, the observed and unobserved prices effects that represent the components of the wage structure effect could also reflect the impact of labour market discrimination. What are we thus to conclude about wage structure? From a number of indirect indicators, we conclude that it is important, even though it may not be possible precisely to estimate its effect.

First, our review of wage-setting institutions in each country strongly suggests that the US system is considerably less centralized than in other countries, thus making a finding of the importance of wage structure plausible. Second, the United States has had a longer and often stronger commitment to Equal Pay and Employment Opportunity policies than most other countries in our sample.[27] Further, US women compare favourably with women in other countries in terms of their qualifications and occupational distribution relative to men. Thus, it is credible that gender-specific factors do not explain the relatively high pay gap in the United States. Third, we found that the wage variation and residual wage variation of both men and women in the United States considerably exceeds that of the same gender group in other countries. Similarly, across all countries, female and male wage (and residual wage) variation were found to be highly correlated. This suggests that the same set of factors—measured and unmeasured prices and wage-setting institutions—affects the wages of both men and women in each country in a similar way. Finally, and perhaps most importantly, even though the estimated wage structure effect may include the impact of gender discrimination as it interacts with wage structure, our findings for the ten-country comparison none the less suggest an extremely important role for wage structure in affecting the overall gender ratio.

(d) Empirical results: a detailed comparison of the United States and Sweden, 1984

In this section we take advantage of the superior data available in the PSID for the United States and in the HUS for Sweden to verify the results obtained using our other data sources. Since these data-sets contain information on weeks as well as hours worked, we are able to calculate a wage rate. The presence of information on actual labour market experience permits us to control for this important variable in our wage regressions and corresponding decompositions. Finally, since these data are available for the same year, 1984, we are able to compare the economic status of women in each of these two countries at the same point in time. The results obtained for this comparison strongly confirm the importance of wage structure in explaining the differences in the gender wage gaps in the two countries and thus strengthen our confidence in the general findings of this study.

TABLE 7

DESCRIPTIVE STATISTICS: SWEDEN AND THE UNITED STATES, 1984[a]

	US	Sweden
Gender log wage differential	0·4019	0·1897
Gender wage ratio (%)	66·9	82·7
Mean female percentile	29·6	29·9
Male residual standard deviation	0·5110	0·2324
Female residual standard deviation[b]	0·4862	0·2283
Mean female residual	−0·1965	−0·0955
Adjusted wage ratio	82·2	90·9
Mean female residual percentile	36·6	37·4

[a] Based on HUS data for Sweden and PSID data for the United States.
[b] Calculated from female wage regressions.

Descriptive statistics for the 1984 comparison are shown in Table 7. The estimates of the gender ratio based on wages, of 66·9% for the United States and 82·7% for Sweden, are a bit higher for each country than the ratio adjusted for time inputs shown in Figure 1, but the differences are not large and, furthermore, the large US–Sweden difference remains.[28] Swedish women also fare better after adjusting for all variables, including major industry and occupation: the adjusted wage ratio was 82·2% for the United States and 90·9% for Sweden. Despite these sizeable US–Sweden differences in the adjusted and unadjusted gender ratios, the mean percentile rankings of women in the male wage distribution and residual wage distribution are virtually identical, suggesting an important role for wage structure in explaining the cross-country difference. Finally, looking at Figure 4, which gives a more detailed comparison of female percentile rankings in the two countries, we see that the female cumulative distribution functions (i.e. the percentage of women with earnings in or below the indicated male decile) are quite similar in the two countries. Indeed, a higher percentage of women in Sweden (29·1%) than in the United States (20·1%) fall in

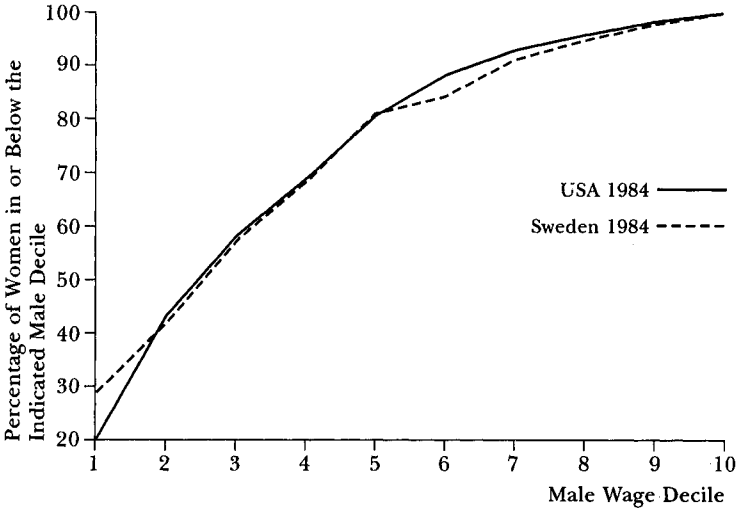

FIGURE 4. Cumulative distribution function, female wages relative to the male wage distribution, United States and Sweden, 1984.

TABLE 8

ANALYSIS OF DIFFERENCES IN THE GENDER PAY GAP: SWEDEN AND THE UNITED STATES, 1984[a]

Component	Contribution to the US–Sweden difference
Observed *X*s	−0·0054
Education variables	0·0226
Experience variables	−0·0313
Occupation variables	−0·0315
Industry variables	0·0348
Observed prices	−0·1058
Education variables	−0·0176
Experience variables	−0·0162
Occupation variables	−0·0031
Industry variables	−0·0689
Gap	0·0303
Unobserved prices	−0·1313
Sum gender-specific	0·0249
Sum wage structure	−0·2371
Total ($D_{\text{Sweden}} - D_{\text{USA}}$)	−0·2122

[a] Based on HUS data for Sweden and PSID data for the United States.

the lowest decile, as was also generally true in our ten-country comparison (Figure 3).

A detailed decomposition of the US–Sweden difference is presented in Table 8. With respect to gender-specific factors, the overall impact of gender differences in the observed *X*s in each country is negligible. This reflects a somewhat smaller gender difference in actual experience in Sweden (five years) than in the United States (six years) and a slightly more favourable relative occupational distribution of Swedish than of US women. These factors are offset by differences favouring US women relative to their male counterparts with respect to education and industrial distribution. In contrast to our results for the CSCC and ISSP data presented above, the gap effect somewhat favours US women. This may indicate that, with better data on labour market experience, the impact of Sweden's more favourable maternity leave policy is captured by the smaller gender difference in measured experience. On net, the sum of gender-specific factors slightly favours US women.

In contrast to the gender-specific factors, wage structure as indicated by the observed and unobserved prices effects strongly favours Swedish women. In terms of observed prices, the Swedish–US difference in relative rewards to employment by industry is the most important factor, although less favourable (for women) prices of education and experience in the United States also play a role. Overall, the effect of wage structure, i.e. the higher level of wage inequality in the United States, is more than sufficient to account for the considerably larger gender gap in the United States.

The results for married and single women based on the overall male wage regression are shown in Table 9. As in the case of our ten-country comparison by marital status, we find that gender log wage gaps tend to be larger in both countries for married than for single women. This is also true of the gaps

TABLE 9

ANALYSIS OF LOG WAGES, MARRIED AND SINGLE WORKERS: SWEDEN AND THE UNITED STATES, 1984

	Married	Single
Descriptive statistics		
Male–female log wage		
Sweden	0·2068	0·0909
US	0·4270	0·2689
Male–female residual		
Sweden	0·0976	0·0838
US	0·2078	0·1586
Decomposition ($D_{\text{Sweden}} - D_{\text{USA}}$)		
Male–female log wage		
Actual	−0·2203	−0·1780
Adjusted for wage structure	0·0436	−0·0518
Male–female residual		
Actual	−0·1103	−0·0748
Adjusted for wage structure	0·0229	0·0507

controlling for measured characteristics, as indicated by the male–female difference in the residuals. The Sweden–US difference in gender gaps, both in log wages and in mean residuals, is also larger for married women. In comparing our results with those in Table 6, it is interesting to note that, using a measure of actual labour market experience, we no longer find either total or residual gender-specific effects favouring Swedish married women. Thus, wage structure is more than sufficient to explain both the US–Sweden differences in overall gender gaps among married women, and gender gaps after controlling for measured characteristics. This again suggests that the favourable impact on women of Sweden's more generous parental leave policy is captured by the smaller difference between men and women in levels of experience in Sweden. For single women, the residual differential adjusted for wage structure is positive, indicating a favourable gap effect for US women. While the log wage differential adjusted for wage structure is negative, wage structure is sufficient to explain 71% of the US–Sweden difference in gender log ratios for single women. Since we have seen that the gap effect favours US women, this must be due to differences in relative levels of observed Xs favouring Swedish women.

(e) Some general evidence on the effects of institutions

The evidence so far has suggested that the relatively higher level of wage inequality in the United States is an important factor working to increase the gender gap in the United States relative to other countries. We also speculated that the more decentralized wage-setting system in the United States is responsible, at least in part, for its higher wage dispersion. While our sample for the broad cross-country comparison is relatively small (10), it is still possible to obtain some indication of whether these relationships hold more generally, i.e. beyond the individual US–other country comparisons that we have made up to this point. Specifically, we wish to know whether higher male wage inequality and decentralization of wage-setting institutions are generally associated with a larger gender gap, particularly a larger differential that may be attributed to wage structure. In the analyses below, we use as our measure of male inequality

the US–country i difference in the log wage difference between male workers at the 50th percentile of the male wage distribution and male workers at the 10th percentile of the distribution.[29]

Performing such a test also requires us to operationalize the concept of centralization in wage-setting. Several authors have produced rankings of countries with respect to the degree of centralization, including Blyth (1987), Bruno and Sachs (1985), Calmfors and Driffill (1988), Cameron (1984) and Schmitter (1981). These rankings take into account the degree of co-ordination within and between labour and management organizations, the level at which bargaining takes place, and the power of central bodies to conduct wage negotiations (Calmfors and Driffill 1988). We use as a measure of centralization the unweighted average of these rankings (which are shown individually in Calmfors and Driffill 1988, p. 18), correcting for differences across authors in the number of countries ranked. Based on this average ranking, Austria, with a ranking of 1·493 out of 17 countries, had the most centralized wage-setting system among the countries in our sample; while the United States, with a ranking of 15·191 out of 17, not surprisingly, had the least.[30] While Hungary as a Communist country in the 1980s was not included in the rankings, we assigned it the highest level of centralization since the government set wages there. This index which we term 'decentralization', is then used as an inverse measure of centralization in regressions described below.

The dependent variables in our analyses are: (1) $D_i - D_{\mathrm{USA}}$: the US–country i difference in log wage gender differentials (defined in terms of *YFULL*, the log of hours-corrected earnings); (2) the sum of gender-specific factors (observed Xs plus gap effects); (3) the sum of wage structure effects (observed plus unobserved prices effects). Note that these dependent variables are measured relative to the United States. (We include the United States with a value of zero in each case.) These dependent variables are regressed on our indicator of the level of male inequality, the US–country i difference in the 50–10 differential, and, in separate regressions, on the index of decentralization. The 50–10 differential is defined relative to the United States, as is decentralization, up to a constant.

Table 10 contains our results, both including and excluding Hungary. (The results are qualitatively similar whether or not Hungary is included.) Most striking are the findings for the wage structure effect. Both the magnitude of male inequality and the degree of decentralization of wage-setting is found to be positively associated with the wage structure effect; the coefficient is 2·6–2·8 times its standard error for the 50–10 differential and 2·7–3·4 times its standard error for decentralization. In contrast, male inequality and decentralization are negatively related to the gender-specific effect, although the coefficients are less precisely estimated; the coefficient is 1.6 times its standard error for the 50–10 differential and 1·1–1·7 its standard error for decentralization. One possibility here is that centralized wage-setting systems tend to narrow skill differentials and that this disproportionately negatively affects women's incentives to accumulate skills. Finally, we have some evidence that male inequality and decentralization are associated with a higher gender gap overall, with this coefficient smaller than its standard error for the 50–10 differential and 1·1–1·9 times its standard error for decentralization.

The results of Table 10 suggest that male inequality and decentralization are positively associated with wage structure effects increasing the gender

TABLE 10

THE EFFECT OF MALE WAGE INEQUALITY AND MALE WAGE-SETTING INSTITUTIONS ON THE GENDER PAY GAP AND ITS COMPONENTS

	Dependent variables					
Explanatory variable	$D_i - D_{USA}$	Gender-specific effect	Wage structure effect	$D_i - D_{USA}$	Gender-specific effect	Wage structure effect
Decentralization	0·0054	−0·0197	0·0251	—	—	—
	(0·0048)	(0·0115)	(0·0075)			
Male 50–10 differential: Country *i* *v.* US	—	—	—	0·0905	−0·4884	0·5789
				(0·1284)	(0·3055)	(0·2235)
Constant	−0·1021	0·369	−0·4711	−0·0143	−0·0298	0·0155
	(0·0045)	(0·1092)	(0·0711)	(0·0688)	(0·1638)	(0·1198)
Hungary in?	yes	yes	yes	yes	yes	yes
R-squared	0·1419	0·2678	0·5835	0·0584	0·2421	0·456
n	10	10	10	10	10	10
	Dependent variables					
Explanatory variable	$D_i - D_{USA}$	Gender-specific effect	Wage structure effect	$D_i - D_{USA}$	Gender-specific effect	Wage structure effect
Decentralization	0·0088	−0·0125	0·0213	—	—	—
	(0·0046)	(0·0117)	(0·0080)			
Male 50–10 differential: country *i* *v.* US	—	—	—	0·1085	−0·4161	0·5246
				(0·1289)	(0·2593)	(0·1867)
Constant	−0·1429	0·2809	−0·4237	−0·0143	0·0298	0·0155
	(0·0455)	(0·1170)	(0·0801)	(0·0685)	(0·1378)	(0·0992)
Hungary in?	no	no	no	no	no	no
R-squared	0·3454	0·1390	0·5001	0·092	0·2689	0·4631
n	9	9	9	9	9	9

differential. One reason for this may be that centralized wage-setting has particularly strong effects in bringing up the bottom of the wage distribution (Blau and Kahn, forthcoming), which would disproportionately positively affect women. Admittedly, our sample of countries is extremely small—only ten. However, these results, in conjunction with the individual US–other country comparisons, lend plausibility to the idea that wage-setting institutions are important.

V. CONCLUSIONS

In this paper, we have used microdata to examine the gender pay gap in ten industrialized countries. Published data indicate that the gender gap is higher in the United States than in most industrialized countries, and it is higher than six of the countries in our sample. The striking finding of the paper is the importance of wage structure in explaining the larger US gender gap. The higher level of wage inequality in the United States than elsewhere works to increase the gender differential in the United States relative to all the other countries in our sample. Our results suggest that the US gap would be similar to that in countries like Sweden and Australia (the countries with the smallest gaps) if the United States had their level of wage inequality. This suggests that we need to focus both on the supply and demand for skills (i.e. some of the determinants of skill prices) and on wage-setting institutions to explain this important cause international differences in the gender pay gap. In a brief

review of the institutional setting in each of these countries, we concluded that the wage-determination process in the United States is more decentralized than elsewhere, quite likely contributing to its higher level of wage inequality.

These findings have implications for analyses of trends in the gender gap across time as well as across countries. Much attention has been focused on women's growing relative levels of skills and labour force commitment as causes of changes in the pay gap. Our research suggests that, to understand changes in the gender pay gap fully, it is also important to examine the impact of changes in wage structure. As wage inequality has been rising in most industrialized countries (Freeman and Katz 1995), women may well have been swimming upstream in labour markets that are growing increasingly unfavourable to workers with below-average skills. In the face of rising rewards to labour market skills, women's relative skills and treatment have to improve merely for the pay gap to remain constant; still larger gains are necessary for it to be reduced.

Our recent work on trends in the gender gap in the United States (Blau and Kahn 1994) suggests that rising inequality did indeed work to widen the gender gap over the 1970s and 1980s. Had there been no gender-specific improvements for women, the gender earnings ratio would have fallen from 60% in 1975 to 56% in 1987. Women were, however, able to swim against the current and narrow the gender gap by improving their relative qualifications, particularly their relative experience and occupational distribution. They also benefited from a substantial decline in the 'unexplained' portion of the gender gap, which may reflect improvements in unmeasured characteristics or reductions in discrimination. An additional factor that may have contributed to this reduction in the unexplained gender differential was a shift in the composition of demand favouring women relative to men overall, and particularly among low-skilled workers. As a consequence of these offsetting gender-specific factors, the gender ratio had increased to 70% by 1987.

APPENDIX

Definitions of dependent variables

Australia	Annual earnings from all jobs
Austria	Net monthly income from employment
Germany and Switzerland	Net income per month after taxes and social insurance
Hungary	Monthly earnings
Italy	Annual labour income
Norway (1982)	Annual income from all jobs
Sweden (1980)	Income (from all sources) in previous year
Sweden (1984)	Average hourly earnings
US (1985–89)	Previous year's earnings from occupation before taxes
US (1984)	Average hourly earnings
UK	Total annual earnings before taxes

Definitions of explanatory variables

EDUC	= years of schooling completed
PEXP	= age − *EDUC* − 6
PEXPSQ	= *PEXP*-squared
EXP	= actual experience (*PSID* and *HUS* only)
EXPSQ	= *EXP*-squared (*PSID* and *HUS* only)
MAR	= 1 if married spouse present and 0 otherwise
UNION	= dummy variable for union membership

Occupation dummy variables

PROF	= professional and technical workers (the omitted category)
MGR	= managers, except farm
CLER	= clerical workers
SALES	= sales workers
CRAFT	= craft workers
OPER	= operatives
LAB	= labourers, except farm
SERVWK	= service workers
FARMMGR	= farm managers
FARMLAB	= farm labourers

Industry dummy variables

AG	= agriculture, forestry and fisheries
MINCON	= mining and construction
MANDUR	= durable goods manufacturing
MANNON	= nondurable goods manufacturing
TRANS	= transportation, communications and utilities
WTRADE	= the wholesale trade
RTRADE	= retail trade
FIRE	= finance, insurance and real estate
SERVS	= services
GOVT	= government (the omitted category)

Industry dummy variables for Hungary

AG	(see above)
MINMAN	= mining and manufacturing
CONST	= construction
TRANS	(see above)
TRADE	= wholesale and retail trade
FISERV	= services, finance, insurance and real estate
GOVT	(see above), the omitted category

Occupation dummy variables for Australia

MGR	= managers and farm managers
CLER, *CRAFT*, and *OPER*	(see above)
LAB	= labourers and farm labourers
SALESW	= sales and service workers
PROF	(see above), the omitted category

Industry dummy variables for Australia

AG, *TRANS*, *MINCON*	(see above)
MANUF	= manufacturing
TRADE	= wholesale and retail trade
FISERV	(see above)
GOVT	(see above), the omitted category

Occupation dummy variables for Italy

BLUE	= blue-collar
WHITELOW	= lower-level white-collar
WHITEHI	= higher-level white-collar, the omitted category

Industry dummy variables for Italy

AG, *TRANS*, *TRADE*	(see above)
IND	= mining, construction and manufacturing
FIRE, *GOVT*	(see above)
SERVS	(see above), the omitted category

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NOTES

1. Of course, under different wage-setting institutions, US women might have different incentives to acquire labour market skills.
2. For descriptions of these data, see Blanchflower and Freeman (1992) for ISSP; Rosenfeld and Kalleberg (1990) for CSCC; Blackburn and Bloom (1991) for IDS; Erickson and Ichino (1995) for BI; Blau and Kahn (1994) for PSID; and Edin and Holmlund (1995) for HUS.
3. Unfortunately there are some differences across countries in the exact definitions of the income variables. While in most cases the income data are measured before taxes, for Austria, Germany and Switzerland income is measured after taxes. Similarly, while in other cases income from earnings is available, in the case of Sweden (1980), the income measure includes income from all sources. While these differences are of some concern, it is reassuring that the international rankings of the gender ratios that we computed based on our microdata are consistent with published sources and other studies (see below). In addition, our results for Sweden are quite similar when we use the 1984 HUS data, which do enable us to identify earnings. The impact of the tax system on the labour force behaviour, and hence on the earnings of men and women, is itself a question of some interest. Unfortunately it is not one that we are in a position to investigate.
4. There is information on weeks worked for Australia and for a subset of the 1982 Norwegian data. Analyses correcting for weeks worked yielded very similar results to those reported here, with slightly lower adjusted gender differentials. Lack of information on hours worked for those with multiple jobs forced us to limit the 1980 Swedish sample to those with one job only.
5. The Australian earnings data were originally reported as a continuous variable. However, to maintain comparability with the other countries, we recoded the Australian earnings into the ISSP's intervals for Australia. When the analysis was performed for Australia using the original continuous variable, the results were virtually identical to those reported here. The BI data were also continuous but did not match up with the ISSP categories for Italy. We therefore used the continuous earnings variable for Italy.
6. The country rankings here are similar to those based on published data (when available) or other studies. Note, however, that the ratios for the Scandinavian countries and Australia are below those reported in OECD publications. This discrepancy appears to be due to the OECD data being restricted to manufacturing workers for Sweden and Norway and to non-supervisory employees for Australia. The magnitudes of the gender ratios that we obtain are consistent with other studies that use microdata for these countries.
7. That is, we assign each woman in country j a percentile ranking in country j's male wage distribution. The female mean of these percentiles by country is presented in Figure 2.
8. Bernhardt *et al.* (forthcoming) use a similar methodology to examine the distribution of women's wages relative to the male distribution over time in the United States.
9. Child care is another important area of public policy that affects women, but one that is more difficult to summarize across our large set of countries. In addition, non-governmental initiatives may be important. Below we summarize the extent of voluntary provision of parental leave by private employers in the United States during the period covered by our data.

10. Switzerland incorporated the principle of equal pay for work of equal value into its constitution in 1981 (Simona 1985), but there is no indication that it has been implemented as yet.
11. In 1993 the United States passed the Family and Medical Leave Act, mandating that employers provide up to 12 weeks of unpaid leave to parents for the birth or adoption of a child.
12. A more detailed examination of these institutional differences is provided in Blau and Kahn (forthcoming).
13. The high incidence of part-time work for Scandinavian women may be due in part to the generous family leave policies in these countries. In addition to policies guaranteeing paid parental leave in both Sweden and Norway, Sweden has since 1979 allowed working parents of small children the right to have a six-hour day on demand (Haavio-Mannila and Kauppinen 1992).
14. Our conclusion regarding labour force commitment might be altered if US women were more likely than women in other countries to work part-year, if not part-time. However, an examination of the countries in our sample for which we have 'weeks worked' information does not yield a consistent pattern regarding this issue. For example, US employed women worked an average of 45 weeks per year (1984, PSID), while Swedish women worked an average of 41 weeks (1984, HUS), and those in Australia (1986, IDS) and Norway (1982, CSCC) were employed 46 and 49 weeks, respectively.
15. This conclusion regarding the US position largely holds true when the segregation index is calculated using published data from the ILO (Blau and Ferber 1992, p. 309). Note that our findings for Switzerland must be interpreted with caution, given the small size of our sample. A segregation index computed on the basis of ILO data does not indicate a lower level of segregation for Switzerland than for the United States.
16. This is not to say, however, that they are completely uncontaminated by discrimination. This is discussed further below.
17. Countries may differ in their definitions of 'part time'. We adopt the 35-hour cut-off which is employed by the OECD in its tabulations of part-time employment (OECD 1989). Hours information was not available for self-employed workers in Italy. Earlier results suggested that the gender ratio for Italy was overstated when the self-employed were excluded. Thus, hours were imputed for this group based on hours regression equations estimated for wage and salary workers including the full-set of explanatory variables.
18. For countries with more than one year of data, the log earnings variable was obtained by including dummy variables for year in equation (4) and transforming each observation into its 1989 (or end-year) equivalent in calculating *YFULL* in equation (5).
19. For Hungary, Australia and Italy, industry and/or occupation differ from those for the rest of the countries. In addition, for the latter two countries and for the Sweden (1984), union membership status is not available. For the purposes of comparing the United States and these countries, we estimated US equations that conformed to the same specification as each country.
20. It would have been possible, however, to construct a proxy for number of children: number of non-spouse others in the household.
21. Reasons for the low estimated pay gaps among single workers include the likelihood that they are disproportionately young (the pay gap is lower for young workers—see Mincer and Polachek 1974), and that single males are less productive than married males (see Korenman and Neumark 1991).
22. For each country, this is the mean of the percentile ranking of each woman's residual from the male regression (e_{if}) in the distribution of male wage residuals (e_{im}).
23. Although Swiss women have a higher mean percentile ranking than US women, the gap effect is positive. Such inconsistencies can arise because in essence a different set of weights are employed in calculating the mean percentile rankings and the gap effects. Specifically, as noted above, based on her residual from the male wage equation, each Swiss woman is given a percentile ranking in the Swiss male distribution of wage residuals. She is then allocated a wage residual based on these percentile rankings and the US male distribution of wage residuals. The mean of these imputed residuals (multiplied by -1; i.e. $\Delta\theta_j\sigma_k$) may be larger than the actual mean wage residual of US women (multiplied by -1; i.e. $\Delta\theta_k\sigma_k$) even if the mean of the percentile rankings of each woman's residual from the male regression is higher in Switzerland than in the United States.
24. These calculations include, for Norway, a weighted average of the two observations for that country where the weights are determined by sample sizes. The United States and Sweden (1984) are not included because the earnings measure employed—average hourly earnings—differs from that available for the other countries.
25. Marital status is not available for Italy.
26. Illustrating for married workers, the mean residuals for married males (m) and married females (f) are:

$$e_m = Y_m - X_m B \text{ and } e_f = Y_f - X_f B,$$

where Y_m and Y_f are the mean earnings of married males and married females, X_m and X_f are

the vectors of means of the explanatory variables for married males and married females, and B is a vector of estimated coefficients from the overall male earnings regression. Thus, the gender difference in residuals is:

$$(e_m - e_f) = (Y_m - Y_f) - (X_m - X_f)B.$$

27. A primary exception is the comparable worth approach pursued in Australia, which might be expected to produce a larger immediate impact on wages.
28. Another source of differences in the gender ratios for these two countries in Table 7 and Figure 1 is the time periods: 1980 for Sweden and 1985–89 for the United States in Figure 1 compared with 1984 for both countries in Table 7.
29. In these analyses, the two observations on Norway were averaged using sample size as weights. The United States and Sweden 1984 were excluded since the wage variable in these analyses was defined as the log of actual hourly earnings, unlike the rest of the sample.
30. The degree of centralization for the other countries in our sample was: West Germany 6·943; United Kingdom 12·632; Switzerland 10·904; Sweden 2·736; Norway 2·536; Australia 10·766; and Italy 14·325.

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