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ABSTRACT In this article the authors seek an answer to the question: does the percentage of women working in an industry have an effect on earnings distinct from the effect of sex at the individual level? On the basis of the 'comparable worth' approach, the authors hypothesized that, controlling for education, experience and sex, the percentage of women working in an industry would have a negative effect on earnings. This hypothesis was tested by performing multi-level analyses using data from 12 countries. The hypothesis was confirmed: the multi-level analyses showed a significant negative effect of the percentage of women in an industry on individual earnings, when individual characteristics were controlled for. This effect applied equally for men and women working in an industry. Part, though not all, of the effect could be accounted for by the fact that female-dominated industries are less unionized and more characterized by small firms than male-dominated industries.

KEY WORDS earnings ◆ gender gap ◆ industries

INTRODUCTION

It is common knowledge that women earn less than men do. In most industrialized countries there is a large gender gap in earnings (Blau, 1978; Concoran and Duncan, 1979; England, 1992; Madden, 1973; Mincer and Polachek, 1978). These differences between women and men are found to be very persistent: the gender differences hardly change over time. On average, women's earnings are between 60 and 73 percent of men's.

Human capital theorists (Kuhn, 1987; Lloyd and Niemi, 1979; Treimann and Hartmann, 1981) have sought to account for these gender differences

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in terms of differences in individual characteristics such as education and 'on-the-job training'. Men invest more on average than women in education and for this reason receive a higher wage. Differences between working women and men in age and work experience have also been brought forward as causal factors. Because in the labour market men are on average older and more experienced, they earn more than women. A considerable amount of the gender differences in earnings can be explained by differences between women and men in education, age and experience. What's left is called the indirect earning difference between women and men.

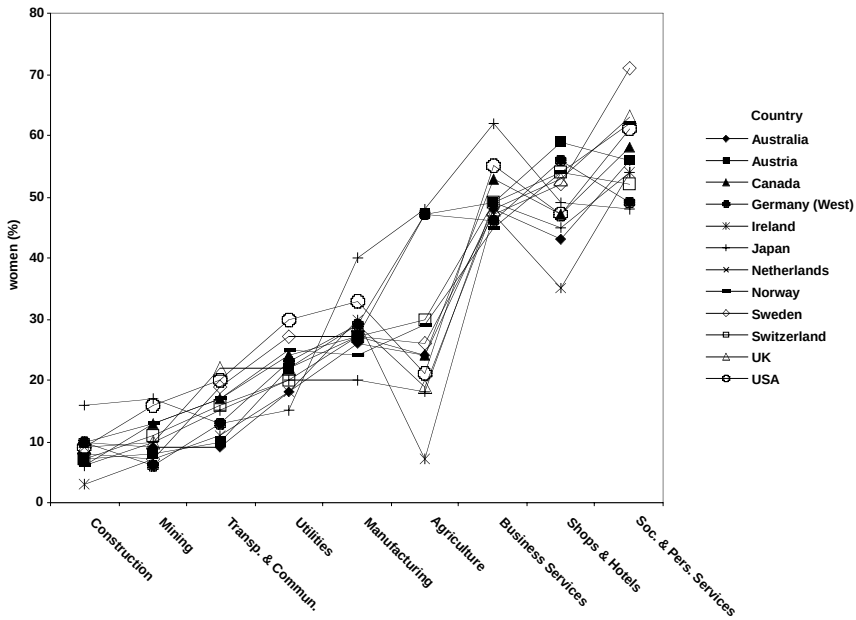
Economists often turn to labour supply and demand factors to explain the indirect difference in earnings between women and men (e.g. Cain, 1986; Killingsworth, 1985; Willis, 1986). According to the 'crowding' theory (Bergmann, 1974, 1989), in contrast to men, women are concentrated in a small number of occupations with a lot of supply and little demand. But even after controlling for these labour supply and demand factors, indirect earning differences still remain (England and Norris, 1985; Nakamura and Nakamura, 1989).

Research shows that much of this indirect earnings difference can be linked to differences between typical 'female' and 'male' jobs, even when actual job content is quite similar (Baron et al., 1991; Halaby, 1979; Rubery and Fagan, 1995; Wharton and Baron, 1987). Jobs more commonly held by women, such as those in care, cleaning and education, are usually less well paid than typical 'male' jobs, for example in technical and management areas. Although some authors, such as England (1981) and Beller (1984), claim that the integration of women and men in the labour market is increasing, others have challenged this claim, asserting that sex segregation remains strong, not only along occupational lines, but also along the lines of entire organizations and industries (Bielby and Baron, 1984; Reskin, 1988; Strober and Arnold, 1987).

A clear indication of the pervasiveness of sex segregation in the labour market can be obtained by comparing the sex ratio in different industrial sectors in a range of countries. In Figure 1 the percentage of employees who are women is shown for the major divisions of the International Standard Industrial Classification (ISIC) (United Nations, 1968), for 12 countries.[1] For the sake of expositional clarity, the divisions have been ranked in order of increasing percentage of women.

Figure 1 shows that, despite some differences between the 12 countries, there is a high degree of consistency in the pattern across all the countries. Although no sectors are really heavily dominated by female employment, in almost all the countries women are employed in comparable or somewhat higher numbers than men in the social services, shops and hotels and business services sectors. In Germany, Austria and Japan, women also form a large percentage in agriculture. In the other countries,

FIGURE 1
The Percentage of Employees Who are Women, by Industrial Sector and Country. *Sources*: OECD (1994a), ILO (1991).

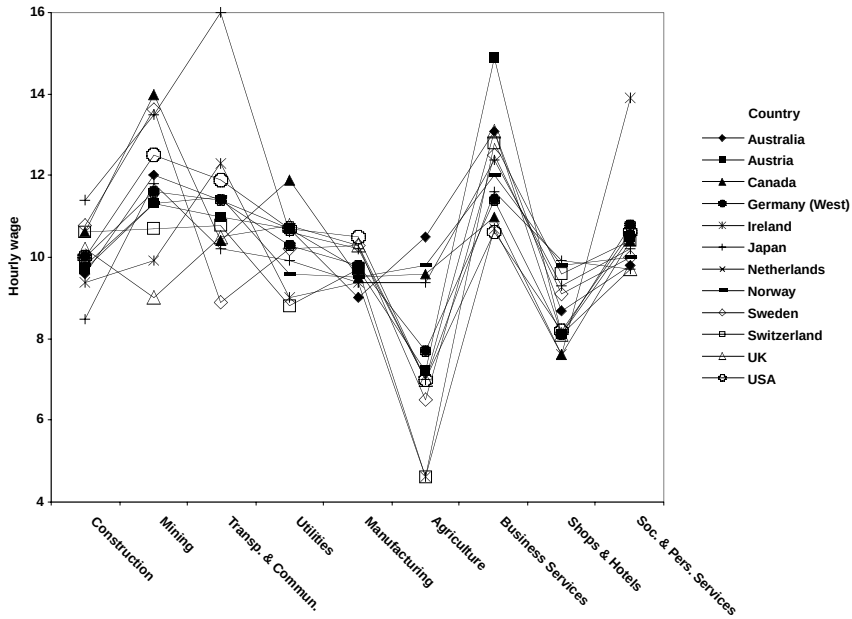


women are also employed in considerable numbers in this sector, and the same applies to manufacturing and somewhat less to transport and communication. Women are very much in the minority in mining, utilities and construction.

To see to what extent, if at all, these differences are reflected in differences in wage levels across industries, in Figure 2 the (relative) mean hourly wage level is shown for the different categories of industries in the 12 countries. To make comparison easier, the wages have been standardized to a mean level of 10 units in each country.

The picture thus obtained is less clear than that for the percentage of women, but still shows some consistencies. There does seem to be a general tendency for wages to decrease as we move from male-dominated sectors to sectors where women are more prevalent, although a number of industries do not fit the general pattern. Wages are relatively high in business services, despite the relatively high percentage of women employed in this sector. Conversely, wages are especially low in agriculture, which in the majority of countries is not a sector where women are particularly heavily represented. Similar, though less pronounced patterns of relatively high and relatively low wages can be observed in social services and construction respectively. These discrepancies are

FIGURE 2
Mean Wage Levels, by Industrial Sector and Country. *Source*: ILO (1991).



probably at least partly due to differences in levels of schooling of the workforce. In most countries, business services and social services are the sectors with the most highly educated workforce. Agriculture is usually characterized by low levels of schooling, while in construction the mean level of education is moderate at best.

This gives rise to the question of whether such sectoral wage differences indicate genuine wage segmentation, or whether they simply indicate different distributions across sectors of employee and work characteristics. Recent studies lend support to the former interpretation: considerable pay differences between industries persist, even when individual and work characteristics have been taken into account (e.g. Gibbons and Katz, 1992; Kreuger and Summers, 1988). Accordingly, the strong concentration of women in 'low-wage' industries may do more than reflect pay differences between women and men at the individual level. It may be that part of the gender pay difference results from the fact that women are more likely than men to work in low-wage industries.

In this article, we attempt to decompose wage differences between women and men into an individual and an industry-level component. To be more specific, we are looking for an answer to the following question: does the percentage of women working in an industry have an effect on earnings distinct from the effect of sex at the individual level?

In the next section, theoretical reasons for expecting a distinct sector-level effect of gender on wage levels are presented. On the basis of these arguments, which are to a large extent elaborations of the 'comparable worth' approach, it is hypothesized that the percentage of women working in an industry will have a negative effect on wage rates. In the third section the data and method used are described. The hypothesis is tested in the fourth section. In addition, a number of variables describing the respondent and her or his work context are added in an attempt to account for this effect. The article concludes with a brief summary and discussion of the results and their possible implications.

COMPARABLE WORTH AND WAGE BARGAINING

The idea that a high concentration of women influences the way in which work is evaluated has been well elaborated at the level of jobs and occupations in the 'comparable worth' approach (e.g. Davis and Moore, 1945). Treiman and Hartmann (1981) and Hartmann et al. (1985) have used this concept to explain the gender gap in earnings at that level: work predominantly done by women is valued less in society and for this reason rewarded less than equivalent work predominantly done by (white) men. Controlling for occupational skills and formal requirements, 'comparable worth' suggests that the higher percentage of women in an occupational group, the less the work will be perceived as deserving compensation, and consequently the lower the earnings will be. According to this theory, if all work, whether done by men or by women, was evaluated and thus rewarded according to the same objective criteria, the gender gap in earnings would no longer exist (Acker, 1989; Ames, 1995; Arthur Young Company, 1984; Dresang and Clauss, 1986). Recent research lends support to this contention. A negative relation between the percentage of women and average monetary reward has been found for jobs (Baron and Newman, 1989), occupations (Baron and Newman, 1989, 1990; England and Dunn, 1988; Solberg and Laughlin, 1995; Strober and Arnold, 1987) and organizations (Baron and Newman, 1990; Rosenbaum, 1985), and has been reproduced using both longitudinal and cross-sectional data. In this study we extend this by examining the relation between the percentage of women and wage rates at the level of industrial sectors. This extension is important since a large amount of wage bargaining takes place at this higher level, as the aforementioned sectoral wage differentials testify.

Baxter (1980) has drawn attention to the link between dissatisfaction with pay levels and bargaining power in wage negotiations. Dissatisfaction in turn depends on the comparison between perceived entitlements and actual wages received. The 'comparable worth' approach leads us to expect that perceived entitlements will not only depend on objective

criteria such as skills and responsibility, but also on generally held preconceptions and prejudices about the relative value of work in female-dominated and male-dominated sectors. The biased perceptions about the value of different types of work are likely to be shared to a large extent by employers and employees alike (Morrison and von Glinow, 1990; Ragins and Sundstrom, 1989), and could severely undermine the bargaining position of workers in certain industries relative to those in others. Bargaining power in female-dominated industries is likely to be further undermined by a general difference in labour market orientations of women and men. Whereas men depend heavily on a paid career as a source of income and social approval, in modern societies women still have a legitimate alternative in the role of housewife (see, for example, Carrier, 1995; Sanders, 1991, 1995). This may make women more willing to accept work in low-wage industries, and less assertive in wage-bargaining processes. In addition, the perceived lower commitment to the labour market will further undermine the perceived value of the work being done. This all implies that the relatively low wages usually found in female-dominated industrial sectors could at least in part be attributable to a general consensus that the services being offered are somehow 'less essential', and therefore less deserving of compensation than work in more technical or managerial industrial sectors. In public discussions in the political arena and in the media, the importance of the latter sectors for the national economy are frequently stressed, while the former sectors are often portrayed as a burden on the taxpayer.

On the basis of the preceding arguments, we formulate the following hypothesis: *controlling for education, experience and sex, the higher the percentage of women in an industry, the lower the earnings.*

This hypothesis appears to imply that the effect of the percentage of women is linear and applies more or less equally to men and women. The theory as elaborated need of course imply no such thing. It suggests only that employers avoid overt wage discrimination at the individual level while still paying women in general less than men. This general statement can be reconciled with various kinds of patterns. For example, it may be that the percentage of women only has an effect once a certain threshold has been exceeded. It also seems reasonable to ask whether women and men bear the brunt of this effect equally. In her book *Men and Women of the Corporation*, Kanter (1977) explains why tokens (members of a minority representing fewer than 15 percent of the total) face special situations and special problems. The special problems addressed are associated with perceptual tendencies which are derived from the way any set of objects are perceived. According to this line of reasoning, the percentage of women may not only effect overall wage levels, but also wage differentials between men and women.

It is unclear, on the basis of theory, what the nature of threshold effects

and effects on wage differentials are likely to be. It would therefore be premature to formulate specific hypotheses about these effects. However, it is relatively simple to take account of the possibility of such effects by including the percentage of women in the analyses not only as a linear term, but also as a quadratic term and also an interaction between percentage of women and sex as an individual-level variable.

DATA AND METHOD

To test the aforementioned hypotheses we used data from a number of national and international data sets. In total 11,251 respondents, 438 industries and 12 countries are included in this data set. Consequently, there was an average of about 37 industries and almost 1000 respondents per country, and about 25 respondents per industry. The data sets are approximately representative for the countries included: Australia, Austria, Canada, Germany, Ireland, Japan, the Netherlands, Norway, Sweden, Switzerland, the UK and the USA. Across all the countries, 39 percent of the respondents were women, varying from 33 percent in Ireland to 45 percent in Sweden and the USA (see Table 2 for the sex ratio in the other countries). Table 1 summarizes the main characteristics of the data used.

In the ensuing analyses, as is customary in earnings models, we use the natural logarithm of wages as dependent variable, rather than simply the wage itself. This is done because the distribution of wages in the population is frequently heavily skewed. It also makes it possible to interpret the estimated coefficients in terms of percentage increase in wages. To

TABLE 1
Individual-Level Data for Analyses

Country	Source data set	Year	Number of cases for analyses
Australia	Australian National Social Science Survey	1984	1413
Austria	International Social Science Programme	1989	777
Canada	Wright Project	1982	1729
Germany (West)	Wright Project	1985	1275
Ireland	International Social Justice Project	1989	449
Japan	International Social Justice Project	1991	373
Netherlands	Dutch Family Survey	1992	1039
Norway	Wright Project	1982	1342
Sweden	Wright Project	1980	820
Switzerland	International Social Justice Project	1987	583
UK	International Social Science Programme	1989	645
USA	International Social Science Programme	1989	806

TABLE 2
Some Statistics Concerning the Position of Women Relative to Men in the Labour Market in 12 Countries

Country	Female workers (%)	Part-time		Mean scores of working women (working men = 100)			
		Women (%)	Men (%)	Education	Age	Experience	Wages
Australia	38	32	2	98	94	92	76
Austria	41	19	3	97	96	96	86
Canada	41	24	6	105	92	87	69
Germany (West)	40	22	1	95	93	92	75
Ireland	33	21	5	106	85	77	72
Japan	41	37	2	96	93	92	50
Netherlands	40	45	3	102	92	89	84
Norway	42	43	4	101	97	96	82
Sweden	45	32	3	104	99	97	85
Switzerland	37	15	1	96	85	82	65
UK	44	37	2	93	103	107	68
USA	45	18	9	96	100	102	71

Note: Figures cited correspond to year of survey data used in this article.
Sources: Labour Force Statistics (OECD, 1994b); and individual survey data (see Table 1).

avoid having to address the problem of the considerable country-level variation in wages, which is of no importance to our research question, prior to taking the logarithm of the wage we transformed this variable (multiplied it by a constant) within each country to give a mean wage of 10. For level of education the number of years normally required to complete a given level of schooling is used. The mean years of schooling across all the countries is 11.4, varying from 8.8 in Sweden (in 1980: this has probably increased since then) to 13.5 in the USA. The mean age of respondents across all countries is 38.6, varying from 36 years in Australia and Austria to 44 years in Japan. In the analyses, work experience rather than age is appropriate as a control variable, since in general wages can be expected to increase in proportion to the time spent in employment, and not automatically in proportion to age. Work experience has been estimated by subtracting the respondent's level of schooling from her or his age in years. Both a linear and a quadratic experience term has been included, to capture the frequently observed pattern of wages increasing initially as an individual's career progresses, but flattening out after mid-career. It is likely that this measure overestimates the actual work experience of women, since women are generally more likely to experience career interruptions than men. To reflect this, an interaction between sex and experience is also included in the analyses. Additional individual variables used in the analyses were job tenure (years in current job), and

dummies for marital status (married = 1, not married = 0) and union membership (member = 1, non-member = 0).[2] For each of these variables an interaction with sex was also included.

A number of sector-level variables were also used. The percentage of women in an industry was estimated by simply aggregating the individual-level variable sex to the industry level. Both a linear and a quadratic version of this variable were included in the analyses. Mean firm size was calculated by dividing total employment by the number of firms per sector, mainly on the basis of statistical source material (OECD, 1994a), supplemented where necessary by aggregated information from the survey data. In addition, the product of sex at the individual level and both these variables (so-called 'cross-level interactions') were also included.

Since we are not primarily interested in differences between the countries, no variables or country dummies have been included at that level. There were two main reasons for including more than one country in the analysis. The main reason was to increase statistical power at the sector level. With fewer than 40 sectors distinguished within most countries, a specific sector-level effect of gender would need to be very strong in order to be clearly visible above the 'noise' which is necessarily contained in data of this kind. The second reason for using a range of countries is that it increases the generalizability of the results.

Table 2 shows the sex ratio in employment in the 12 countries, the proportion of women and men in part-time employment, as well as the mean hourly wage, years of education, age and experience of working women in those countries, relative to those of working men.

As already mentioned, the overall participation of women is lower than that of men in all the countries. More striking is the difference between women and men in the percentage working part-time. In all countries only a small minority of men work part-time, whereas a large percentage of women do so. This is especially the case in the Netherlands, Norway, Japan and the UK. There is virtually no difference in most of the 12 countries between working women and men in mean level of schooling, and generally only quite modest differences in the mean age and experience of men and women in employment. This contrasts sharply with the large differences in wage levels between men and women in all of the countries. Only in four of the countries do women's wages exceed four-fifths of men's wages on average, and in Japan women earn just half what men do.

For the analyses, we employed a three-level hierarchical design, with individual employees nested in industries, which are in turn nested in the 12 countries. A two-level baseline model, involving only the individual and country levels, was also estimated for purposes of comparison. Use was made of the statistical program VARCL (Longford, 1988). VARCL (Variance Component Analysis) is one of a number of programs currently available which make use of an algorithm to partition variance between

different nested aggregation levels. The technique is comparable to multiple regression, but containing more than one aggregation level. In addition to the dependent variable, the effects (coefficients) of some or all of the independent variables can also vary randomly at higher aggregation levels. Subsequently, explanatory variables can also be included at higher levels to explain this higher level variance. Main effects of higher level variables are then included to account for higher level variance in the dependent variable. Cross-level interactions (products of higher and lower level terms) can be included to explain higher level variance in the lower level coefficients.

RESULTS

The central hypothesis in this article postulates that the percentage of women in an industry will have a negative effect on wages net of the effect of individual characteristics. The relevant results for the testing of this hypothesis are presented in Table 3.

In order to obtain a clearer view of the effects at the sector level, we first estimated a two-level model distinguishing only individuals and countries as a baseline for comparisons (model 0). At the individual level, the (fixed) effect of sex, education, experience (both a linear and a quadratic term) and the interaction of sex and experience on the log of wages has been estimated. In order to obtain coefficients with a comparable order of magnitude for presentation in the table, education and experience (including the quadratic and interaction terms) were divided by 10 prior to the analyses. This means that the coefficients represent the effect of 10 years of education and experience respectively. The intercept and sex coefficient also vary randomly at the country level. This was necessary to avoid confounding country-level with industry-level variance in wages and in the effect of sex on wages. In this model, the explanatory variables all show strongly significant effects corresponding to what has generally been found in earlier research. The negative coefficient for sex shows that women generally earn only about 77 percent of what men earn when education and experience has been taken into account. Education and experience both contribute positively to wages, but the effect of experience levels off later in the career, as the negative quadratic term shows. The interaction between sex and experience is also negative, which probably mainly reflects the fact that experience is overestimated for women.

The sector level has been added in model 1. With the exception of the sex by experience interaction term, all the individual-level coefficients as well as the intercept have also been allowed to vary randomly at the industry level.[3] The change in deviance can be used as a test of improvement in

TABLE 3
Results of a Multi-Level Analysis to Test Hypothesis: Dependent Variable is the Natural Logarithm of Wages [ln(wage)]

Parameters	Model 0	Model 1	Model 2	Model 2a
Fixed terms				
Individual level				
Sex	−.23**	−.23**	−.22**	−.21**
Education	.51**	.44**	.44**	.44**
Experience	.28**	.26**	.26**	.26**
Experience^2	−.07**	−.06**	−.06**	−.06**
Sex – experience	−.02**	−.03**	−.03**	−.03**
Sector level				
% Women			−.11**	−.12*
(% Women)^2				−.05
Sex – (% Women)				.03
(Constant)	.93	.87	.90	.90
Random variances				
Sector level				
Constant		.022**	.020**	.020**
Sex coefficient		.018**	.018**	.018**
Country level				
Constant	.025**	.022**	.023**	.023**
Sex coefficient	.036**	.029**	.030**	.030**
Deviance	22365	21992	21987	21987
ΔDeviance		373**	5*	0

Notes: * significant at 5 percent; ** significant at 1 percent.

model fit by means of a chi-square test. In this case, the decrease in deviance of 373, associated with 9 degrees of freedom (the five extra variance terms plus the covariances between the intercept and the effects of sex and the other three control variables) is highly significant. Although this model thus appears to fit the data much better than model 0, surprisingly little changes in most of the parameters estimated. Only the education coefficient is reduced appreciably, suggesting that a considerable part of the effect of education is a between-industry effect. The sex coefficient remains unchanged. This suggests that to the extent that the percentage of women in an industry has an effect on wages, this effect is independent of the individual-level effect of sex.

To test the hypothesis, it is necessary to further extend the model by introducing at the industry level a variable indicating the percentage of employees who are women. This has been done in model 2. The hypothesis predicts that this variable will have a negative effect on wages when

the effect of education, experience and sex have been controlled for at the individual level. For presentational purposes, the percentage of women has been divided by 100 prior to the analyses. The effect of the percentage of women on wages is highly significant. An additional 1 percent of women in an industry is accompanied by 0.11 percent decrease in wages. The addition of this variable significantly improves the model fit. However, this has almost no effect on the individual-level sex coefficient. Nonetheless, this result does support our first hypothesis, which stated that controlling for education, experience and sex, the higher the percentage of women in an industry, the lower the earnings. In other words, individuals working in female-dominated industries can expect to receive lower wages in general than comparable individuals working in male-dominated industries. This effect is neither caused by, nor causes, the effect of sex at the individual level.

In model 2a the quadratic term and the cross-level interaction between sex at the individual level and the percentage of women at the sector level have been included. Neither of these effects were significant, and no improvement in model fit was obtained. We conclude that the effect of the percentage of women can be adequately captured by a linear term. The non-linear and interaction terms were therefore omitted from subsequent analyses.

We mentioned earlier that an important consideration in including such a range of countries in the analyses was to increase the generalizability of our results. It is therefore appropriate to ask to what extent these results apply to all the countries. Initially, country-level variance terms for both the linear and quadratic versions of the '% women' coefficient, as well as the sex by '% women' interaction, were included in the analyses. These variance terms all proved non-significant, suggesting that these effects do not differ significantly between countries. As an additional check on the linear effect, the so-called 'posterior means' for this coefficient were inspected. These are the country-specific deviations from the overall mean effect of the variable. By adding these to the overall mean, the effect of the percentage of women could be obtained per country. All of the resulting scores were negative. In other words, the effect of the percentage of women in an industry is negative in all 12 countries. All three variance terms were therefore omitted from the analyses as presented.

We can attempt to shed some light on the possible reasons for the effect of the percentage of women in an industry by including some additional variables describing the respondents and their work situation. If any or all these variables are differently distributed between female-dominated and male-dominated industries, this may help account for the effect of the percentage of women in an industry. These further analyses are summarized in Table 4. Model 2 is included once again, as a basis for comparison.

To begin with, model 2 is extended by including marital status. In

TABLE 4
Results of a Multi-Level Analysis with Personal and Context Variables: Dependent Variable is the Natural Logarithm of Wages [ln(wage)]

Parameters	Model 2	Model 3	Model 4	Model 5
Fixed terms				
Individual level				
Sex	−.22**	−.20**	−.20**	−.16**
Education	.44**	.43**	.45**	.44**
Experience	.26**	.24**	.23**	.23**
Experience^2	−.06**	−.06**	−.06**	−.06**
Sex – experience	−.03**	−.01*	−.01*	−.02**
Married		.01	.01	.01
Sex – married		−.06**	−.06**	−.06**
Union member			.13**	.15**
Job tenure			.04**	.06**
Sex – union member				.03**
Sex – tenure				.05**
Sector level				
% Women	−.11**	−.11**	−.07*	−.08*
Mean firm size (× 100)			.04**	.06**
Sex – mean firm size				.03**
(Constant)	.90	.93	.82	.79
Random variances				
Sector level				
Constant	.020**	.019**	.015**	.014**
Sex coefficient	.018**	.019**	.018**	.011**
Country level				
Constant	.023**	.023**	.015**	.015**
Sex coefficient	.030**	.028**	.028**	.023**
Deviance	21987	21905	21756	21721
ΔDeviance	5*	79**	149**	35**

Notes: * significant at 5 percent; ** significant at 1 percent.

addition to the main effect of this variable, we have included the interaction with sex in model 3. In general, we have no reason to expect this variable to affect wages across the board. However, recent research indicates that being married can have a negative effect on the labour market position of women, directly because it often implies competing demands on women's time and energy, and indirectly because it may sow doubts in the minds of prospective employers as to the degree to which women are sufficiently committed to a long-term career to warrant the risk of appointing or promoting them to core positions (Sanders, 1991). For men on the other hand, being married is more likely to signal responsibility

and a stable career orientation. For this reason, we would expect being married to depress the wages of women, and possibly even raise those of men. This is confirmed by the results. The main effect of marital status is small and non-significant. By contrast, the interaction between sex and marital status is negative and highly significant. The model fit is also improved considerably. The conclusion is clear: whereas there is no overall effect of marital status on wages, women are 'penalized' for being married while men appear to be 'rewarded'. However, the inclusion of these effects contributes little or nothing towards accounting for the effects of either the percentage of women or sex as individual variable.

In model 4, the effect of a number of work-related variables has been included. These variables are: union membership, job tenure and mean firm size in an industry. All three of these variables are positively related to wages, and their inclusion improves the model fit considerably. This suggests that being a union member, having a more stable employment record and working in a sector characterized by large firms improves one's chances of receiving a higher wage. More importantly for our purposes, these variables also account for a considerable part of the effect of the percentage of women in an industry. Alternate omission of these variables (not reported here) revealed that it was especially union membership and mean firm size which were responsible for this. It would appear that the lower wages in female-dominated industries are at least partly due to the fact that these industries are less unionized, and more characterized by small firms, than sectors where men are more in the majority. However, not all of the effect of the percentage of women is accounted for by these variables.

As a final step, the interaction of sex with these work-related variables has been included, in model 5. Once again, all three of these interactions are highly significant, and the model fit is improved. Interestingly, all three of the interactions are positive. It appears that women benefit more than men from being a union member, having a more stable employment record and working in sectors dominated by large firms. Against this background, it is not really surprising that the inclusion of these interactions actually slightly *increases*, rather than decreases, the estimated effect of the percentage of women in an industry.

CONCLUSION

In this article we gave attention to the gender gap in earnings on the level of industries. We examined the question: does the percentage of women working in an industry have an effect on earnings distinct from the effect of sex at the individual level? Our hypothesis, based on the theory of 'comparable worth', was confirmed: controlling for education, experience

and sex, the higher the percentage of women in an industry, the lower the earnings was confirmed using data from 12 countries. This effect appeared to be roughly linear, and to hold more or less equally for both women and men. The effect can neither be explained by, nor does it explain, the effect of sex at the individual level. Although women earn considerably less than men across the whole range of industries, in female-dominated industries both women and men are disadvantaged.

Inclusion of a number of additional personal and work-related variables in the analyses accounted for some, though not all, of the effect of the percentage of women in an industry. Differential effects for women and men of marriage on wages were found, but did not account for any of the sector-level effect. By contrast, the significant positive effects of union membership and mean firm size did account for part of the effect of the percentage of women in an industry. This confirms the impression that female-dominated industries are more peripheral than male-dominated industries, with low union representation and generally relatively small organizations. Although job tenure was also positively related to wages, this variable did not appear to account for much of the effect of the percentage of women.

NOTES

The authors would like to thank the members of the ICS 'labour market' group for their comments on an earlier version of this article.

1. The full titles of these divisions are (abbreviated title in parentheses):

    1. Agriculture, hunting, forestry and fishing (agriculture);
    2. Mining and quarrying (mining);
    3. Manufacturing (manufacturing);
    4. Electricity, gas and water (utilities);
    5. Construction (construction);
    6. Wholesale and retail trade and restaurants and hotels (shops & hotels);
    7. Transport, storage and communication (transp. & commun.);
    8. Financing, insurance, real estate and business services (business services);
    9. Community, social and personal services (soc. & pers. services).

2. Since women are much more often engaged in part-time work than men (see Table 2), it would have been interesting to examine the effect of this on the results. Oddly, in the data the mean hourly wages of part-time and full-time workers appeared to differ very little. This may be related to the way in which the dependent variable has been constructed: total earnings divided by hours worked. Inspection of the data revealed that extremely low wages were relatively frequently observed for individuals who worked a lot of hours, and extremely high wages for individuals who worked few hours. This could indicate that for hours worked the extremes have been exaggerated, for example because the respondent reported hours worked in the

most recent week rather than average hours. For this reason, we decided not to use the variable 'part-time' in the analyses. This should have little effect on our results. In fact, since part-time working is positively correlated with the percentage of women in an industry, this probably means that the effect of percentage of women is actually underestimated in our analyses.

3. To avoid unnecessary cluttering, not all the parameters estimated for Tables 3 and 4 have been presented. Sector-level variances in the coefficients for education, experience, experience^2, married, union and sex – union, as well as covariances between the slopes and the grand mean at both the sector and country levels, were included in the analyses but omitted from the tables.

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