INTER-INDUSTRY WAGE DIFFERENTIALS AND THE GENDER WAGE GAP: EVIDENCE FROM EUROPEAN COUNTRIES

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Abstract

This study analyses the interaction between inter-industry wage differentials and the gender wage gap in six European countries using a unique harmonised matched employer-employee data set, the 1995 European Structure of Earnings Survey. Findings show the existence of significant inter-industry wage differentials in all countries for both sexes. While their structure is quite similar for men and women and across countries, their dispersion is significantly larger in countries with decentralised bargaining. These differentials are significantly and positively correlated with industry profitability. The magnitude of this correlation, however, is lower in countries with centralised and coordinated collective bargaining. Further results show that in all countries more than 80% of the gender wage gaps within industries are statistically significant. Yet, industries having the highest and the lowest gender wage gaps vary substantially across European countries. Finally, results indicate that industry effects explain between 0 and 29% of the overall gender wage gap.

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Introduction

The existence of sectoral effects on workers' wages is well documented in the economic literature (Arai *et al*. 1996; Krueger and Summers 1988; Lucifora 1993; Rycx 2002; Vainiomäki and Laaksonen 1995). Although their exact scale is still questionable (Abowd *et al.* 1999; Björklund *et al.* 2004; Gibbons and Katz 1992; Goux and Maurin 1999), there is some agreement on the fact that these effects are fairly persistent, closely correlated from one country to another (Helwege 1992), and of varying dimensions in the industrialised countries (Hartog *et al.* 1997). A number of studies suggest in addition that sectoral effects are significantly weaker in strongly corporatist countries (Edin and Zetterberg 1992; Hartog *et al.* 1999; Kahn 1998; Rycx 2003; Teulings and Hartog 1998; Zanchi, 1992; Zweimüller and Barth 1994). Cross-country comparisons of inter-industry wage differentials must, however, be considered with caution. The point is that results obtained for different countries are seldom strictly comparable because of differences in the specification of the wage equation, the sectoral nomenclature used, the field covered by the data, or the period under investigation. Moreover, while various explanations based on efficiency wage mechanisms or rent sharing have been put forward (Benito 2000; Krueger and Summers 1988 ; Lindbeck and Snower 1990; Thaler 1989; Walsh 1999), the existence of industry wage differentials remains a complex and unresolved puzzle.

Since Becker's (1957) seminal paper on the economics of discrimination, studies on the magnitude and sources of the gender wage gap have proliferated (Bayard *et al.* 2003; Blau and Kahn 2000; Groshen 1991; OECD 2002). Yet, it is surprising to observe that the evidence regarding the interplay between gender wage gaps and inter-industry wage differentials is limited. The main contribution to this field of study has been provided by Fields and Wolff

(1995). Using the 1988 U.S. Current Population Survey, the authors find significant industry wage differentials for women and men, after controlling for productivity-related individual characteristics. These differentials are highly correlated and their dispersion is of the same order of magnitude for both sexes. In spite of these similarities, the authors report significant gender wage gaps within industries. Moreover, their results suggest that around one-third of the overall gender wage gap is explained by industry effects. While thorough and convincing, this study has several shortcomings: i) the standard errors of the inter-industry wage differentials are wrong (Haisken-DeNew and Schmidt 1997; Reilly and Zanchi 2003), ii) the industry wage gaps are not identified (Horrace and Oaxaca 2001), and iii) the level of significance of the different components of the gender wage gap is not reported (Oaxaca and Ransom 1998). Furthermore, to our knowledge, the studies of Edin and Richardson (2002) and Rycx and Tojerow (2002), respectively on Sweden and Belgium, provide the only comparable analyses for European countries.

This paper attempts to fill this gap by examining the interaction between the inter-industry wage differentials and the gender wage gap in six European countries, i.e. Belgium, Denmark, Ireland, Italy, Spain, and the U.K. To do so, we use a unique harmonised matched employer-employee data set, the 1995 European Structure of Earnings Survey. As far as we know, this paper is the first to examine with recent techniques, on a comparable basis, and from a European perspective: i) inter-industry wage differentials by gender, ii) gender wage gaps by industry, and iii) the contribution of industry effects to the overall gender wage gap. It is also one of the few, besides Kahn (1998), to analyse for both sexes the relationship between collective bargaining characteristics and the dispersion of industry wage differentials. Finally, it adds to existing literature by examining, separately for male and female workers, to what extent industry wage differentials are correlated to industry profitability.

Description of the Data

The present study is based on the 1995 European Structure of Earnings Survey, gathered by Eurostat. This harmonised survey, covering six European countries, contains a wealth of information, provided by the management of the establishments, both on the characteristics of the latter (e.g. sector of activity, number of workers, level of collective wage bargaining, region) and on the individuals they employ (e.g. age, level of education, tenure, gross earnings, paid hours, sex, occupation, bonuses). It is representative of all establishments employing at least ten workers and whose economic activities fall within sections C to K of the Nace Rev. 1 nomenclature[1], except for Ireland where sectors F, I and K are not covered.

[Insert Table 1]

Table 1 depicts the means and standard deviations of selected variables for women and men. We note a clear-cut difference between the average characteristics of male and female workers in all countries. The point is that on average men earn significantly higher wages, have more seniority and prior potential experience (except in Denmark and the U.K.), work a larger number of hours, more frequently have a permanent contract, and are employed in larger establishments (except in Denmark and Ireland).

Inter-Industry Wage Differentials by Gender

The methodology adopted to estimate the inter-industry wage differentials by gender is consistent with that of Krueger and Summers (1988). However, the standard errors of these differentials have been corrected according to Haisken-DeNew and Schmidt (1997).

For each country and for both sexes, the following semi-logarithmic wage equation has been estimated by ordinary least squares (OLS):

$$\ln(W_i) = \alpha + \sum_{j=1}^{J} \beta_j X_{j,i} + \sum_{k=1}^{K} \psi_k Y_{k,i} + \sum_{l=1}^{L} \delta_l Z_{l,i} + \varepsilon_i \qquad (1)$$

where $\ln(W_i)$ represents the Naperian logarithm of the gross hourly wage of the individual i; X is the vector of the individual characteristics of the workers and their working conditions (5 indicators showing the highest completed level of education; prior potential experience, its square and its cube; seniority within the establishment and its square; a dummy variable controlling for entrants, i.e. individuals with no seniority; number of hours paid; a dummy for extra paid hours; 20 occupational dummies; regional dummies indicating where the establishment is located[2], 3 dummies for the type of contract, and an indicator showing whether the individual is paid a bonus for shift work, night-time and/or weekend work; Y includes 41 dummy variables indicating the sectoral affiliation of the workers[3]; Z contains employer characteristics (the size of the establishment[4] and the level of wage bargaining); α is the intercept; ψ, β and δ are the parameters to be estimated; and ε_i is an error term.

Table 2 reports the estimates of the industry wage differentials for male and female workers in six European countries. These are shown as deviations from the employment-weighted mean. Table 2 also records the range and the weighted adjusted standard deviation of the inter-industry wage differentials (WASD).

[Insert Table 2]

Results in Table 2 show that, in all countries and for both sexes, wage differentials exist between workers employed in different sectors, even when controlling for working conditions, individual and firm characteristics. F-statistics reveal that the industry dummy variables are always jointly significant (at the .01 level). Depending on sex and the country considered, we also find that between 57 and 90% of the industry wage differentials are significantly different from zero (at the .10 level). Moreover, we note that the hierarchy of the sectors in terms of wages is quite similar for male and female workers[5] and across countries (see Table 3). Among the best paid sectors, we find the financial sector, the coking, refining and nuclear industry, the tobacco industry, and the production and distribution of electricity, gas, steam and hot water. Furthermore, wages are lowest in the traditional sectors (hotels and restaurants, the textile industry, and retailing).

[Insert Table 3]

Yet, the apparent similarity between industry wage differentials for male and female workers is challenged by standard statistical tests. Indeed, simple t-tests, reported in Table 2, show that between 43 and 71% of the industry wage disparities are significantly different (at the .10 level) for women and men. Moreover, Chow tests indicate that sectoral wage differentials are significantly different (at the .01 level) as a group for both sexes in all countries.

If we look at the dispersion of industry wage differentials (i.e. the range and the WASD), we find that results vary for men and women, although not systematically nor substantially (except for the range in Ireland). Yet, the dispersion of industry wage differentials fluctuates considerably between countries. For both sexes, we note that the range and the WASD of the

industry wage differentials are quite large in Ireland, Italy and the U.K., and relatively moderate in Belgium, Denmark and Spain.

[Insert Table 4]

Table 4 reports the correlation coefficients between the WASD of the industry wage differentials and collective bargaining characteristics, i.e. the degree of centralisation, the degree of coordination among the social partners, the trade union coverage rate, and trade union density.[6] For both sexes, results show the existence of a significant (at the .05 level) and negative relationship between the degree of centralisation of collective bargaining and the dispersion of industry wage differentials. To put it differently, results suggest that industry wage differentials for male and female workers are more dispersed in countries where wages are essentially bargained at the firm or establishment level.[7] Our results fit in nicely with earlier findings reported by Kahn (1998) for one-digit industries in the U.S. and several European countries (i.e. Austria, Britain, West Germany, Norway and Sweden) in the 1980s.

[Insert Table 5]

In order to get some additional insight into the nature of these industry wage differentials, we have confronted them with industry profitability at the Nace two-digit level. Data on profitability have been taken from the European Structure of Business Survey. It is a large harmonised data set containing information on financial variables such as sales, value of production, and value of acquired goods and services. Industry profitability has been estimated by the industry gross operating surplus per worker. Findings, presented in Table 5, show the existence of a substantial, positive and significant (at the .01 level) relationship

between industry wage differentials and industry profitability (except in Denmark). These results suggest that the inter-industry wage differentials derive at least partially from inter-industry variations in the ability-to-pay. To put it differently, they appear to be consistent with explanations based either on efficiency wage mechanisms or on rent sharing.[8]

[Insert Table 6]

Finally, we have analysed whether the magnitude of the correlation between industry wage differentials and industry profitability depends upon collective bargaining characteristics. Findings, reported in Table 6, show that the magnitude of this correlation is significantly lower, for both male and female workers, in countries with centralised and coordinated collective bargaining.[9] Results thus suggest that industry wage differentials are more sensitive to the sectoral ability-to-pay in decentralised and poorly coordinated wage setting environments.

Gender Wage Gaps by Industry

In this section, gender wage gaps within industries are estimated using the methodology developed by Horrace and Oaxaca (2001). According to this methodology, the gender wage gap in a particular sector can be defined as follows:

$$HO_k = (\hat{\psi}_k^f - \hat{\psi}_k^m) + (\hat{\alpha}^f - \hat{\alpha}^m) + \sum_{j=1}^{J} \overline{X}_j^f (\hat{\beta}_j^f - \hat{\beta}_j^m) + \sum_{l=1}^{L} \overline{Z}_l^f \left(\hat{\delta}_l^f - \hat{\delta}_l^m\right) \qquad (2)$$

where the index k identifies the sector and superscripts f and m represent female and male workers, respectively. $(\hat{\alpha}^f - \hat{\alpha}^m)$ is the difference between the estimates of the intercepts in the female and male wage regressions and $(\hat{\psi}_k^f - \hat{\psi}_k^m)$ is the difference between the regression coefficients associated to the k^{th} industry dummy for women and men, $\overline{X}^f$ is the vector of mean female individual characteristics and working conditions, and $\overline{Z}^f$ contains mean characteristics of female workers' employers. β and δ are the vectors of regression coefficients.

By including the mean characteristics of female workers and the difference between female and male coefficients, equation (2) overcomes the identification problem encountered by Fields and Wolff (1995).[10] It shows how a randomly selected female worker would do if she were treated as a man with the same characteristics. For this reason, it is also referred to as the identified wage gap evaluated at the mean characteristics of all women in the sample.

[Insert Table 7]

Table 7 shows gender wage gaps for two-digit industries. Independently of the country considered, we find that more than 80% of the gender wage gaps within industries are statistically significant (at the .10 level). The average industry gender wage gap ranges between -.18 in the U.K. and -.11 in Belgium. This means that on average women have an inter-industry wage differential of between 18 and 11% below that for men. Regarding the dispersion of the industry gender wage gaps (i.e. the range and standard deviation), we note

that it is relatively high in Italy, Ireland, and the U.K. and more compressed in Belgium, Denmark, and Spain.

[Insert Table 8]

Finally, Table 8 shows that the correlation coefficients between the industry gender wage gaps across countries are relatively small and often statistically insignificant. This result suggests that industries with the highest and the lowest gender wage gaps vary substantially across European countries. The smallest gender wage gaps are found in the dry hire industry (in Belgium and Italy), the clothing and fur industry (in Denmark and Spain), the tobacco industry (in the U.K.), and the mining of metal ores (in Ireland). In contrast, the pulp and cardboard industry (in Belgium), the land-based transport industry (in Denmark), the recovery of recyclable materials industry (in Ireland), the sector of financial auxiliaries (in Italy and the U.K.), and the food industry (in Spain) are characterised by the largest gender wage gaps.

Decomposition of the Overall Gender Wage Gap

To complete our analysis, we have decomposed the overall gender wage gap in order to assess what proportion is due to: (a) differences in the distribution of male and female workers across sectors, (b) differences by gender in the structure of industry wage premia, and (c) differences by gender in all other factors, i.e. intercepts, working conditions, individual and firm characteristics. Therefore, we applied the Oaxaca (1973) and Blinder (1973) decomposition technique as follows:

$$\overline{\ln W_i^m} - \overline{\ln W_i^f} = \sum_{g=1}^{G} \overline{\hat{\lambda}}_g \left(\overline{V}_g^m - \overline{V}_g^f \right) + \sum_{g=1}^{G} \overline{V}_g \left(\hat{\lambda}_g^m - \hat{\lambda}_g^f \right) + \sum_{k=1}^{K} \overline{\hat{\psi}}_k \left(s_k^m - s_k^f \right) + \sum_{k=1}^{K} \overline{s}_k \left(\hat{\psi}_k^m - \hat{\psi}_k^f \right) \quad (5)$$

where the superscripts *m* and *f* refer to male and female workers respectively; $\overline{\ln W}$ represents the average (Naperian logarithm) of the hourly wage; $\overline{V}$ is a vector containing the mean values of the intercept, working conditions, individual and firm characteristics; s_k is the share of employment in sector *k*; $\hat{\lambda}$ and $\hat{\psi}$ are the regression coefficients associated respectively to vector V and the industry dummy variables; $\overline{\hat{\lambda}}_g = \left(\hat{\lambda}_g^m - \hat{\lambda}_g^f\right)/2$; $\overline{\hat{\psi}}_k = \left(\hat{\psi}_k^m - \hat{\psi}_k^f\right)/2$; and $\overline{s}_k = \left(s_k^m - s_k^f\right)/2$.

[Insert Table 9]

Table 9 shows that the overall gender wage gap, measured as the difference between the mean log wages of male and female workers, ranges from .18 in Denmark to .39 in the U.K. This means that the average female worker respectively earns between 82 and 61% of the mean male wage. Further results indicate that in all countries a significant (at the .01 level) part of the overall gender wage gap can be explained by differences in the distribution of male and female workers across sectors. Yet, the relative contribution of this factor to the gender wage gap varies substantially among European countries. It is close to zero in Belgium and Denmark, between 7 and 8% in Ireland, Spain and the U.K., and around 16% in Italy. Besides, findings suggest that differences by gender in the industry wage premia do not significantly contribute to the overall gender wage gap in Belgium, Italy and the U.K. In contrast, these differences would account respectively for 14 and 20% of the gender wage gap in Denmark and Ireland. The result for Spain is more surprising since it is negative and quite substantial (about -8%). However, it should be interpreted with caution since it is only significant at the .10 level. Overall, we find that combined industry effects explain around

29% of the overall gender wage gap in Ireland, respectively around 14% and 16% in Denmark and Italy, around 7% in the U.K. and almost no share in Belgium and Spain.

Conclusions

In this paper we have examined the interaction between inter-industry wage differentials and the gender wage gap in six European countries, i.e. Belgium, Denmark, Ireland, Italy, Spain, and the U.K. To do so, we have relied on a unique harmonised matched employer-employee data set, the 1995 European Structure of Earnings Survey. As far as we know, this paper is the first to analyse with recent techniques, on a comparable basis, and from a European perspective: i) inter-industry wage differentials by gender, ii) gender wage gaps by industry, and iii) the contribution of industry effects to the overall gender wage gap. It is also one of the few, besides Kahn (1998), to analyse for both sexes the relationship between collective bargaining characteristics and the dispersion of industry wage differentials. Finally, it adds to existing literature by examining, separately for male and female workers, to what extent industry wage differentials are correlated to industry profitability at the Nace two-digit level.

Empirical findings show that, in all countries and for both sexes, wage differentials exist between workers employed in different sectors, even when controlling for working conditions, individual and firm characteristics. We also find that the hierarchy of sectors in terms of wages is quite similar for male and female workers and across countries. Yet, the apparent similarity between male and female industry wage differentials is challenged by standard statistical tests. Indeed, simple t-tests show that between 43 and 71% of the industry wage disparities are significantly different for women and men. Moreover, Chow tests indicate that sectoral wage differentials are significantly different as a group for both sexes in

all countries. Regarding the dispersion of the industry wage differentials, we find that results vary for men and women, although not systematically nor substantially. Yet, the dispersion of industry wage differentials fluctuates considerably across countries. It is quite large in Ireland, Italy and the U.K., and relatively moderate in Belgium, Denmark and Spain. For both sexes, results point to the existence of a negative and significant relationship between the degree of centralisation of collective bargaining and the dispersion of industry wage differentials.

For all countries (except in Ireland) and for both sexes, we also find that industry wage differentials are significantly and positively correlated with industry profitability. The magnitude of this correlation, however, appears to be lower in countries with centralised and coordinated collective bargaining. These findings suggest that: i) inter-industry wage differentials derive at least partially from inter-industry variations in the ability-to-pay, and ii) the sensitivity of industry wage differentials to the sectoral ability-to-pay is larger in decentralised and poorly coordinated wage setting environments.

Furthermore, independently of the country considered, results show that more than 80% of the gender wage gaps within industries are statistically significant. The average industry gender wage gap ranges between -.18 in the U.K. and -.11 in Belgium. This means that on average women have an inter-industry wage differential of between 18 and 11% below that for men. Yet, correlation coefficients between the industry gender wage gaps across countries are relatively small and often statistically insignificant. This finding suggests that industries with the highest and the lowest gender wage gaps vary substantially across Europe.

Finally, results indicate that the overall gender wage gap, measured as the difference between the mean log wages of male and female workers, fluctuates between .18 in Denmark and .39

in the U.K. In all countries a significant (at the .01 level) part of this gap can be explained by the segregation of women in lower paying industries. Yet, the relative contribution of this factor to the gender wage gap varies substantially among European countries. It is close to zero in Belgium and Denmark, between 7 and 8% in Ireland, Spain and the U.K., and around 16% in Italy. Differences in industry wage premia for male and female workers significantly (at the .05 level) affect the gender wage gap in Denmark and Ireland only. In these countries, gender differences in industry wage differentials account for respectively 14 and 20% of the gender wage gap. To sum up, findings show that combined industry effects explain around 29% of the gender wage gap in Ireland, respectively 14 and 16% in Denmark and Italy, around 7% in the U.K. and almost nothing in Belgium and Spain.

In conclusion, our results emphasize that the magnitude of the gender wage gap as well as its causes vary substantially among the European countries. This suggests that no single policy instrument will be sufficient to tackle gender pay inequalities in Europe. Our findings indicate that policies need to be tailored to the very specific context of the labour market in each country.

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Notes

[1] It thus covers the following sectors: i) mining and quarrying (C), ii) manufacturing (D), iii) electricity, gas and water supply (E), vi) construction (F), iv) wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods (G), v) hotels and restaurants (H), vi) transport, storage and communication (I), financial intermediation (J), and vii) real estate, renting and business activities (K).

[2] The number of regional dummies is as follows: Belgium (2), Italy (10), Spain (6), and the U.K. (9). This variable is not available for Denmark and Ireland.

[3] Except for Ireland where the number of sectoral dummies is equal to 33.

[4] For the U.K., it is the size of the firm.

[5] In all countries, Spearman correlation coefficients between male and female industry wage differentials are significant at the .01 level. Their value fluctuates between 71 and 84%.

[6] The degree of centralisation refers strictly to the principal level at which bargaining occurs (establishment, firm, industry or national). In contrast, the degree of coordination among the social partners refers to the ability of trade unions and employers' organisations to coordinate their decisions both horizontally (within a given bargaining level) and vertically (between different bargaining levels). Coordination might be 'overt' or 'covert'. Overt or direct coordination refers to the explicit pursuit of economy-wide coordination goals by the principal bargaining agents (i.e. peak associations of business and labour, possibly joined by the government agencies in tripartite arrangements). In contrast, covert or indirect coordination is achieved through the internal governance of the associations and/or through the pace-setting role of bargaining in key sectors (for a more detailed discussion see, for example, OECD 1997).

[7] Yet, our results should be considered with caution since we do not control for the unobserved individual characteristics of the workers. Indeed, these characteristics might modify our results if it emerged that they were not randomly distributed across sectors, sexes and/or countries. See, for example, Björklund *et al.* (2004) for results which assign an important role for unmeasured ability.

[8] To discriminate between both explanations, one should *inter alia* control for the potential simultaneity problem between wages and profits. For more details see, for example, Abowd and Lemieux (1993), Arai (2003), Blanchflower *et al.* (1996), Christophides and Oswald (1992), Hildreth and Oswald (1997), Nekby (2003), Nickell (1999), or Rycx and Tojerow (2004).

[9] Similar results are found when we consider the *Pearson* correlation coefficient between industry wage differentials and industry profitability rather than the *Spearman* correlation coefficient as it is the case in Table 6.

[10] Horrace and Oaxaca (2001) demonstrated that the gender wage gaps across industries estimated by Fields and Wolff (1995) were not invariant to the choice of the left-out reference groups of the categorical variables in the wage equation.

Table 1: Means of Selected Variables (Standard Deviations)

	Belgium		*Denmark*		*Italy*		*Ireland*		*Spain*		*U.K.*	
Characteristic	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*
Gross Hourly Wage (in ECU)[1]	16.0	12.8	21.1	17.2	9.4	7.2	13.1	8.6	9.9	7.1	10.6	6.9
	(8.5)	(5.4)	(11.5)	(10.3)	(5.1)	(3.2)	(10.4)	(5.6)	(6.9)	(4.3)	(8.3)	(4.2)
Prior Potential Experience[2]	9.8	9.1	13.3	13.4	12.4	10.4	9.0	7.9	13.5	10.7	16.5	17.9
	(8.2)	(8.6)	(10.4)	(10.7)	(9.4)	(9.3)	(8.4)	(8.7)	(9.7)	(9.2)	(11.3)	(11.7)
Seniority in the Establishment	11.0	8.9	6.5	5.5	10.6	8.9	10.7	7.1	11.2	8.4	5.6	4.1
	(9.7)	(8.7)	(8.0)	(7.0)	(9.0)	(8.4)	(9.5)	(7.0)	(10.2)	(8.7)	(5.7)	(4.6)
Number of Paid Hours[3]	168.1	147.5	142.2	133.2	173.5	159.1	195.6	164.1	165.2	158.0	153.2	119.4
	(16.9)	(36.4)	(40.8)	(42.4)	(24.5)	(33.5)	(62.2)	(47.5)	(12.6)	(26.0)	(29.3)	(43.8)
Percent Permanent Contract	97.5	95.0	93.6	93.3	94.9	91.1	93.8	93.7	74.6	68.3	90.4	88.7
Size of the Establishment[4]	777.7	406.3	1,108.1	1,824.6	1,507.2	1,281.1	1,502.7	1,821.5	743.4	672.5	15,945.0	15,275.1
	(1,681.7)	(1,007.2)	(2,974.4)	(4,377.1)	(7,193.8)	(7,224.2)	(2911.2)	(3,084.1)	(2,345.9)	(2,212.9)	(42,445.2)	(33,306.4)
Number of Observations	58,166	22,099	342,457	203,816	69,222	23,610	22,659	13,856	127,475	39,092	49,306	30,257

Descriptive statistics refer to the weighted sample. They have been computed using the 1995 European Structure of Earnings Survey.

[1] Includes overtime paid, premiums for shift work, night work and / or weekend work, and bonuses (i.e. irregular payments which do not occur during each pay period, such as pay for holiday, 13th month, profit sharing, etc.). 1 ECU = 1,23 USD (in 1995).

[2] Experience (potentially) accumulated on the labour market before the last job. It has been computed as follows: age – 6 – years of education – seniority.

[3] Number of hour paid in the reference period (October 1995), including overtime paid.

[4] Number of workers in the establishment (or firm in the U.K.).

***Table 2*: Inter-Industry Wage Differentials by Gender**

	Belgium		*Denmark*		*Italy*		*Ireland*		*Spain*		*U.K.*	
Industry (Nace two-digit)	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*	*Men*	*Women*
Mining of coal and lignite; extraction of peat (10)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-.01***	+.21***	n.a.	n.a.	n.a.	n.a.
Mining of Metal Ores (13)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	+.53***	+1.04***	n.a.	n.a.	n.a.	n.a.
Other extractive industries (14)	0	0	-.03***	-.06***	-.08***	+.02	-.15***	-.19***	+.04***	+.11***	-.04	+.06
Food industries (15)	-.01	0	-.03***	0	+.01	+.06***	-.05***	-.01	+.02***	-.04***	+.02**	+.04***
Tabacco industry (16)	+.04	+.04	+.05***	+.03***	-.08***	+.11***	+.47***	+.30***	+.16***	+.32***	+.32***	+.54***
Textile industry (17)	-.10***	-.14***	-.05***	-.09***	-.07***	-.09***	-.12***	-.15***	-.16***	-.15***	-.09***	-.05***
Cloting and fur industry (18)	-.08***	-.13***	-.10***	-.14***	-.23***	-.15***	-.14***	-.10***	-.12***	-.14***	-.15***	-.09***
Leather and footwear industry (19)	-.07***	-.01	-.17***	-.06**	-.14***	-.12***	-.26***	-.14***	-.12	+.06***	0	-.02
Woodwork and manufacture of articles in wood, cork, basketwork or esparto (20)	-.07***	-.05***	-.03***	-.01*	-.16***	-.06***	-.12***	-.10**	-.16***	-.10***	-.09***	-.02
Paper and cardboard industry (21)	+.08***	-.01	+.04***	-.03***	-.03**	-.04	+.05***	+.09***	0	+.01	+.09***	+.10***
Publishing, printing and reproduction (22)	+.08***	+.02	+.11***	+.08***	+.05***	+.05***	+.21***	+.13***	+.02*	+.04**	+.11***	+.14***
Coking, refining and nuclear industries (23)	+.23***	+.15***	+.12***	+.06**	+.16***	+.15***	+.35***	+.73***	+.32***	+.30***	+.24***	+.24***
Chemical industry (24)	+.09***	+.07***	+.01***	+.04***	+.01	+.11**	+.20***	+.15***	+.11***	+.14***	+.12***	+.13***
Rubber and plastic industry (25)	-.01	+.02	+.01***	+.01**	-.09***	-.04***	-.03***	-.04	-.01*	+.02	-.01	0
Manufacture of other non-metallic mineral products (26)	+.02***	-.02	-.01***	-.01*	-.07***	+.02	+.04***	+.07**	+.01**	+.02	-.01	+.03
Metallurgy (27)	0	+.04**	-.06***	-.02**	0	-.11	+.13***	+.09	+.02*	+.07***	+.05***	+.04
Metal work (28)	-.02***	+.01	-.03***	-.03***	-.08***	-.03	-.05***	+.02	-.01	+.05***	0	+.01
Manufacture of machinery and plant (29)	-.06***	-.07***	-.07***	-.06***	-.06***	+.01	-.04***	-.09***	+.01	+.09***	+.03***	+.05***
Manufacture of office machinery and computers (30)	0	+.10***	+.02	-.02	-.04	-.01	-.06***	+.05*	-.12***	-.10	+.15***	+.13***
Manufacture of electrical machinery and appliances (31)	-.02***	-.04**	-.05***	-.04***	-.10***	-.02	-.02	+.05***	-.04***	+.03**	-.04***	-.01
Manufacture of radio, television and comm. equip. (32)	-.01	-.08***	-.14***	-.11***	-.05***	0	-.02	+.08***	-.03*	+.06***	0	+.02
Manufacture of medical, precision, optical watch making instruments (33)	+.01	-.02	-.02***	+.02***	-.07***	0	+.01	0	-.03	0	-.02	-.02
Manufacture of motor vehicles, trailers and semi-trailers (34)	0	-.02	-.09***	-.07***	-.15***	-.14***	-.23***	-.12***	-.11***	+.02	+.12***	+.12***
Manufacture of other transport materials (35)	-.03***	+.01	+.03***	0	-.14***	-.03	-.15***	-.05	-.02*	+.08***	+.04***	+.09***
Manufacture of furniture; sundry industries (36)	-.10***	-.06***	-.09***	-.02***	-.15***	-.05**	-.05***	+.03	-.12***	-.04***	-.05***	+.02
Recovery of recyclable materials (37)	-.01	-.06***	-.09***	-.08**	-.14***	+.03	+.13	-.14***	-.01	+.09	+.08	+.05
Prod. and distr. of electricity, gas, steam and hot water (40)	+.28***	+.26***	-.01*	0	+.14***	+.19***	+.14***	+.25***	+.17***	+.22***	+.19***	+.25***
Collection, purification and distribution of water (41)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-.23***	+.10*	n.a.	n.a.	n.a.	n.a.
Construction (45)	-.08***	-.08***	+.03***	-.02***	-.03**	-.01	n.a.	n.a.	+.04***	+.05***	-.02***	+.03**
Dealing in and repairing motor vehicles and motorcycles; retail fuel trade (50)	-.04***	-.03**	-.08***	-.06***	-.11***	+.01	-.06***	-.07**	-.04***	-.02	-.12***	-.08***
Wholesale and intermediaries in trade, excl. motor trade (51)	-.02***	+.01***	0	0	-.06***	-.01	+.12***	+.07***	-.03***	-.07***	-.03***	-.01
Retail, excl. motor trade (52)	-.09***	-.10***	-.16***	-.14***	-.08***	-.08***	-.23***	-.13***	-.07***	-.06	-.14***	-.12***
Hotels and restaurants (55)	-.20***	-.15***	-.02**	+.02***	-.12***	+.03*	-.16***	-.14***	-.04***	0	-.25***	-.14***
Land-based transport (60)	-.04***	-.03**	+.03***	-.06***	+.19***	+.11***	n.a.	n.a.	-.02***	+.01***	-.02***	+.02

Water-based transport (61)	+.13***	+.15***	+.04**	-.05***	+.05	+.01	n.a.	n.a.	+.25***	+.20	+.12***	+.08
Air transport (62)	+.13***	+.16***	+.19***	+.20***	+.18***	+.19***	n.a.	n.a.	-.19***	-.09***	+.15***	+.24***
Transport auxiliary services (63)	0	+.03***	+.02***	-.04***	+.06***	+.06***	n.a.	n.a.	+.07***	+.06***	+.05***	0
Post and telecommunications (64)	-.12***	-.02**	+.06***	+.07***	+.06***	+.14***	n.a.	n.a.	+.06***	+.12***	-.09***	+.05***
Financial intermediaries (65)	+.14***	+.13***	+.17***	+.15***	+.40***	+.39***	+.11***	+.12***	+.16***	+.27***	+.32***	+.26***
Insurance (66)	+.06***	+.06***	+.20***	+.11***	+.22***	+.20***	+.31***	+.25***	+.06***	+.12***	+.20***	+.16***
Financial auxiliaries (67)	-.03	-.03**	+.33***	+.24***	+.33***	+.21***	n.a.	n.a.	+.33***	+.32***	+.29***	+.15***
Property activities (70)	-.01	-.01	-.04***	+.01**	+.40***	+.22	n.a.	n.a.	+.12***	+.10	-.01	+.02
Dry hire (71)	-.10***	+.05	+.07***	+.02	-.20	+.09	n.a.	n.a.	-.06**	+.04	-.10***	-.05*
Computer activities (72)	-.01	0	+.11***	+.12***	+.06**	+.04	n.a.	n.a.	-.03	-.02***	+.19***	+.16***
Other services to businesses (74)	-.02***	+.01**	0	-.01***	-.07***	-.04***	n.a.	n.a.	-.04***	-.05***	+.03***	+.05***
Adjusted R^2 of wage regression	.67	.63	.58	.54	.68	.66	.65	.62	.61	.60	.57	.48
F-stat relative to the sectoral dummies	138***	38***	456***	319***	65***	31***	57***	35***	92***	43***	83***	57***
Percent significant industry wage differentials at the .10 level	67%	64%	90%	81%	83%	57%	85%	82%	83%	69%	79%	60%
Spearman correlation coefficient between male and female wage differentials	.74***		.77***		.72***		.71***		.84***		.71***	
Percent industry wage differentials significantly different for male and female workers at the .10 level	43%		71%		55%		68%		55%		52%	
F-stat relative to Chow test on industry dummy variables	93***		604***		50***		46***		131***		109***	
Range of industry wage differentials	.47	.41	.50	.38	.62	.55	.78	1.23	.51	.47	.57	.68
Weighted adjusted standard deviation of industry wage differentials	.08	.08	.08	.09	.13	.12	.14	.12	.08	.10	.12	.12
Number of industries	42	42	42	42	42	42	34	34	42	42	42	42
Number of observations	58,166	22,099	342,457	203,816	69,222	23,610	22,659	13,856	127,475	39,092	49,306	30,257

n.a. stands for not available. Results are based on equation (1) in the text, estimated on the basis of the 1995 European Structure of Earnings Survey. Standard errors of the industry wage differentials have been corrected according to Haisken-DeNew and Schmidt (1997). * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 3: Correlation of Industry Wage Differentials by Gender between Countries

Sex		Denmark	Ireland	Italy	Spain	U.K.
Female						
Belgium	*Pearson*	.44***	.68***	.48***	.47***	.63***
	Spearman	.53***	.70***	.43***	.38***	.61***
Denmark	*Pearson*		.59***	.66***	.41***	.54***
	Spearman		.64***	.64***	0.29	.51***
Ireland	*Pearson*			.57***	.65***	.67***
	Spearman			.55***	.47***	.67***
Italy	*Pearson*				.57***	.47***
	Spearman				.56***	.52***
Spain	*Pearson*					.63***
	Spearman					.53***
Male						
Belgium	*Pearson*	.38***	.65***	.53***	.53***	.73***
	Spearman	.42***	.74***	.53***	.52***	.78***
Denmark	*Pearson*		.67***	.71***	.50***	.64***
	Spearman		.59***	.62***	.47***	.54***
Ireland	*Pearson*			.58***	.75***	.71***
	Spearman			.68***	.73***	.62***
Italy	*Pearson*				.62***	.63***
	Spearman				.64***	.57***
Spain	*Pearson*					.52***
	Spearman					.58***

Estimations are based on the 1995 European Structure of Earnings Survey. * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 4: Dispersion of Industry Wage Differentials by Gender and Collective Bargaining Characteristics

	WASD [a]		*Year*	*Number of sectors*	*Degree of centra-lisation* [b]	*Degree of coordi -nation* [c]	*Union coverage rate* [d]	*Union density* [e]
Country	*Male workers*	*Female workers*						
Belgium	.08	.08	1995	42	10	2	.96	.51
Denmark	.08	.09	1995	42	14	3	.69	.71
Ireland	.14	.12	1995	34	6	1	.66	.50
Italy	.13	.12	1995	42	5	2	.90	.39
Spain	.08	.10	1995	42	7	2	.83	.11
UK	.12	.12	1995	42	6	1	.39	.39
Correlation coefficients between WASD and collective bargaining characteristics:								
a) Male workers								
- Pearson					-.73*	-.71	-.36	-.01
- Spearman					-.83**	-.69	-.40	-.19
b) Female workers								
- Pearson					-.80**	-.68	-.51	-.27
- Spearman					-.89**	-.69	-.58	-.52

[a] Weighted adjusted standard deviation of industry wage differentials. [b] Nickell and Layard (1999). The scale ranges between 1 and 17. A large value is associated to a highly centralised country. [c] Nickell and Layard (1999). Average of union and employer coordination. 1 is low coordination, 2 is intermediate coordination, 3 is high coordination. [d] EIRO (2002) and Traxler *et al.* (2001). [e] Nickell and Layard (1999). Estimations are based on the 1995 European Structure of Earnings Survey. * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 5: Correlation between Industry Wage Differentials by Gender and Industry Profitability

Country		*Number of sectors*	*Wage-profit correlations* [a]	
			Men	*Women*
Belgium	*Pearson*	35	.58***	.66***
	Spearman		.61***	.61***
Denmark	*Pearson*	29	.14	.15
	Spearman		.00	.14
Ireland	*Pearson*	23	.57***	.58***
	Spearman		.67***	.71***
Italy	*Pearson*	34	.59***	.58***
	Spearman		.54***	.44***
Spain	*Pearson*	27	.68***	.58***
	Spearman		.63***	.45**
U.K. [b]	*Pearson*	25	.78***	.93***
	Spearman		.77***	.79***

[a] Industry wage differentials by gender have been estimated with the 1995 European Structure of Earnings Survey. Data on industry profitability are drawn from the 1995 European Structure of Business Survey. The industry profitability has been estimated by the industry level gross operating surplus per employee. [b] Data on profits for the U.K. refer to the year 1996. * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 6: Correlation between Collective Bargaining Characteristics and the (Spearman) Correlation Coefficients between Industry Wage Differentials and Industry Profitability [a]

Sex	*Degree of Centralisation* [b]	*Degree of coordination* [b]	*Union coverage rate* [c]	*Union density* [b]
Men:				
- Pearson	-.84**	-.88**	-.14	-.65
- Spearman	-.41	-.93***	-.60	-.49
Women:				
- Pearson	-.68	-.95***	-.37	-.31
- Spearman	-.35	-.93***	-.49	-.26

[a] Correlation coefficients between industry wage differentials and industry profitability (at the Nace two-digit level) are drawn from Table 5. [b] Nickell and Layard (1999). [c] EIRO (2002) and Traxler *et al.* (2001). Estimations are based on the 1995 European Structure of Earnings Survey and the 1995 European Structure of Business Survey. * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 7: Identified Wage Gaps Evaluated at Women Sample Mean Characteristics

Industry (Nace two-digit)	*Belgium*	*Denmark*	*Ireland*	*Italy*	*Spain*	*U.K.*
Mining of coal and lignite; extraction of peat (10)	n.a.	n.a.	+.05	n.a.	n.a.	n.a.
Mining of Metal Ores (13)	n.a.	n.a.	+.34***	n.a.	n.a.	n.a.
Other extractive industries (14)	-.12***	-.16***	-.21***	-.07	-.13***	-.11*
Food industry (15)	-.10***	-.10***	-.14***	-.12***	-.27***	-.18***
Tobacco industry (16)	-.11***	-.16***	-.34***	+.02	-.04	+.02
Textile industry (17)	-.16***	-.18***	-.20***	-.08**	-.19***	-.17***
Cloting and fur industry (18)	-.16***	-.17***	-.13***	-.19***	-.22***	-.14***
Leather and footwear industry (19)	-.05*	-.02	-.05	-.15***	-.02	-.23***
Woodwork and manufacture of articles in wood, cork, basketwork or esparto (20)	-.10***	-.12***	-.16***	-.08***	-.14***	-.13**
Paper and cardboard industry (21)	-.20***	-.20***	-.14***	-.17***	-.18***	-.19***
Publishing, printing and reproduction (22)	-.18***	-.16***	-.25***	-.16***	-.18***	-.17***
Coking, refining and nuclear industries (23)	-.20***	-.19***	-.21**	-.18***	-.23***	-.20***
Chemical industry (24)	-.13***	-.10***	-.22***	-.07***	-.17***	-.20***
Rubber and plastic industry (25)	-.09***	-.14***	-.18***	-.12***	-.16***	-.19***
Manufacture of other non-metallic mineral products (26)	-.15***	-.14***	-.15***	-.08***	-.20***	-.16***
Metallurgy (27)	-.08***	-.09***	-.21***	-.27***	-.15***	-.21***
Metal work (28)	-.09***	-.14***	-.11***	-.11***	-.14***	-.19***
Manufacture of machinery and plant (29)	-.12**	-.13***	-.22***	-.10***	-.12***	-.18***
Manufacture of office machinery and computers (30)	-.01	-.17***	-.06**	-.13***	-.17**	-.22***
Manufacture of electrical machinery and appliances (31)	-.14***	-.12***	-.11***	-.09***	-.13***	-.17***
Manufacture of radio, television and comm. equip. (32)	-.18***	-.11***	-.07***	-.12***	-.12***	-.18***
Manufacture of medical, precision, optical watch making instruments (33)	-.15***	-.10***	-.18***	-.10***	-.18***	-.20***
Manufacture of motor vehicles, trailers and semi-trailers (34)	-.14***	-.12***	-.06*	-.16***	-.06*	-.20***
Manufacture of other transport materials (35)	-.07***	-.16***	-.07	-.06*	-.10***	-.15***
Manufacture of furniture; sundry industries (36)	-.07***	-.06***	-.09***	-.07***	-.12***	-.13***
Recovery of recyclable materials (37)	-.17***	-.12***	-.44***	0	-.10	-.22
Prod. and distr. of electricity, gas, steam and hot water (40)	-.13***	-.13***	-.06	-.12***	-.14***	-.15***
Collection, purification and distribution of water (41)	n.a.	n.a.	.16**	n.a.	n.a.	n.a.
Construction (45)	-.11***	-.19***	n.a.	-.14***	-.19***	-.15***
Dealing in and repairing motor vehicles and motorcycles; retail fuel trade (50)	-.10***	-.11***	-.19***	-.05	-.18***	-.17***
Wholesale and intermediaries in trade, excl. motor trade (51)	-.08***	-.13***	-.22***	-.12***	-.23***	-.18***
Retail, excl. motor trade (52)	-.11***	-.11***	-.07***	-.16***	-.20***	-.18***
Hotels and restaurants (55)	-.07**	-.09***	-.16***	-.01	-.16***	-.09***
Land-based transport (60)	-.10***	-.22***	n.a.	-.25***	-.17***	-.16***
Water-based transport (61)	-.09*	-.22***	n.a.	-.20***	-.25***	-.24***
Air transport (62)	-.09	-.13***	n.a.	-.16**	-.11	-.11***
Transport auxiliary services (63)	-.10***	-.19***	n.a.	-.17***	-.21***	-.25***
Post and telecommunications (64)	-.02	-.12***	n.a.	-.09***	-.14***	-.06***
Financial intermediaries (65)	-.12***	-.16***	-.17***	-.15***	-.09***	-.27***
Insurance (66)	-.11***	-.22***	-.23***	-.19***	-.14***	-.24***
Financial auxiliaries (67)	-.12***	-.22***	n.a.	-.29***	-.21***	-.35***
Property activities (70)	-.11**	-.08***	n.a.	+.01	-.22***	-.17***
Dry hire (71)	+.03	-.18***	n.a.	+.13	-.10**	-.16***
Computer activities (72)	-.10***	-.13***	n.a.	-.19***	-.18***	-.23***
Other services to businesses (74)	-.09***	-.15***	n.a.	-.14***	-.21***	-.18***
Average wage gap	-.11	-.14	-.12	-.12	-.16	-.18
Range of wage gaps	.24	.20	.78	.42	.25	.37
Standard deviation of wage gaps	.05	.05	.15	.08	.05	.06
Percent significant gender wage gaps	90%	98%	88%	83%	90%	95%
Number of industries	42	42	34	42	42	42

n.a. stands for not available. Estimations are based on the 1995 European Structure of Earnings Survey. * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 8: Correlation of Gender Wage Gaps by Industry between Countries

Country		Denmark	Ireland	Italy	Spain	U.K.
Belgium	*Pearson*	.14	.00	.27*	.20	.15
	Spearman	.14	.10	.13	.16	.14
Denmark	*Pearson*		.01	.31**	.32**	.21
	Spearman		.11	.41***	.26*	.12
Ireland	*Pearson*			-.37**	-.18	-.18
	Spearman			-.24	.03	-.04
Italy	*Pearson*				.30*	.55***
	Spearman				.33**	.55***
Spain	*Pearson*					.27*
	Spearman					.19

Gender wage gaps by industry are drawn from Table 7. Estimations are based on the 1995 European Structure of Earnings Survey. * Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.

Table 9: Decomposition of the Overall Gender Wage Gap

		Percentage of overall wage gap due to difference in:		
	Overall gender wage gap:	*Employment distribution:*	*Industry coefficients:*	*All other factors:*
Country	$\left[\overline{\ln W_i^{\,m}} - \overline{\ln W_i^{\,f}}\right]$	$\sum_{k=1}^{K} \overline{\hat{\psi}}_k \left(s_k^m - s_k^f\right)$	$\sum_{k=1}^{K} \overline{s}_k \left(\hat{\psi}_k^m - \hat{\psi}_k^f\right)$	
Belgium	.20	3.1***	-.3.8	100.8
Denmark	.18	-1.5***	14.1***	87.4
Ireland	.35	8.5***	20.1***	71.4
Italy	.24	15.8***	-13.6	97.8
Spain	.30	8.1***	-7.8*	99.7
U.K.	.39	7.2***	-0.4	93.2

The level of significance of the different components of the gender wage gaps has been computed according to Oaxaca and Ransom (1998). Estimations are based on the 1995 European Structure of Earnings Survey.
* Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level.