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*WP 2008.05*

ETUI-REHS RESEARCH DEPARTMENT

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European Trade Union Institute
for Research, Education and Health and Safety (ETUI-REHS)

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Brussels, 2008

Print: ETUI-REHS Printshop, Brussels

D/2008/10.574/17

ISSN 1994-4446 (print version)

ISSN 1994-4454 (pdf version)

The ETUI-REHS is financially supported by the European Community. The European Community is not responsible for any use made of the information contained in this publication.

# Contents

## Non-technical summary

In this paper, we examine wage differentials across sectors in Eastern and Western European countries (that is, Belgium, Czech Republic, Italy, Latvia, Lithuania, Netherlands, Norway, Portugal, Slovakia and Spain). To do so, we use harmonised data from the 2002 European Structure of Earnings Survey. This survey contains detailed information on worker, job and establishment characteristics (for example, gross hourly wages, bonuses, age, education, tenure, sex, occupation, employment contract, working time, industry, size of establishment, level of wage bargaining, region where the establishment is located). Although the effect of sectoral affiliation on workers' wages has been a topic of great interest, the evidence for Eastern European countries is scarce (Chase, 1998; Newell, 2001; Geishecker and Haisken-DeNew, 2002). Moreover, a detailed comparison of inter-industry wage differentials (that is, wage differentials across sectors) in Eastern and Western European countries has yet to be performed.

Our findings for all countries show large wage differentials between workers employed in different sectors. For instance, we find that the average worker in the coking, refining and nuclear industry earns between 46.3% (in Italy) and 365.8% (in Lithuania) more than the average worker in the economy. In contrast, workers in the clothing and fur industry earn between almost 20% (in the Netherlands) and 60% (in the Czech Republic) less than the average worker in the economy. In the hotels and restaurants sector, these percentages vary between –27.8% in Italy and –49.3% in Lithuania.

Obviously, the size of these inter-industry wage differentials is substantially reduced when controlling for composition effects, that is, for the fact that worker, job and establishment characteristics vary across sectors. However, earnings differences across sectors, stripped of composition effects, remain significant and quite substantial in all countries. Moreover, we note that high- and low-wage industries are fairly similar in Eastern and Western European countries. Among the best paying industries, we find the energy (namely coke, petroleum, gas, electricity and nuclear power), chemical, financial and computer industries. The average worker in the coking, refining and nuclear industry, for instance, earns between 15.5% (in Norway) and 118.6% (in Lithuania) more than the average worker in the economy, when controlling for composition effects. In contrast, it is in the traditional sectors (wood and cork industry, textile, clothing and leather industry, hotels and restaurants, and retailing) that wages are lowest. The wage penalty in the hotels and restaurants sector, for example, is now estimated at 13.7% in Italy and 10.8% in Lithuania, ceteris paribus.

Further results show that the dispersion of inter-industry wage differentials (after controlling for composition effects) fluctuates considerably across countries. In line with the literature, we find that the variability of wages between sectors is relatively small in Norway and Belgium and fairly high in Italy, Spain and (in particular) Portugal. Results for Eastern European countries are remarkable; they show that the dispersion of wages across sectors in the Czech Republic is of the same order of magnitude as in Southern European countries, that is, comparable to figures recorded for the Anglo-Saxon countries. As regards Latvia, Lithuania and Slovakia, we find that the dispersion of industry wage premia is well above those reported for Western European countries and even for the Anglo-American world. To understand these differences across countries, we examined the correlation between the dispersion of inter-industry wage differentials

and collective bargaining characteristics. Results suggest that wage differentials between sectors are significantly bigger in countries where wage bargaining is weakly coordinated and essentially organised at the firm or establishment level. Moreover, findings indicate that the structure of wages across sectors is less compressed when the proportion of workers covered by a collective agreement is relatively small. Our results thus support the hypothesis that the dispersion of wages between industries depends negatively on a country's degree of corporatism.

## Abstract

This study compares the structure and determinants of inter-industry wage differentials in Eastern and Western European countries (namely Belgium, Italy, the Netherlands, Norway, Portugal and Spain compared with Latvia, Lithuania, the Czech Republic and Slovakia). To do so, we use a unique harmonised, linked employer–employee data set, the 2002 European Structure of Earnings Survey. Findings show substantial differences in earnings across sectors in all countries, even when controlling for a wide range of employee, job and employer characteristics. The hierarchy of sectors in terms of wages appears to be quite similar in Eastern and Western European countries. Among high-wage sectors, we find the energy (coke, petroleum, gas, electricity and nuclear power), chemical, financial and computer industries. In contrast, it is in the traditional sectors (wood and cork industry, textile, clothing and leather industry, hotels and restaurants, and retailing) that wages are lowest. Further results suggest that the dispersion of inter-industry wage differentials fluctuates considerably across countries. It is relatively small in Norway and Belgium, large in the Netherlands, Italy, Spain and the Czech Republic, and very large in Portugal, Latvia, Lithuania and Slovakia. Our findings support the hypothesis of a negative relationship between the dispersion of inter-industry wage differentials and a country's degree of corporatism.

## 1. Introduction

The empirical debate about the causes of earnings inequalities was reopened at the end of the 1980s by an article by Krueger and Summers (1988). The authors highlighted the fact that the structure of wages in the US was not compatible with the neo-classical model, according to which wage differentials in equilibrium are explained either through differences in the quality of the labour force – measured in terms of productive capacity – or by so-called compensating differences. In other words, they showed that wage disparities persisted between agents with apparently identical individual characteristics and working conditions, employed in different sectors. Since then, similar results have been obtained for numerous industrialised countries (Lucifora, 1993; Ferro-Luzzi, 1994; Vainiomäki *et al.*, 1995; Araï *et al.*, 1996; Hartog *et al.*, 1997, 1999; Plasman *et al.*, 2006; Gannon *et al.*, 2007). Accordingly, the existence of sectoral effects has become a stylised fact in the economic literature. There is, moreover, general agreement on the fact that these effects are persistent (Gittleman *et al.*, 1993; Kouwenberg *et al.*, 1999) closely correlated from one country to another (Helwege, 1992; Lucifora, 1993; Erdil *et al.*, 2001), and of varying dimensions in the industrialised countries (Hartog *et al.*, 1997). A number of studies, except that of Björklund *et al.* (2007), suggest in addition that sectoral effects are significantly weaker in strongly corporatist countries, regardless of the period studied (Edin and Zetterberg, 1992; Zweimüller and Barth, 1994; Kahn, 1998; Teulings and Hartog, 1998; Hartog *et al.*, 2000; Gannon *et al.*, 2007).[1] Teulings and Hartog (1998), for example, report that from

[1] The concept of corporatism, borrowed from political science, resembles the level of centralisation of collective bargaining, as well as the degree of coordination between the social partners. However, as this concept has not been defined in one single way, there are differences of opinion as to the relative position of the industrialised countries on the scale of corporatism (OECD, 1997, 2004). The Scandinavian countries and Austria are nevertheless always in the category of strongly corporatist countries, whereas the US and Canada are invariably at the bottom of the ranking. At the present time, Eastern European countries are ranked low on the corporatism scale.

the most to the least corporatist country the dispersion in industry wage premia increases roughly at a ratio of 1:4. 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.

Overall, the existence of sectoral wage premia increasingly cast doubt on the assumption of a perfectly competitive labour market. Indeed, they suggest that individual wages are not solely determined by personal productive characteristics and task descriptions but also by the features of the employers in each sector. Nevertheless, many uncertainties remain. One of these derives from the fact that the unobserved quality of the labour force might not be randomly distributed among industries. In other words, high-paying industries might simply be those in which the unmeasured labour quality is the highest. Using the 1984 and 1986 Displaced Workers Surveys, Gibbons and Katz (1992) show for the US that the magnitude of the industry wage differentials is almost undiminished when estimating wage equations in first differences rather than in levels. Their findings thus indicate that the workers' sectoral affiliation does matter. The unobserved quality explanation has also been tested by Martins (2004). Applying quantile regressions to a Portuguese matched employer–employee data set from 1995, the author rejects the hypothesis that high-wage industries draw disproportionately more on high-ability workers. Therefore, he suggests that non-competitive forces may play an important role in the wage determination process. In contrast, findings of Goux and Maurin (1999) and Abowd *et al.* (1999) show that individual fixed effects explain a large fraction of the estimated inter-industry wage differentials in France. A similar result has been found by Benito (2000) using individual-level data from the British Household Panel Survey for 1991 and 1994, respectively. All in all, there is no consensus regarding the exact scale of the industry wage premia. Moreover, while various explanations based on efficiency wage mechanisms or rent sharing have been put forward (Krueger and Summers, 1988; Thaler, 1989; Lindbeck and Snower, 1990; Walsh, 1999; Benito, 2000; Plasman *et al.*, 2006), the existence of industry wage differentials remains a complex and unresolved puzzle.

In this paper, we compare the structure and determinants of inter-industry wage differentials in Eastern and Western European countries (Belgium, Italy, the Netherlands, Norway, Portugal and Spain compared with Latvia, Lithuania, the Czech Republic and Slovakia). To do so, we use a unique harmonised, linked employer–employee data set, the 2002 European Structure of Earnings Survey (ESES). While matched employer–employee data sets are now available for a number of individual countries, to the best of our knowledge the ESES provides the only multi-country data set with matched employer–employee data. This survey contains detailed information, provided by the management of establishments, both on individual workers (for example, gross hourly wages, bonuses, age, education, tenure, sex, occupation, employment contract, working time) and employers' characteristics (for example, sector of activity, size of establishment, level of wage bargaining, region). Although the effect of sectoral affiliation on workers' wages has been a topic of great interest, the evidence for Eastern European countries is quite limited (Chase, 1998; Newell, 2001; Geishecker and Haisken-DeNew, 2002). Moreover, little is known on how inter-industry wage differentials differ between Eastern and Western European countries. This paper aims to fill this gap by exploring the following questions:

(1) How big and significant are inter-industry wage differentials in Eastern European countries, namely the Czech Republic, Latvia, Lithuania and Slovakia? Can they be explained by the sectoral diversity in employee, job and employer characteristics?

(2) Are the sectors offering high and low wages similar in Eastern and Western European countries?

(3) Does the dispersion of inter-industry wage differentials vary across European countries? Is it significantly different in Eastern European countries? Is it correlated with national collective bargaining characteristics?

The remainder of this paper is organised as follows. Section 2 describes the data used in the paper and presents summary statistics. Sections 3 to 5 present the methodology and the empirical results. The last section concludes.

## 2. Description of the data

The present study is based on the 2002 European Structure of Earnings Survey, gathered by Eurostat. This harmonised survey contains a wealth of information, provided by the management of establishments, both on the characteristics of the latter (for example, sector of activity, number of workers, level of collective wage bargaining, region) and on the individuals working there (for example, age, 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.[2]

Table 1 depicts the means of selected variables across European countries, namely for the Czech Republic, Latvia, Lithuania, Slovakia, Belgium, Italy, the Netherlands, Norway, Portugal and Spain. Gross hourly wages (including bonuses) are found to be much higher in Western European countries (21.5 euros in Norway vs 1.5 euros in Latvia and Lithuania). In contrast, workers appear to have a higher level of education in Eastern Europe. Indeed, while the percentage of individuals having at most a primary degree or no degree varies in Western Europe from 4.9% in Norway to 56.8% in Portugal, this percentage falls to less than 1% in Eastern Europe. In all countries, the vast majority of workers are employed on a full-time basis with a permanent contract. But the incidence of part-time employment reaches more than 20% in the Netherlands and Norway, and more than 10% in Latvia, Lithuania, Belgium and Italy. The proportion of workers with a fixed-term contract stands at more than 20% in Spain and Portugal, and at more than 10% in the Netherlands, the Czech Republic and Lithuania. Also noteworthy is that collective bargaining institutions differ significantly in the West and East of Europe. While the majority of workers in Western Europe have their wages solely determined by national and/or sectoral collective agreements (the percentage varies from 68.9% in Belgium to 93.1% in Italy),[3] the most widespread level of collective bargaining in Eastern Europe is the establishment level. Moreover, many Eastern European workers

[2] 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).

[3] This variable is missing for Norway and the Netherlands.

are not covered by collective agreements (this percentage varies from 34.9% in the Czech Republic to 81.1% in Latvia and Lithuania).

**Table 1: Means of selected variables (weighted sample)**

| Variables | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| Gross hourly wage | 3.0 € | 1.5 € | 1.5 € | 2.4 € | 17.1 € | 11.0 € | 16.3 € | 21.5 € | 5.8 € | 8.6 € |
| **Employee characteristics** | | | | | | | | | | |
| Female | 40.1% | 44.1% | 42.8% | 39.9% | 28.7% | 33.3% | 32.6% | 34.0% | 40.1% | 32.4% |
| Age | 40.5 | 39.4 | 38.7 | 38.6 | 38.2 | 38.5 | 37.4 | 38.8 | 36.8 | 36.9 |
| Primary or no degree | 0.3% | 0.3% | 0.7% | 0.0% | 8.1% | 7.4% | 9.3% | 4.9% | 56.8% | 28.7% |
| Lower secondary | 11.4% | 10.1% | 7.2% | 8.1% | 26.5% | 43.2% | 23.2% | 11.5% | 18.0% | 30.6% |
| General upper secondary | 74.2% | 32.6% | 41.2% | 74.0% | 37.7% | 37.6% | 43.5% | 61.6% | 16.9% | 17.3% |
| Higher non-university short type | 3.4% | 38.3% | 31.4% | 3.9% | 16.0% | 3.9% | 7.2% | 6.6% | 2.2% | 9.0% |
| University and non-university higher education | 10.4% | 18.5% | 19.5% | 13.9% | 10.8% | 7.3% | 16.5% | 14.9% | 6.0% | 14.3% |
| Post-graduate | 0.3% | 0.2% | 0.1% | 0.3% | 0.8% | 0.5% | 0.3% | 0.3% | 0.0% | 0.1% |
| Prior potential experience | 14.6 | 16.6 | 14.8 | 12.2 | 10.7 | 10.5 | 12.5 | 14.6 | 15.3 | 14.0 |
| Seniority in the current company | 8.1 | 3.7 | 4.9 | 8.3 | 10.0 | 11.4 | 7.4 | 6.2 | 7.1 | 7.0 |
| **Job characteristics** | | | | | | | | | | |
| Unlimited-term employment contract | 84.3% | 92.9% | 89.5% | 85.2% | 95.3% | 94.9% | 87.5% | 98.4% | 71.9% | 72.9% |
| Limited-term employment contract | 12.0% | 7.1% | 10.5% | 9.6% | 4.1% | 3.5% | 12.5% | 1.1% | 21.4% | 26.8% |
| Apprentice/trainee contract | 0.0% | 0.0% | 0.0% | 0.0% | 0.1% | 1.2% | 0.0% | 0.5% | 0.0% | 0.3% |
| Other | 3.7% | 0.0% | 0.0% | 5.2% | 0.5% | 0.3% | 0.0% | 0.0% | 6.6% | 0.0% |
| Full-time | 93.3% | 87.5% | 88.1% | 97.3% | 87.1% | 87.1% | 70.4% | 79.2% | 96.4% | 90.0% |
| Part-time | 6.7% | 12.5% | 11.9% | 2.7% | 12.9% | 12.9% | 29.6% | 20.8% | 3.6% | 10.0% |
| Earnings related to overtime | 46.5% | 2.3% | 3.0% | 21.9% | 2.3% | 36.6% | 12.7% | 41.2% | 7.4% | 6.9% |
| Earnings related to shift work | 56.1% | 2.9% | 18.3% | 24.7% | 19.8% | 13.1% | 5.8% | 35.6% | 0.0% | 14.6% |
| **Employer characteristics** | | | | | | | | | | |
| Size of the establishment: | | | | | | | | | | |
| 10–49 workers | 21.3% | 39.7% | 30.6% | 22.8% | 9.3% | 36.5% | 28.0% | 37.5% | 43.8% | 38.5% |
| 50–249 workers | 36.5% | 33.6% | 34.9% | 25.2% | 31.1% | 25.3% | 25.1% | 27.0% | 29.1% | 24.3% |
| 250–499 workers | 11.1% | 9.6% | 9.7% | 9.9% | 19.5% | 8.6% | 9.1% | 10.8% | 8.9% | 8.4% |
| 500–999 workers | 13.4% | 7.0% | 9.6% | 12.7% | 16.1% | 7.4% | 6.9% | 9.2% | 6.1% | 6.5% |
| > 1000 workers | 17.7% | 10.1% | 15.2% | 29.4% | 24.0% | 22.1% | 30.9% | 15.5% | 12.1% | 22.3% |
| **Level of wage bargaining:** | | | | | | | | | | |
| National and/or sectoral level | 12.1% | 0.4% | 0.0% | 7.7% | 68.9% | 93.1% | | | 74.6% | 81.6% |
| Company level | 53.0% | 18.5% | 18.9% | 45.3% | 30.7% | 0.0% | | | 3.4% | 16.5% |
| Other | 0.0% | 0.0% | 0.0% | 4.5% | 0.0% | 0.0% | | | 19.2% | 1.8% |
| No bargaining | 34.9% | 81.1% | 81.1% | 42.5% | 0.4% | 6.9% | | | 2.7% | 0.0% |
| **Number of observations** | 598.493 | 142.045 | 71.608 | 252.601 | 98.023 | 75.179 | 31.873 | 477.662 | 52.725 | 172.437 |

## 3. Methodology

The methodology that has been adopted to estimate the magnitude and dispersion of inter-industry wage differentials is consistent with that of Krueger and Summers (1988). However, the standard errors of the industry wage differentials have been corrected according to Zanchi (1998). Overall, this strategy rests upon the estimation, for each country, of the following Mincer-type (1974) wage equation:

$$\ln w_i = \alpha + \sum_{j=1}^{J} \beta_j X_{j,i} + \sum_{k=1}^{K} \gamma_k Y_{k,i} + \sum_{l=1}^{L} \delta_l Z_{l,i} + \sum_{m=1}^{M} \psi_m S_{m,i} + \varepsilon_i \qquad \textbf{(1)}$$

where $w_i$ represents the gross hourly wage of the individual $i$ (for $i$ = 1, ..., N); $X$ is the vector of the individual characteristics of the workers (6 dummy variables showing the highest completed level of education; prior potential experience, its square and its cube; seniority within the current company and its square; and a dummy for gender); $Y$ is a vector of job characteristics (3 dummies for the type of contract; a dummy for part-time work; an indicator showing whether the individual is paid a bonus for shift work, night-time and/or weekend work; a dummy for extra paid hours; and 23 occupational dummies); $Z$ contains employer characteristics (4 dummies indicating the size of the establishment; between 2 and 3 dummies for the level of wage bargaining; and between 2 and 6 dummies indicating the region where the establishment is located); $S$ comprises dummy variables relating to the sectoral affiliation of the individuals (at the NACE two-digit level); $\alpha$ is the intercept; $\beta$, $\gamma$, $\delta$ and $\psi$ are the parameters to be estimated and $\varepsilon_i$ is an error term.

In accordance with Zanchi (1998), the variability in industry wage differentials has been measured by the standard deviation of the industry wage premia, adjusted for least squares sampling error and weighted by sectoral employment shares. This summary statistic, further referred to in the text as WASD (weighted adjusted standard deviation), corresponds to the following expression:

$$WASD\,(d_m) = \sqrt{\sum_{m=1}^{M+1} \overline{p}_m \left[ d_m - \frac{\sum_{m=1}^{M+1} d_m}{M+1} \right]^2 - \frac{\sum_{m=1}^{M+1} \mathrm{var}(d_m)}{M+1} + \frac{\sum_{m=1}^{M+1} \sum_{l=1}^{M+1} \mathrm{cov}(d_m, d_l^*)}{(M+1)^2}} \qquad \textbf{(2)}$$

## 4. Wage regressions

Before embarking upon the analysis of the effects of workers' sectoral affiliation on wages, we briefly discuss the results from equation (1) that has been estimated for each country by OLS with White (1980) heteroscedasticity-consistent standard errors.

Results from our wage regressions, presented in Table 2, are quite satisfactory. Indeed, a substantial part of the total variation in individual hourly wages is explained by the regression model (the adjusted $R^2$ varies between approximately 40% in Latvia and 64% in Belgium). Moreover, most regression coefficients are significant and have the expected sign. In line with human capital theory, we find that the level of education exercises a substantial positive influence upon wages in all countries. However, the

magnitude of the return on education is quite variable. Notice, for example, that the wage differential between someone with a primary education qualification and someone with a postgraduate degree varies from 39.1% in Norway to 99.4% in the Czech Republic.[4] Overall, the return on education does not appear to be significantly different in Eastern and Western European countries.

**Table 2: Wage regressions (OLS with robust standard errors)**

| Variables | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| Intercept | 0.13** | –0.51** | –0.64** | –0.09** | 2.24** | 1.93** | 1.75** | 2.56** | 0.82** | 1.36** |
| **Employee characteristics** | | | | | | | | | | |
| ***Gender:*** | | | | | | | | | | |
| Male | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref |
| Female | –0.27** | –0.12** | –0.13** | –0.21** | –0.12** | –0.15** | –0.12** | –0.08** | –0.08** | –0.18** |
| ***Education:*** | | | | | | | | | | |
| Primary or no degree | Ref | Ref | Ref | | Ref | Ref | Ref | Ref | Ref | Ref |
| Lower secondary | 0.04 | –0.04 | 0.01 | Ref | 0.04** | 0.06** | 0.05** | 0.00 | 0.13** | 0.04** |
| General upper secondary | 0.21** | 0.02 | 0.04 | 0.15** | 0.12** | 0.20** | 0.24** | 0.07** | 0.25** | 0.15** |
| Higher non-university short type | 0.23** | 0.06* | 0.12** | 0.24** | 0.21** | 0.20** | 0.44** | 0.16** | 0.45** | 0.20** |
| University & non-university higher education | 0.64** | 0.29** | 0.34** | 0.48** | 0.37** | 0.37** | 0.63** | 0.23** | 0.59** | 0.32** |
| Post-graduate | 0.69** | 0.58** | 0.63** | 0.53** | 0.52** | 0.44** | 0.74** | 0.33** | | 0.57** |
| ***Seniority in the current company:*** | | | | | | | | | | |
| Simple | 0.06** | 0.11** | 0.08** | 0.06** | 0.02** | 0.03** | 0.07** | 0.02** | 0.05** | 0.05** |
| Squared | –0.00** | –0.00** | –0.00** | –0.00** | –0.00** | –0.00** | –0.00** | –0.00** | –0.00** | –0.00** |
| Prior potential experience: | | | | | | | | | | |
| Simple | 0.01** | 0.00° | 0.02** | 0.02** | 0.02** | 0.01** | 0.03** | 0.02** | 0.02** | 0.02** |
| Squared | –0.00** | –0.00° | –0.00** | –0.00** | –0.00** | 0.00 | –0.00** | –0.00** | –0.00** | –0.00** |
| Cubed | 0.00 | 0.00 | 0.00** | 0.00** | 0.00** | –0.00° | –0.00** | 0.00** | 0.00** | 0.00** |
| **Job characteristics** | | | | | | | | | | |
| ***Type of contract:*** | | | | | | | | | | |
| Unlimited-term employment contract | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref |
| Limited-term employment contract | –0.23** | –0.07** | –0.28** | –0.17** | –0.11** | –0.32** | –0.31** | –0.06** | –0.20** | –0.30** |
| Apprentice/trainee contract | | –0.85** | | –0.22 | –0.89** | –0.29** | | –0.26** | | –0.51** |
| Other | 0.06** | | | –0.14** | –0.04** | –0.05° | | | –0.08** | |
| ***Working time:*** | | | | | | | | | | |
| Full-time | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref |
| Part-time | –0.07** | –0.14** | –0.27** | –0.26** | –0.04** | 0.04** | –0.04 | –0.07** | 0.03** | –0.04** |
| Dummy for overtime | 0.05** | 0.22** | 0.10** | 0.03** | 0.01** | –0.03** | –0.04 | 0.00* | 0.07** | –0.02** |
| Dummy for atypical working hours (shift work, night work and/or weekend work) | 0.07** | 0.22** | 0.14** | 0.14** | 0.04** | 0.03** | 0.08** | 0.05** | | 0.07** |
| Occupations (ISCO two digits) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

[4] Technically, this figure is obtained by taking the antilog (to base e) of the estimated dummy coefficient from which 1 is subtracted (x 100). For more details see Gujarati (1995: 525).

| **Variables** | **CZ** | **LV** | **LT** | **SL** | **BE** | **IT** | **NL** | **NO** | **PT** | **ES** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Employer characteristics** | | | | | | | | | | |
| ***Size of the establishment:*** | | | | | | | | | | |
| 10–49 workers | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref | Ref |
| 50–249 workers | 0.04** | 0.26** | 0.22** | 0.09** | 0.05** | 0.08** | 0.07* | 0.03** | 0.11** | 0.10** |
| 250–499 workers | 0.06** | 0.49** | 0.41** | 0.14** | 0.08** | 0.13** | 0.06* | 0.04** | 0.21** | 0.16** |
| 500–999 workers | 0.09** | 0.43** | 0.47** | 0.22** | 0.09** | 0.13** | 0.03 | 0.03** | 0.17** | 0.18** |
| > 1000 workers | 0.13** | 0.63** | 0.52** | 0.30** | 0.12** | 0.01** | 0.00 | 0.05** | 0.19** | 0.17** |
| Level of wage bargaining: | | | | | | | | | | |
| National and/or sectoral level | Ref | Ref | | Ref | Ref | Ref | | | Ref | Ref |
| Company level | –0.01 | –0.16** | Ref | –0.06** | 0.06** | | | | 0.17** | 0.05** |
| Other | | | | –0.13** | 0.05** | | | | –0.01 | –0.04** |
| No bargaining | 0.05** | –0.21** | 0.08** | 0.01 | | –0.09** | | | 0.13** | |
| Region where the establishment is located (NUTS one digit): | | | | | | | | | | |
| 1 | | | | | Ref | Ref | –0.06 | | Ref | –0.11** |
| 2 | | | | | 0.03** | –0.03** | 0.01 | | –0.05** | 0.01* |
| 3 | | | | | –0.02** | –0.05** | Ref | | 0.07** | Ref |
| 4 | | | | | | –0.13** | 0.02 | | | –0.13** |
| 5 | | | | | | –0.15** | | | | –0.02** |
| 6 | | | | | | | | | | –0.08** |
| 7 | | | | | | | | | | –0.12** |
| Industries (NACE two digits) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 42.80 | 41.12 | 40.39 | 44.15 | 63.72 | 53.24 | 47.94 | 59.84 | 54.84 | 59.91 |
| Number observations | 584.968 | 142.045 | 71.608 | 252.601 | 98.023 | 75.179 | 31.873 | 475.999 | 52.725 | 170.918 |

**/*/°: Coefficient significant at the 1, 5 and 10 per cent level, respectively.

In all countries (except Italy) we also observe a concave relationship between the gross hourly wage and the general potential experience of a worker on the labour market. Initially, the return on an additional year of experience stands at between (slightly more than) 0 and 3%, depending on the country under investigation. However, it decreases progressively and becomes negative after between 11 years of experience in Latvia and 29 years of experience in Norway. The hypothesis of a bell-shaped relationship between wages and experience rests upon the idea that the investment in human capital (specific training and accumulation by work) diminishes over time and that the stock of human capital suffers from some degree of obsolescence. The growing share of the relationship between wages and experience is explained essentially by the evolution of individual productivity and partly by scale increases.

The relationship between wages and seniority in the company is also in the form of a bell. However, the return on seniority is significantly higher and decreases markedly less quickly than that on experience. Initially, the return on an additional year of experience stands at between 2% (in Norway and Belgium) and 11% (in Latvia). Moreover, the return on an additional year of seniority becomes negative only after around 20 years of seniority in Latvia and 30 years of seniority in Norway. This difference (with respect to the return on general experience) can be explained through the almost automatic

increase in wages as a function of years of seniority (in several European countries) and through the progression in the earnings classification (that is, promotion by seniority). It also illustrates the fact that companies offer more rewards for the human capital specific to their working environment. Finally, these results support the 'turnover' version of the efficiency wage theory (Stiglitz, 1974), according to which companies grant a bonus to workers who are faithful to them.

The dummy variables related to gender suggest that, all other things being equal, women are paid wages that are significantly lower than those of men in all countries. The gender wage gap fluctuates between 7.7% in Portugal and 23.7% in the Czech Republic. However, we cannot conclude that gender wage gaps are systematically bigger in Eastern European countries. Indeed, although Slovakia records the second largest gender wage gap (18.9%), Latvia and Lithuania occupy an intermediate position among European countries. The gender wage penalty in these countries (around 12%) is smaller than that in Italy and Spain, but bigger than in Portugal and Norway.

Regarding job characteristics, we observe a wage penalty against workers with a fixed-term employment contract in all countries. This wage penalty varies between 5.8% in Norway and 27.4% in Italy. It is quite high in Lithuania and the Czech Republic (respectively 24.4% and 20.5%), intermediate in Slovakia (15.6%) and relatively small in Latvia (6.8%). The existence of a wage penalty against workers with a fixed-term employment contract is compatible with the proposal put forward by Harris and Holmström (1982). According to this proposal, employers levy an amount on the wages of newcomers in order to pay for their uncertainty as to their productive ability. However, the reason why this wage penalty differs so much across European countries remains unclear. Table 2 reveals, in addition, the existence of a part-time wage gap in all countries (except Italy, the Netherlands and Portugal). This gap is systematically bigger in Eastern than in Western European countries. Indeed, it fluctuates between –6.8% and –23.7% in the former countries and between –6.8% and +4.1% in the latter.

As regards employer characteristics, we observe that establishment size exercises a positive influence upon wages in all countries, but on a variable scale. Results show, for instance, that the wage differential between an establishment with between 10 and 49 workers and an establishment with between 250 and 499 workers varies from 6.2% in the Czech Republic to 63.2% in Latvia. We also find a large establishment-size wage premium in Lithuania, while it appears to be more moderate in Slovakia. Finally, results for Western European countries (except Italy) indicate that workers covered by a company collective agreement earn between 5.1% (in Spain) and 18.5% (in Portugal) more than those whose wages are solely covered by a national and/or sectoral collective agreement. Results for Eastern European countries, although not directly comparable, go generally in the opposite direction.

## 5. Inter-industry wage differentials

Table 3 reports *gross* inter-industry wage differentials. These wage differentials have been obtained on the basis of a wage equation, using as dependent variable the (log of) individual gross hourly wages including annual bonuses and as independent variable *only* sectoral dummies (at the NACE two-digit level).

**Table 3: Gross inter-industry wage differentials**
(i.e. estimated without control variables), in log points

| | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 Mining of coal and lignite, extraction of peat | 0.449** | 0.218** | 0.141** | 0.333** | -0.272** | -0.103** | | 0.190** | | 0.595** |
| 11 Extraction of crude petroleum and natural gas | 0.328** | | 1.293** | 0.576** | | 0.477** | 0.792** | 0.546** | | 0.835** |
| 12 Mining of uranium and thorium ores | | | | | | | | | 0.429** | |
| 13 Mining of metal ores | | | | -0.560** | | | | 0.111** | 0.002 | 0.176 |
| 14 Other mining and quarrying | 0.347** | 0.450** | 0.205** | 0.102° | -0.083** | -0.027 | 0.494** | 0.059** | 0.034 | 0.047** |
| 15 Food products and beverages | -0.112** | | 0.012 | -0.198** | | 0.021* | 0.183** | -0.098** | -0.052** | -0.048** |
| 16 Tobacco products | 0.941** | | 1.551** | 0.393** | -0.050* | 0.441° | 0.452** | -0.006 | -0.05 | 0.658** |
| 17 Textiles | -0.216** | 0.217** | 0.089** | -0.366** | -0.268** | -0.075** | 0.117** | -0.151** | -0.181** | -0.117** |
| 18 Clothing | -0.505** | -0.143** | -0.128** | -0.333** | -0.183** | -0.336** | -0.092 | -0.228** | -0.385** | -0.387** |
| 19 Leather | -0.444** | -0.437** | -0.02 | -0.377** | -0.172** | -0.262** | -0.033 | -0.145** | -0.333** | -0.368** |
| 20 Wood and cork | -0.067** | -0.147** | -0.273** | -0.214** | -0.248** | -0.215** | 0.101 | -0.122** | -0.104** | -0.189** |
| 21 Paper | 0.090* | 0.100** | 0.418** | 0.308** | 0.003 | 0.054** | 0.234** | 0.012** | 0.265** | 0.244** |
| 22 Printing and publishing | 0.007 | | 0.099** | 0.021 | 0.067** | 0.156** | 0.265** | 0.119** | 0.283** | 0.247** |
| 23 Coke, refined petroleum products and nuclear fuel | 0.431** | | 1.401** | 0.595** | 0.338** | 0.374** | 0.755** | 0.458** | | 0.950** |
| 24 Chemical and chemical products | 0.169** | 0.298** | 0.501** | 0.131** | 0.201** | 0.277** | 0.438** | 0.200** | 0.481** | 0.461** |
| 25 Rubber and plastic products | 0.070** | -0.116** | 0.015 | 0.207** | -0.047** | -0.035** | 0.132° | -0.057** | -0.013 | 0.183** |
| 26 Other non-metallic mineral products | 0.100** | 0.191** | 0.196** | -0.028° | -0.025** | 0.000 | 0.229** | -0.005 | 0.109** | 0.128** |
| 27 Basic metals | 0.123** | 0.538** | 0.350** | 0.455** | 0.053** | 0.053** | 0.352** | 0.106** | 0.164** | 0.434** |
| 28 Fabricated metal products | 0.002 | 0.027* | -0.073** | -0.091** | -0.109** | -0.054** | 0.026 | -0.025** | -0.018 | 0.062** |
| 29 Machinery and equipment | 0.045** | 0.142** | 0.266** | -0.040** | 0.020* | 0.051** | 0.293** | 0.056** | 0.143** | 0.212** |
| 30 Office machinery and computers | -0.119** | 0.462** | -0.290** | -0.082* | -0.104** | 0.036 | 0.286** | 0.140** | | 0.419** |
| 31 Electrical machinery and apparatus | -0.076** | 0.322** | 0.355** | -0.158** | 0.016 | 0.012 | 0.186** | 0.104** | 0.170** | 0.180** |
| 32 Radio, television and communication equipment | -0.105** | -0.146** | 0.365** | -0.374* | 0.198** | 0.110** | 0.334** | 0.158** | 0.316** | 0.210** |
| 33 Medical, precision and optical instruments, watches and clocks | -0.164** | 0.174** | 0.315** | 0.143** | -0.065** | 0.062** | 0.172** | 0.195** | 0.186** | 0.324** |
| 34 Motor vehicles, trailers and semi-trailers | 0.223** | 0.078* | 0.06 | 0.476** | 0.024** | 0.029** | 0.167** | -0.004 | 0.157** | 0.359** |
| 35 Other transport equipment | 0.103** | 0.331** | 0.565** | 0.159** | 0.026° | -0.003 | 0.182** | 0.072** | 0.301** | 0.280** |
| 36 Furniture, manufacturing | -0.150** | -0.022 | -0.074** | -0.350** | -0.251** | -0.225** | -0.065 | -0.093** | -0.234** | -0.167** |
| 37 Recycling | -0.101** | -0.214** | -0.149* | -0.311** | -0.288** | -0.189** | -0.089 | -0.023 | -0.025 | 0.076 |
| 40 Electricity, gas, steam and hot water supply | 0.254** | 0.909** | 0.547** | 0.532** | 0.460** | 0.405** | 0.373** | 0.035** | 0.972** | 0.910** |
| 41 Collection, purification and distribution of water | 0.182** | | -0.131** | 0.025 | | 0.250** | 0.482** | | 0.550** | 0.224** |
| 45 Construction | -0.032** | -0.117** | -0.181** | -0.267** | -0.166** | -0.133** | 0.102** | 0.011** | -0.086** | -0.178** |
| 50 Sale, maintenance and repair of motor vehicles and motorcycles | -0.041 | -0.087** | | 0.009 | -0.007 | -0.031** | -0.047 | -0.074** | 0.077** | 0.027° |

| | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| 51 Wholesale trade | 0.060* | -0.001 | 0.166** | -0.018 | 0.060** | 0.078** | 0.080* | 0.094** | 0.149** | 0.043** |
| 52 Retail trade | -0.339** | -0.309** | -0.197** | -0.250** | -0.209** | -0.075** | -0.427** | -0.277** | -0.266** | -0.207** |
| 55 Hotels and restaurants | -0.377** | -0.342** | -0.431** | -0.473** | -0.473** | -0.265** | -0.394** | -0.276** | -0.329** | -0.319** |
| 60 Land transport; transport via pipelines | 0.028** | -0.250** | -0.466** | 0.110** | -0.345** | -0.006 | -0.121 | -0.101** | 0.065** | -0.040** |
| 61 Water transport | | 0.787** | 0.713** | | -0.039 | 0.266** | 0.289** | 0.087** | 0.449** | |
| 62 Air transport | 1.272** | 0.270** | 0.11 | 0.352** | 0.096* | 0.352** | 0.355** | 0.250** | 0.618** | 0.578** |
| 63 Transport activities | 0.130** | 0.414** | 0.242** | -0.070* | -0.095** | 0.037* | 0.087 | -0.026** | 0.463** | 0.033* |
| 64 Post and telecommunications | 0.779** | 1.247** | 0.815** | 0.406** | 0.155** | -0.282* | 0.082** | 0.166** | 0.942** | 0.689** |
| 65 Financial intermediation | 0.582** | 1.044** | 0.892** | 0.643** | 0.316** | 0.650** | 0.485** | 0.156** | 0.898** | 0.867** |
| 66 Insurance and pension funding | 0.467** | 0.648** | 0.439** | 0.233** | 0.260** | 0.477** | 0.417** | 0.188** | 0.955** | 0.512** |
| 67 Activities auxiliary to financial intermediation | 0.667** | 0.072 | -0.120° | 0.534** | 0.254** | 0.200** | 0.286** | 0.427** | 0.796** | 0.464** |
| 70 Real estate activities | 0.102** | -0.107** | -0.026 | 0.119** | -0.116** | 0.043 | 0.413** | 0.061** | 0.119° | 0.021 |
| 71 Renting of machinery | 0.643** | 0.734** | -0.023 | 0.251** | -0.008 | 0.086* | -0.108 | -0.073** | 0.157** | -0.215** |
| 72 Computer and related activities | 0.238* | 0.827** | 0.395** | 0.586** | 0.202** | 0.235** | 0.393** | 0.356** | 0.751** | 0.217** |
| 73 Research and development | 0.151** | 0.158° | -0.026 | 0.358** | 0.171** | 0.176** | 0.475** | 0.257** | 0.549** | 0.443** |
| 74 Other businesses activities | -0.160** | 0.069** | -0.089** | -0.155** | -0.111** | -0.150** | -0.270** | 0.044** | 0.177** | -0.220** |

**/*/°: Coefficient significant at the 1, 5 and 10 per cent level, respectively.

Results show, for all countries, the existence of substantial wage differentials between workers employed in different sectors. These are significant at the 1% level, both in individual terms (with a few exceptions) and globally. Moreover, we find that the hierarchy of sectors in terms of wages is quite similar across European countries (see Appendix 2).[5] Among the best paid sectors we find the extraction of crude petroleum and natural gas industry, the coking, refining and nuclear industry, the chemical industry, the production and distribution of electricity, gas, steam and hot water, the air transport sector, the financial sector, and computer activities. Notice that the size of the wage differentials associated with these sectors fluctuates substantially. For instance, we find that the average worker in the extraction of crude petroleum and natural gas industry earns between 50.8% (in the Czech Republic) and 315.6% (in Lithuania) more than the average worker in the whole economy.[6] In the coking, refining and nuclear industry, these percentages vary between 46.3% in Italy and 365.8% in Lithuania. At the bottom of the wage distribution, we find traditional sectors, including the clothing and fur industry, the leather and footwear industry, woodwork and the manufacture of articles in wood, cork and esparto, retail trade, and hotels and restaurants. Again,

[5] Spearman correlation coefficients between *gross* inter-industry wage differentials computed for different countries are significant at the 1% level. Their value fluctuates between 46% and 86%.

[6] In order to get the difference in percentage between the wage (in euros) of the average worker in sector *m* and the employment-share weighted mean wage (in euros) in the economy, the following expressions have been computed:

$$v_m = \left[ (\exp(\hat{\psi}_m) - 1) - \sum_{m=1}^{M} \overline{p}_m (\exp(\hat{\psi}_m) - 1) \right],$$

where $\overline{p}_m$ (for $m = 1,\ldots,M+1$) is the sectoral employment share. This transformation is necessary because the estimated wage equation has a semi-logarithmic form (for a discussion see Reilly and Zanchi, 2003). See Appendix 1 for results expressed in percentage terms.

substantial differences are observed in the wage differentials associated with these sectors. For instance, workers in the clothing and fur industry earn between almost 20% (in the Netherlands) and 60% (in the Czech Republic) less than the average worker in the economy. In the retail trade, these percentages vary between –10.4% in Italy and –59.6% in the Netherlands. Finally, the average worker in the hotels and restaurants sector is found to earn between 27.8% (in Italy) and 49.3% (in Lithuania) less than the average worker in the whole economy.

**Table 4: Net inter-industry wage differentials (i.e. controlling for employee, job and employer characteristics, except the level of wage bargaining), in log points**

| | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 Mining of coal and lignite, extraction of peat | 0.283** | 0.403** | 0.180** | -0.015 | -0.184** | -0.228** | | 0.122** | | 0.428** |
| 11 Extraction of crude petroleum and natural gas | 0.037° | | 1.115** | 0.351** | | 0.260° | 0.358** | 0.368** | | 0.188** |
| 12 Mining of uranium and thorium ores | | | | | | | | | -0.112* | |
| 13 Mining of metal ores | | | | -0.645** | | | | 0.078** | 0.019 | -0.246* |
| 14 Other mining and quarrying | 0.256** | 0.400** | 0.270** | 0.221** | 0.005 | 0.034* | 0.107 | 0.072** | 0.062* | 0.129** |
| 15 Food products and beverages | -0.028** | | -0.053** | -0.134** | | 0.060** | 0.071* | -0.025** | -0.045** | -0.066** |
| 16 Tobacco products | 0.555** | | 0.947** | 0.371** | 0.040** | 0.24 | 0.071° | -0.027** | 0.045 | 0.253** |
| 17 Textiles | -0.108** | -0.103** | -0.111** | -0.204** | -0.127** | -0.027* | -0.122* | -0.080** | -0.146** | -0.136** |
| 18 Clothing | -0.215** | -0.073** | -0.089** | -0.138** | -0.086** | -0.111** | -0.175° | -0.132** | -0.182** | -0.137** |
| 19 Leather | -0.292** | -0.213** | -0.128** | -0.152** | -0.114** | -0.120** | -0.132 | -0.077** | -0.113** | -0.160** |
| 20 Wood and cork | -0.009 | -0.080** | -0.124** | -0.070* | -0.132** | -0.123** | -0.108* | -0.100** | -0.016 | -0.112** |
| 21 Paper | 0.117** | 0.075** | 0.255** | 0.169** | 0.050** | 0.032** | 0.024 | -0.032** | 0.099** | 0.032** |
| 22 Printing and publishing | 0.043° | | 0.034 | 0.033° | 0.044** | 0.117** | 0.044 | 0.046** | 0.118** | 0.054** |
| 23 Coke, refined petroleum products and nuclear fuel | 0.228** | | 0.756** | 0.500** | 0.171** | 0.230** | 0.227** | 0.132** | | 0.321** |
| 24 Chemical and chemical products | 0.050** | 0.017 | 0.163** | -0.108** | 0.107** | 0.121** | 0.074* | 0.062** | 0.218** | 0.132** |
| 25 Rubber and plastic products | 0.138** | -0.053** | 0.094** | 0.127** | -0.036** | -0.018* | -0.066 | -0.045** | -0.025 | 0.064** |
| 26 Other non-metallic mineral products | 0.105** | 0.126** | 0.109** | -0.062** | 0.008 | 0.023** | -0.048 | -0.016** | 0.060** | 0.063** |
| 27 Basic metals | 0.016° | -0.150** | -0.130** | 0.234** | -0.008 | 0.032** | 0.051 | 0.049** | 0.001 | 0.092** |
| 28 Fabricated metal products | -0.004 | 0.013 | -0.044* | -0.075** | -0.041** | 0.01 | -0.001 | -0.026** | 0.008 | 0.029** |
| 29 Machinery and equipment | -0.069** | -0.165** | -0.063** | -0.062** | -0.004 | 0.038** | 0.007 | 0.012** | 0.047** | 0.042** |
| 30 Office machinery and computers | -0.167** | 0.542** | -0.227** | 0.101** | -0.118** | -0.022 | -0.087* | -0.011 | | -0.064 |
| 31 Electrical machinery and apparatus | -0.025** | 0.022 | 0.092** | -0.077** | -0.023** | -0.011 | -0.09 | 0.036** | 0.045** | 0.017* |
| 32 Radio, television and communication equipment | -0.011 | -0.094** | -0.060* | -0.395** | 0.079** | -0.009 | 0.02 | 0.025** | 0.048° | 0.016 |
| 33 Medical, precision and optical instruments, watches and clocks | -0.133** | -0.069* | 0.147** | 0.024 | -0.038** | -0.001 | -0.125* | 0.054** | -0.124 | -0.018 |
| 34 Motor vehicles, trailers and semi-trailers | 0.191** | 0.043 | 0.002 | 0.478** | 0.010° | -0.002 | -0.014 | -0.032** | 0.084** | 0.054** |
| 35 Other transport equipment | -0.044** | 0.02 | 0.219** | 0.004 | -0.061** | -0.061** | -0.016 | 0.016** | 0.108** | 0.044** |
| 36 Furniture, manufacturing | -0.070** | 0.001 | -0.094** | -0.132** | -0.153** | -0.116** | -0.238 | -0.043** | -0.111** | -0.092** |
| 37 Recycling | -0.118** | -0.013 | -0.008 | -0.303** | -0.081** | -0.056** | -0.234* | 0.027* | 0.128* | 0.107** |

| | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| 40 Electricity, gas, steam and hot water supply | 0.110** | 0.276** | 0.247** | 0.226** | 0.292** | 0.170** | 0.099** | -0.065** | 0.387** | 0.295** |
| 41 Collection, purification and distribution of water | 0.030** | | -0.106** | -0.052* | | 0.136** | 0.140** | | 0.250** | 0.049** |
| 45 Construction | -0.041** | -0.079** | -0.018 | -0.169** | -0.051** | -0.022° | 0.069* | 0.039** | -0.027* | 0.071** |
| 50 Sale, maintenance and repair of motor vehicles and motorcycles | -0.047 | 0.002 | | 0.159** | 0.009 | 0.016° | 0.003 | -0.043** | 0.044** | -0.024* |
| 51 Wholesale trade | 0.079** | 0.072** | 0.162** | 0.066* | 0.010* | 0.042** | 0.025 | 0.006** | 0.050** | -0.007 |
| 52 Retail trade | -0.203** | -0.164** | -0.062** | -0.022 | -0.052** | 0.009 | -0.043 | -0.113** | -0.180** | -0.100** |
| 55 Hotels and restaurants | 0.019 | -0.021 | -0.091** | -0.081** | -0.220** | -0.140** | 0.001 | -0.031** | -0.124** | -0.074** |
| 60 Land transport; transport via pipelines | 0.005 | -0.148** | -0.249** | -0.090** | -0.144** | 0.026* | -0.109 | -0.024** | 0.011 | 0.01 |
| 61 Water transport | | 0.718** | 0.153** | | -0.026 | 0.181** | -0.037 | 0.012** | 0.224** | |
| 62 Air transport | 1.370** | 0.154** | 0.021 | 0.315** | 0.098** | 0.350** | 0.199** | 0.183** | 0.243** | 0.201** |
| 63 Transport activities | 0.210** | 0.274** | 0.189** | 0.042 | -0.017* | 0.027* | 0.090° | -0.007* | 0.316** | 0.015 |
| 64 Post and telecommunications | 0.531** | 0.947** | 0.466** | 0.093** | 0.037** | -0.432** | 0.095** | 0.080** | 0.500** | 0.149** |
| 65 Financial intermediation | 0.189** | 0.508** | 0.447** | 0.393** | 0.072** | 0.329** | 0.267** | -0.052** | 0.440** | 0.291** |
| 66 Insurance and pension funding | 0.231** | 0.062° | 0.307** | 0.094** | 0.087** | 0.197** | 0.158** | -0.053** | 0.355** | 0.040** |
| 67 Activities auxiliary to financial intermediation | 0.494** | 0.122 | 0.148* | 0.349** | 0.026* | 0.095** | 0.342** | 0.238** | 0.411** | 0.135** |
| 70 Real estate activities | 0.028* | 0.084** | 0.161** | 0.086** | -0.018 | 0.018 | 0.149** | 0.028** | 0.079° | 0.036 |
| 71 Renting of machinery | 0.531** | 0.711** | 0.118 | 0.225** | 0.026* | 0.082** | -0.086 | -0.001 | 0.077** | -0.046 |
| 72 Computer and related activities | -0.049 | 0.546** | 0.257** | 0.332** | -0.009 | 0.096** | 0.072 | 0.132** | 0.227** | -0.048** |
| 73 Research and development | -0.107** | -0.089 | -0.03 | -0.102** | -0.029* | 0.023 | 0.101* | -0.073** | 0.290** | -0.093* |
| 74 Other businesses activities | -0.061** | 0.182** | 0.002 | -0.01 | -0.025** | -0.131** | -0.148** | 0.023** | 0.153** | -0.102** |

**/*/°: Coefficient significant at the 1, 5 and 10 per cent level, respectively.

Table 4 reports the *net* inter-industry wage differentials, that is, stripped of employee, job and employer characteristics (as described in equation (1)).[7] Results show that substantial earnings differences across sectors persist in all countries after controlling for a large range of potential composition effects. The vast majority of these differentials are still significant at the 1% level. Also noteworthy is that the hierarchy of sectors in terms of wages remains almost unchanged in all countries.[8] Among high-wage sectors, we still find the energy (coke, petroleum, gas, electricity and nuclear power), chemical, financial and computer industries. Moreover, it is still in the traditional sectors (wood and cork industry, textile, clothing and leather industry, hotels and restaurants, and retailing) that wages are lowest.[9] However, the size of the inter-industry wage

[7] We do not control for the level of wage bargaining as this variable is not available for Norway and the Netherlands. Results in percentage terms are reported in Appendix 3.

[8] Spearman correlation coefficients between *net* inter-industry wage differentials recorded for different countries are generally significant at the 1% level. Their value varies between 27% and 68%. See Appendix 4.

[9] These results could be altered by the inclusion of firm and worker fixed effects. Since a longitudinal data set including the same quality of information is not available at the European level, we cannot use panel data techniques to control for these effects. But we note that several studies confirm the existence of industry differentials even when individual and firm effects are controlled for. Another option for

differentials is substantially reduced after the introduction of control variables for employee, job and employer characteristics. Notice, for instance, that the wage premium for someone employed in the extraction of crude petroleum and natural gas industry drops from 50.8% to 3.5% in the Czech Republic and from 315.6% to 216.4% in Lithuania. In the coking, refining and nuclear industry, the average worker now earns 15.5% in Norway and 118.6% in Lithuania more than the average worker in the whole economy, ceteris paribus. The wage premium in this sector is thus approximately divided by 3 in Norway and Lithuania. At the other side of the wage distribution, we find, for example, that the wage penalty in the hotels and restaurants sector decreases from 27.8% to 13.7% in Italy and from 49.3% to 10.8% in Lithuania.

**Table 5: Dispersion (WASD) of inter-industry wage differentials**

| Model: | **CZ** | **LV** | **LT** | **SL** | **BE** | **IT** | **NL** | **NO** | **PT** | **ES** |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Including **only sectoral dummies**: | 0.219 | 0.328 | 0.298 | 0.287 | 0.184 | 0.209 | 0.281 | 0.169 | 0.279 | 0.296 |
| 2. Controlling for **employee characteristics**: | 0.145 | 0.243 | 0.229 | 0.182 | 0.111 | 0.133 | 0.132 | 0.103 | 0.185 | 0.132 |
| 3. Controlling for **employee and job characteristics**: | 0.128 | 0.209 | 0.203 | 0.194 | 0.085 | 0.125 | 0.102 | 0.075 | 0.150 | 0.112 |
| 4. Controlling for **employee, job and employer characteristics**, excluding the level of wage bargaining: | 0.123 | 0.180 | 0.162 | 0.161 | 0.076 | 0.121 | 0.103 | 0.074 | 0.137 | 0.101 |

What about the dispersion of inter-industry wage differentials? Table 5 shows that the weighted adjusted standard deviation (WASD) of the inter-industry wage differentials is substantially reduced when controlling for employee, job and employer characteristics. Indeed, the WASD drops by between 42% (in Italy) and 66% (in Spain) when controlling for composition effects. Moreover, we find that the dispersion of inter-industry wage differentials fluctuates considerably between countries. It varies from 0.074 in Norway to 0.180 in Latvia. Results for Western European countries (except those for the Netherlands)[10] are in line with the literature (see, for example, Albaek *et al.*, 1996 for Norway; Rycx, 2002 and Plasman *et al.*, 2006 for Belgium; Hartog *et al.*, 2000 for Portugal; and Casado-Diaz and Simón, 2007 for Spain). We find indeed that the structure of inter-industry wage differentials is relatively compressed in Norway and Belgium and fairly dispersed in Italy, Spain and (in particular) Portugal. Results for Eastern European countries are remarkable. Indeed, they indicate that the dispersion of inter-industry wage differentials in the Czech Republic is of the same order of magnitude as in Southern European countries, that is, comparable to figures recorded for

investigating firm effects relies on the inclusion of dummy variables for each firm in the cross-sectional wage equation (Gannon and Nolan, 2004). However, results obtained in this way should not be over-interpreted, particularly because there are in some cases only a small number of firms in a given sector in the data. In addition, it is not clear from a theoretical perspective how such firm effects might be interpreted. Goux and Maurin (1999) mention firm size as important, for example, but that is already included separately as a control variable in our model.

[10] Our findings show that the dispersion of inter-industry wage differentials is relatively big in the Netherlands; that is, of the same order of magnitude as in Spain. However, according to Hartog *et al.* (1997) and Teulings and Hartog (1998), results for the Netherlands would be substantially smaller (that is, slightly higher than those recorded for the Scandinavian countries).

the Anglo-Saxon countries.[11] As regards Latvia, Lithuania and Slovakia, we find that the dispersion of industry wage premia is well above those reported for Western European countries and even for the Anglo-American world.[12]

**Table 6: Dispersion of inter-industry wage differentials and collective bargaining characteristics**

| | WASDa | Degree of centralisation e | Degree of coordination e | Unions coverage rate d | Union density c |
|---|---|---|---|---|---|
| **NOb** | 0.074 | / | 4.5 | 70 | 54 |
| **BE** | 0.076 | 0.61 | 4 | 96 | 69 |
| **ES** | 0.101 | 0.38 | 3 | 81 | 15 |
| **NL** | 0.103 | 0.58 | 4 | 81 | 25 |
| **IT** | 0.121 | 0.34 | 2.5 | 70 | 35 |
| **CZ** | 0.123 | 0.27 | 1 | 35 | 30 |
| **PT** | 0.137 | 0.30 | 2 | 87 | 30 |
| **SL** | 0.161 | 0.33 | 2 | 50 | 35 |
| **LT** | 0.162 | 0.23 | 1 | 15 | 15 |
| **LV** | 0.180 | 0.30 | 1.5 | 20 | 30 |
| **Correlations (with WASD)** | | –0.76* | –0.84** | –0.75* | –0.55° |

[a] Weighted adjusted standard deviation of industry wage differentials. [b] All information on collective bargaining characteristics in Norway are taken from OECD (2004). [c] EIRO (2004). [d] EIRO (2007). [e] European Commission (2004). The degree of centralisation is measured as in Iversen (1999). A large value is associated with a highly centralised country. The scale ranges between 0 (at the limit) and 1. The degree of coordination: 5 = explicit coordination between and within peak associations of unions and employers, through agreements at the national and sectoral level; 4 = explicit coordination between peak federations through agreements only at the national level or implicit coordination (without agreement) within confederations (unions or employers) at the national and sectoral level; 3 = implicit coordination through synchronisation of sectoral bargaining and pattern-setting; 2 = implicit coordination and irregular or incomplete pattern-setting; 1 = no coordination at the national or sectoral level. **/*/°: Coefficient significant at the 1, 5 and 10 per cent level, respectively.

[11] For a comparison of the dispersion of inter-industry wage differentials in Southern European and Anglo-Saxon countries see, for example, Hartog *et al.* (2000), Casado-Diaz and Simón (2007) and Gannon *et al.* (2007).

[12] It is important to note that the data only refer to establishments with 10 or more workers. This limitation may be prejudicial since low pay prevails in small firms (Lucifora *et al.*, 2005). One might generally expect that inter-industry wage differentials differ by firm size. For instance, smaller firms are likely to have less detailed job descriptions and no seniority-based automatic wage adjustments. This may lead to a smaller bandwidth of wage differences in these firms. Alternatively, there is a large body of empirical evidence supporting the existence of firm-size wage differentials (Oi and Idson, 1999; Lallemand *et al.*, 2007). If firms of different sizes are not distributed uniformly over industries, this might bias the results (although the main effects will be picked up by the inclusion of firm size in the wage equation). Overall, whether the omission of small firms leads to an over- or underestimation of the true dispersion of inter-industry wage differentials remains an open question. For example, Rycx (2002) cites results calculated on Dutch data (Loonstructuuronderzoek) that, excluding firms with fewer than 10 employees, reduce the dispersion of the industry wage differentials (estimated for 23 sectors) for 1996 and 1997 by 6% and 5% respectively. These findings suggest that differences in the weighted-adjusted standard deviation due to the omission of small establishments are noteworthy, but not that large. The proportion of all employees working in establishments with fewer than 10 employees is different across countries, so it is unclear whether this conclusion also holds for other European countries.

Several arguments could be put forward for these differences across countries. Teulings and Hartog (1998) argued that countries with lower dispersion have a higher degree of corporatism. We test this hypothesis by examining the correlation between the dispersion of inter-industry wage differentials and collective bargaining characteristics, that is, the degree of centralisation, the degree of coordination among the social partners, the trade union coverage rate and trade union density.[13] Results, reported in Table 6, show the existence of a significant and negative relationship between the WASD of the net inter-industry wage differentials and all collective bargaining characteristics under consideration. In Eastern European countries, the data reflect much less centralisation and coordination compared to Belgium and Norway, and also show higher dispersion in the former countries. Indeed, results from the simple correlation coefficients suggest that industry wage differentials are more dispersed in countries where wage bargaining is weakly coordinated and essentially organised at the firm or establishment level. Moreover, findings indicate that the inter-industry wage structure tends to be less compressed when the proportion of workers covered by a collective agreement is relatively small (namely in Eastern European countries). The same type of relationship, albeit less strong and significant, is found with trade union density. Overall, our results fit in well with findings from earlier studies on the existence of a negative relationship between the dispersion of inter-industry wage differentials and the degree of corporatism (Hartog *et al.*, 1997; Kahn, 1998; Rycx, 2002; Gannon *et al.*, 2007).

## 6. Conclusion

In this paper, we compared the structure and determinants of inter-industry wage differentials in Eastern and Western European countries (Belgium, Italy, the Netherlands, Norway, Portugal and Spain compared with Latvia, Lithuania, the Czech Republic and Slovakia). To do so, we used a unique harmonised, linked employer-employee data set, the 2002 European Structure of Earnings Survey. This survey contains detailed information, provided by the management of establishments, both on individual workers (for example, gross hourly wages, bonuses, age, education, tenure, sex, occupation, employment contract, working time) and employers' characteristics (for example, sector of activity, size of establishment, level of wage bargaining, region). Although the effect of sectoral affiliation on workers' wages has been a topic of great interest, the evidence for Eastern European countries is scarce (Chase, 1998; Newell, 2001; Geishecker and Haisken-DeNew, 2002). Moreover, little is known on how inter-industry wage structures differ between Eastern and Western European countries.

[13] The degree of centralisation refers strictly to the principal level at which bargaining occurs (establishment, firm, industry or national level). 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 (that is, 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, 2004).

Empirical findings, reported in this paper, show the existence of substantial differences in earnings across sectors in all countries, even when controlling for a wide range of employee, job and employer characteristics. They also indicate that the hierarchy of sectors in terms of wages is quite similar in Eastern and Western European countries. Among high-wage sectors, we find the energy (coke, petroleum, gas, electricity and nuclear power), chemical, financial and computer industries. In contrast, it is in the traditional sectors (wood and cork industry, textile, clothing and leather industry, hotels and restaurants, and retailing) that wages are lowest. Further results show that the dispersion of inter-industry wage differentials fluctuates considerably across countries. In line with the literature, we find that the structure of inter-industry wage differentials is relatively compressed in Norway and Belgium and fairly dispersed in Italy, Spain and (in particular) Portugal. Results for Eastern European countries are remarkable. Indeed, they show that the dispersion of inter-industry wage differentials in the Czech Republic is of the same order of magnitude as in Southern European countries, that is, comparable to figures recorded for the Anglo-Saxon countries. As regards Latvia, Lithuania and Slovakia, we find that the dispersion of industry wage premia is well above those reported for Western European countries and even for the Anglo-American world. To understand these differences across countries, we examined the correlation between the dispersion of industry wage premia and collective bargaining characteristics. Results suggest that inter-industry wage differentials are more dispersed in countries where wage bargaining is weakly coordinated and essentially organised at the firm or establishment level. They also indicate that the wage structure is more compressed in countries where the proportion of workers covered by a collective agreement or affiliated to a trade union is high. Our findings thus support the hypothesis of a negative relationship between the dispersion of inter-industry wage differentials and a country's degree of corporatism.

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# Appendix 1: Gross inter-industry wage differentials

(i.e. estimated without control variables), in percentage terms

| | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 Mining of coal and lignite, extraction of peat | 0.758 | 0.240 | 0.118 | 0.450 | -0.315 | -0.132 | | 0.257 | | 0.935 |
| 11 Extraction of crude petroleum and natural gas | 0.508 | | 3.156 | 0.943 | | 0.633 | 1.788 | 0.939 | | 1.542 |
| 12 Mining of uranium and thorium ores | | | | | | | | | 0.639 | |
| 13 Mining of metal ores | | | | -0.607 | | | | 0.136 | -0.057 | 0.173 |
| 14 Other mining and quarrying | 0.547 | 0.682 | 0.211 | 0.081 | -0.120 | -0.056 | 0.915 | 0.060 | -0.014 | -0.004 |
| 15 Food products and beverages | -0.185 | | -0.052 | -0.287 | | -0.003 | 0.245 | -0.143 | -0.125 | -0.122 |
| 16 Tobacco products | 2.157 | | 4.459 | 0.561 | -0.082 | 0.571 | 0.814 | -0.027 | -0.123 | 1.083 |
| 17 Textiles | -0.310 | 0.239 | 0.047 | -0.450 | -0.311 | -0.104 | 0.126 | -0.204 | -0.275 | -0.200 |
| 18 Clothing | -0.593 | -0.274 | -0.213 | -0.421 | -0.227 | -0.335 | -0.199 | -0.288 | -0.476 | -0.459 |
| 19 Leather | -0.540 | -0.574 | -0.090 | -0.460 | -0.216 | -0.275 | -0.114 | -0.198 | -0.429 | -0.443 |
| 20 Wood and cork | -0.127 | -0.278 | -0.358 | -0.305 | -0.292 | -0.235 | 0.100 | -0.171 | -0.188 | -0.275 |
| 21 Paper | 0.096 | 0.051 | 0.565 | 0.406 | -0.017 | 0.034 | 0.341 | -0.004 | 0.337 | 0.276 |
| 22 Printing and publishing | -0.026 | | 0.060 | -0.030 | 0.065 | 0.156 | 0.401 | 0.147 | 0.368 | 0.281 |
| 23 Coke, refined petroleum products and nuclear fuel | 0.719 | | 3.658 | 0.987 | 0.475 | 0.463 | 1.666 | 0.747 | | 1.886 |
| 24 Chemical and chemical products | 0.223 | 0.381 | 0.726 | 0.122 | 0.254 | 0.317 | 0.778 | 0.272 | 0.746 | 0.657 |
| 25 Rubber and plastic products | 0.065 | -0.241 | -0.049 | 0.238 | -0.078 | -0.064 | 0.152 | -0.093 | -0.077 | 0.183 |
| 26 Other non-metallic mineral products | 0.111 | 0.195 | 0.197 | -0.092 | -0.052 | -0.027 | 0.332 | -0.026 | 0.091 | 0.104 |
| 27 Basic metals | 0.148 | 0.879 | 0.444 | 0.682 | 0.046 | 0.031 | 0.582 | 0.128 | 0.173 | 0.605 |
| 28 Fabricated metal products | -0.033 | -0.054 | -0.153 | -0.168 | -0.149 | -0.083 | -0.023 | -0.051 | -0.083 | 0.015 |
| 29 Machinery and equipment | 0.029 | 0.116 | 0.305 | -0.108 | 0.004 | 0.030 | 0.459 | 0.057 | 0.141 | 0.227 |
| 30 Office machinery and computers | -0.195 | 0.707 | -0.373 | -0.158 | -0.143 | 0.012 | 0.445 | 0.179 | | 0.577 |
| 31 Electrical machinery and apparatus | -0.139 | 0.426 | 0.453 | -0.245 | -0.002 | -0.014 | 0.251 | 0.125 | 0.182 | 0.179 |
| 32 Radio, television and communication equipment | -0.176 | -0.278 | 0.470 | -0.457 | 0.249 | 0.099 | 0.544 | 0.207 | 0.426 | 0.224 |
| 33 Medical, precision and optical instruments, watches and clocks | -0.249 | 0.167 | 0.384 | 0.141 | -0.099 | 0.042 | 0.224 | 0.265 | 0.208 | 0.407 |
| 34 Motor vehicles, trailers and semi-trailers | 0.315 | 0.019 | 0.009 | 0.726 | 0.009 | 0.005 | 0.216 | -0.025 | 0.163 | 0.468 |
| 35 Other transport equipment | 0.115 | 0.442 | 0.858 | 0.164 | 0.011 | -0.030 | 0.242 | 0.079 | 0.399 | 0.334 |
| 36 Furniture, manufacturing | -0.232 | -0.121 | -0.154 | -0.436 | -0.295 | -0.244 | -0.160 | -0.136 | -0.332 | -0.253 |
| 37 Recycling | -0.172 | -0.354 | -0.235 | -0.400 | -0.330 | -0.212 | -0.194 | -0.049 | -0.091 | 0.034 |
| 40 Electricity, gas, steam and hot water supply | 0.370 | 1.926 | 0.821 | 0.845 | 0.698 | 0.511 | 0.629 | 0.028 | 2.086 | 1.761 |
| 41 Collection, purification and distribution of water | 0.244 | | -0.216 | -0.025 | | 0.280 | 0.887 | | 0.897 | 0.245 |
| 45 Construction | -0.080 | -0.242 | -0.269 | -0.357 | -0.210 | -0.161 | 0.102 | -0.005 | -0.166 | -0.264 |
| 50 Sale, maintenance and repair of motor vehicles and motorcycles | -0.093 | -0.205 | | -0.045 | -0.029 | -0.060 | -0.133 | -0.113 | 0.045 | -0.030 |
| 51 Wholesale trade | 0.050 | -0.094 | 0.153 | -0.079 | 0.055 | 0.060 | 0.064 | 0.111 | 0.150 | -0.010 |
| 52 Retail trade | -0.441 | -0.454 | -0.285 | -0.241 | -0.254 | -0.104 | -0.596 | -0.338 | -0.365 | -0.294 |
| 55 Hotels and restaurants | -0.477 | -0.487 | -0.493 | -0.340 | -0.486 | -0.278 | -0.563 | -0.337 | -0.425 | -0.340 |
| 60 Land transport; transport via pipelines | 0.004 | -0.393 | -0.520 | -0.541 | -0.381 | -0.033 | -0.238 | -0.146 | 0.028 | -0.112 |
| 61 Water transport | | 1.539 | 1.200 | | -0.069 | 0.301 | 0.451 | 0.100 | 0.680 | |
| 62 Air transport | 3.568 | 0.330 | 0.075 | 0.091 | 0.104 | 0.427 | 0.590 | 0.356 | 1.057 | 0.899 |
| 63 Transport activities | 0.158 | 0.606 | 0.267 | 0.485 | -0.133 | 0.014 | 0.076 | -0.053 | 0.710 | -0.022 |
| 64 Post and telecommunications | 1.620 | 3.284 | 1.468 | -0.144 | 0.186 | -0.291 | 0.068 | 0.218 | 1.984 | 1.156 |
| 65 Financial intermediation | 1.072 | 2.417 | 1.686 | 0.586 | 0.437 | 0.960 | 0.893 | 0.203 | 1.840 | 1.633 |
| 66 Insurance and pension funding | 0.799 | 1.149 | 0.605 | 1.101 | 0.346 | 0.631 | 0.729 | 0.254 | 2.028 | 0.759 |
| 67 Activities auxiliary to financial intermediation | 1.295 | 0.010 | -0.204 | 0.280 | 0.335 | 0.212 | 0.443 | 0.682 | 1.529 | 0.663 |
| 70 Real estate activities | 0.114 | -0.230 | -0.098 | 0.849 | -0.156 | 0.021 | 0.721 | 0.064 | 0.105 | -0.038 |
| 71 Renting of machinery | 1.231 | 1.383 | -0.095 | 0.105 | -0.031 | 0.071 | -0.220 | -0.112 | 0.162 | -0.302 |
| 72 Computer and related activities | 0.341 | 1.661 | 0.524 | 0.309 | 0.255 | 0.258 | 0.676 | 0.545 | 1.401 | 0.234 |
| 73 Research and development | 0.192 | 0.141 | -0.098 | 0.966 | 0.209 | 0.181 | 0.869 | 0.367 | 0.895 | 0.623 |
| 74 Other businesses activities | -0.244 | 0.005 | -0.171 | 0.495 | -0.151 | -0.177 | -0.426 | 0.040 | 0.193 | -0.306 |

# Appendix 2: Spearman correlation coefficients between gross inter-industry wage differentials

(i.e. estimated without control variables)

| | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| **CZ** | 1.000 | | | | | | | | | |
| **LV** | 0.627** | 1.000 | | | | | | | | |
| **LT** | 0.516** | 0.756** | 1.000 | | | | | | | |
| **SL** | 0.745** | 0.670** | 0.600** | 1.000 | | | | | | |
| **BE** | 0.517** | 0.632** | 0.605** | 0.696** | 1.000 | | | | | |
| **IT** | 0.611** | 0.556** | 0.632** | 0.694** | 0.744** | 1.000 | | | | |
| **NL** | 0.524** | 0.519** | 0.656** | 0.647** | 0.715** | 0.753** | 1.000 | | | |
| **NO** | 0.554** | 0.505** | 0.548** | 0.651** | 0.717** | 0.633** | 0.785** | 1.000 | | |
| **PT** | 0.649** | 0.771** | 0.463** | 0.728** | 0.858** | 0.698** | 0.600** | 0.779** | 1.000 | |
| **ES** | 0.679** | 0.680** | 0.732** | 0.784** | 0.742** | 0.753** | 0.768** | 0.753** | 0.803** | 1.000 |

**/*/°: Coefficient significant at the 1, 5 and 10 per cent level, respectively.

# Appendix 3: Net inter-industry wage differentials

(i.e. controlling for employee, job and employer characteristics, except the level of wage bargaining), in percentage terms

| | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 Mining of coal and lignite, extraction of peat | 0.390 | 0.562 | 0.194 | -0.029 | -0.180 | -0.210 | | 0.142 | | 0.584 |
| 11 Extraction of crude petroleum and natural gas | 0.035 | | 2.164 | 0.415 | | 0.287 | 0.442 | 0.494 | | 0.222 |
| 12 Mining of uranium and thorium ores | | | | | | | | | -0.139 | |
| 13 Mining of metal ores | | | | -0.500 | | | | 0.088 | 0.010 | -0.247 |
| 14 Other mining and quarrying | 0.348 | 0.557 | 0.314 | 0.239 | 0.002 | 0.027 | 0.112 | 0.081 | 0.064 | 0.146 |
| 15 Food products and beverages | -0.044 | | -0.071 | -0.142 | | 0.053 | 0.070 | -0.030 | -0.065 | -0.076 |
| 16 Tobacco products | 0.899 | | 1.664 | 0.445 | 0.040 | 0.261 | 0.070 | -0.033 | 0.044 | 0.312 |
| 17 Textiles | -0.136 | -0.137 | -0.128 | -0.203 | -0.128 | -0.034 | -0.126 | -0.089 | -0.175 | -0.147 |
| 18 Clothing | -0.247 | -0.105 | -0.107 | -0.146 | -0.090 | -0.112 | -0.174 | -0.142 | -0.211 | -0.148 |
| 19 Leather | -0.320 | -0.248 | -0.144 | -0.158 | -0.117 | -0.119 | -0.135 | -0.087 | -0.140 | -0.169 |
| 20 Wood and cork | -0.021 | -0.113 | -0.140 | -0.083 | -0.134 | -0.122 | -0.114 | -0.110 | -0.031 | -0.124 |
| 21 Paper | 0.143 | 0.070 | 0.294 | 0.174 | 0.050 | 0.025 | 0.019 | -0.038 | 0.112 | 0.030 |
| 22 Printing and publishing | 0.044 | | 0.021 | 0.021 | 0.044 | 0.115 | 0.040 | 0.049 | 0.138 | 0.056 |
| 23 Coke, refined petroleum products and nuclear fuel | 0.304 | | 1.186 | 0.649 | 0.194 | 0.249 | 0.259 | 0.155 | | 0.412 |
| 24 Chemical and chemical products | 0.053 | -0.001 | 0.172 | -0.119 | 0.116 | 0.120 | 0.073 | 0.068 | 0.280 | 0.150 |
| 25 Rubber and plastic products | 0.170 | -0.083 | 0.089 | 0.124 | -0.041 | -0.025 | -0.073 | -0.052 | -0.042 | 0.067 |
| 26 Other non-metallic mineral products | 0.125 | 0.136 | 0.107 | -0.076 | 0.005 | 0.016 | -0.056 | -0.021 | 0.061 | 0.066 |
| 27 Basic metals | 0.009 | -0.186 | -0.145 | 0.256 | -0.012 | 0.025 | 0.048 | 0.053 | -0.010 | 0.100 |
| 28 Fabricated metal products | -0.015 | -0.006 | -0.061 | -0.088 | -0.045 | 0.002 | -0.008 | -0.032 | -0.002 | 0.026 |
| 29 Machinery and equipment | -0.091 | -0.201 | -0.081 | -0.076 | -0.008 | 0.030 | 0.000 | 0.010 | 0.046 | 0.041 |
| 30 Office machinery and computers | -0.199 | 0.825 | -0.232 | 0.095 | -0.121 | -0.029 | -0.094 | -0.015 | | -0.074 |
| 31 Electrical machinery and apparatus | -0.040 | 0.004 | 0.087 | -0.090 | -0.027 | -0.019 | -0.097 | 0.037 | 0.043 | 0.013 |
| 32 Radio, television and communication equipment | -0.024 | -0.128 | -0.078 | -0.348 | 0.084 | -0.016 | 0.014 | 0.025 | 0.047 | 0.012 |
| 33 Medical, precision and optical instruments, watches and clocks | -0.162 | -0.101 | 0.153 | 0.011 | -0.042 | -0.009 | -0.129 | 0.059 | -0.151 | -0.025 |
| 34 Motor vehicles, trailers and semi-trailers | 0.248 | 0.030 | -0.014 | 0.612 | 0.007 | -0.009 | -0.021 | -0.039 | 0.093 | 0.055 |
| 35 Other transport equipment | -0.063 | 0.002 | 0.245 | -0.010 | -0.066 | -0.066 | -0.023 | 0.014 | 0.125 | 0.043 |
| 36 Furniture, manufacturing | -0.093 | -0.020 | -0.111 | -0.140 | -0.152 | -0.116 | -0.228 | -0.051 | -0.138 | -0.103 |
| 37 Recycling | -0.146 | -0.037 | -0.024 | -0.281 | -0.085 | -0.061 | -0.225 | 0.028 | 0.152 | 0.119 |
| 40 Electricity, gas, steam and hot water supply | 0.133 | 0.352 | 0.282 | 0.246 | 0.354 | 0.177 | 0.102 | -0.073 | 0.553 | 0.374 |
| 41 Collection, purification and distribution of water | 0.028 | | -0.122 | -0.066 | | 0.137 | 0.150 | | 0.329 | 0.050 |
| 45 Construction | -0.059 | -0.112 | -0.035 | -0.173 | -0.056 | -0.029 | 0.068 | 0.042 | -0.044 | 0.075 |
| 50 Sale, maintenance and repair of motor vehicles and motorcycles | -0.067 | -0.019 | | 0.162 | 0.007 | 0.009 | -0.004 | -0.050 | 0.042 | -0.032 |
| 51 Wholesale trade | 0.091 | 0.066 | 0.171 | 0.056 | 0.008 | 0.035 | 0.019 | 0.003 | 0.050 | -0.014 |
| 52 Retail trade | -0.235 | -0.200 | -0.079 | -0.004 | -0.057 | 0.002 | -0.051 | -0.123 | -0.152 | -0.111 |
| 55 Hotels and restaurants | 0.013 | -0.047 | -0.108 | -0.037 | -0.211 | -0.137 | -0.006 | -0.037 | -0.209 | -0.085 |
| 60 Land transport; transport via pipelines | -0.005 | -0.185 | -0.250 | -0.094 | -0.144 | 0.018 | -0.114 | -0.029 | 0.001 | 0.005 |
| 61 Water transport | | 1.215 | 0.160 | | -0.030 | 0.189 | -0.044 | 0.010 | 0.289 | |
| 62 Air transport | 3.583 | 0.174 | 0.007 | -0.102 | 0.105 | 0.408 | 0.224 | 0.222 | 0.318 | 0.240 |
| 63 Transport activities | 0.276 | 0.349 | 0.205 | 0.364 | -0.021 | 0.020 | 0.092 | -0.011 | 0.432 | 0.011 |
| 64 Post and telecommunications | 0.848 | 1.835 | 0.615 | 0.029 | 0.036 | -0.355 | 0.097 | 0.090 | 0.764 | 0.172 |
| 65 Financial intermediation | 0.245 | 0.758 | 0.584 | 0.085 | 0.075 | 0.378 | 0.312 | -0.060 | 0.649 | 0.368 |
| 66 Insurance and pension funding | 0.308 | 0.054 | 0.366 | 0.479 | 0.093 | 0.209 | 0.172 | -0.061 | 0.498 | 0.040 |
| 67 Activities auxiliary to financial intermediation | 0.771 | 0.131 | 0.154 | 0.086 | 0.025 | 0.091 | 0.419 | 0.298 | 0.596 | 0.153 |
| 70 Real estate activities | 0.025 | 0.081 | 0.170 | 0.413 | -0.022 | 0.010 | 0.161 | 0.028 | 0.087 | 0.035 |
| 71 Renting of machinery | 0.847 | 1.199 | 0.118 | 0.078 | 0.024 | 0.077 | -0.093 | -0.004 | 0.084 | -0.056 |
| 72 Computer and related activities | -0.069 | 0.833 | 0.296 | 0.243 | -0.012 | 0.093 | 0.071 | 0.155 | 0.294 | -0.057 |
| 73 Research and development | -0.135 | -0.122 | -0.048 | 0.389 | -0.034 | 0.015 | 0.104 | -0.082 | 0.390 | -0.104 |
| 74 Other businesses activities | -0.083 | 0.213 | -0.014 | -0.113 | -0.029 | -0.129 | -0.151 | 0.023 | 0.186 | -0.113 |

# Appendix 4: Spearman correlation coefficients between net inter-industry wage differentials

(i.e. controlling for employee, job and employer characteristics, except the level of wage bargaining)

| | CZ | LV | LT | SL | BE | IT | NL | NO | PT | ES |
|---|---|---|---|---|---|---|---|---|---|---|
| **CZ** | 1.000 | | | | | | | | | |
| **LV** | 0.455** | 1.000 | | | | | | | | |
| **LT** | 0.351* | 0.599** | 1.000 | | | | | | | |
| **SL** | 0.529** | 0.485** | 0.615** | 1.000 | | | | | | |
| **BE** | 0.403** | 0.233 | 0.552** | 0.495** | 1.000 | | | | | |
| **IT** | 0.355* | 0.016 | 0.405** | 0.520** | 0.601** | 1.000 | | | | |
| **NL** | 0.478** | 0.267 | 0.590** | 0.594** | 0.621** | 0.591** | 1.000 | | | |
| **NO** | 0.418** | 0.334* | 0.515** | 0.316* | 0.243 | 0.269° | 0.610** | 1.000 | | |
| **PT** | 0.482** | 0.625** | 0.481** | 0.414** | 0.646** | 0.312* | 0.677** | 0.412** | 1.0000 | |
| **ES** | 0.538** | 0.385* | 0.616** | 0.572** | 0.504** | 0.376* | 0.654** | 0.443** | 0.600** | 1.0000 |

**/*/°: Coefficient significant at the 1, 5 and 10 per cent level, respectively.

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