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Regional Wage Differentiation and Wage Bargaining Systems in the EU

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Abstract

The theoretical literature has argued that a centralized wage bargaining system may result in low regional wage differentiation and high regional unemployment differentials. The empirical literature has found that centralized wage bargaining leads to lower wage inequality for different skills, industries and population groups, but has not investigated its impact on regional wage differentiation. Empirical evidence in this paper for EU regions for the period 1980-2000 suggests that countries with more coordinated wage bargaining systems have lower regional wage differentials, after controlling for regional productivity and unemployment differentials.

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I. INTRODUCTION

According to the theoretical literature, a centralized/coordinated wage bargaining system may cause low wage differentiation and high unemployment differentials across different skill levels, population groups, industries and regions. Under such a system, wages across all groups will converge to the market equilibrium for the high productivity group, or will be determined by the medium group. However, though the theoretical predictions are clear, empirical evidence is scant, especially for the effects on regional wage differentiation, with analysis hampered by data limitations at the regional level.

The issue is of particular interest for the EU. Average unemployment is higher in many of the EU countries than in the rest of the industrial world. Some have argued that this is often a regional problem.[2] Indeed, many EU countries have high regional unemployment differentials. The fact that many EU countries have relatively low regional wage differentials suggests that regional wages do not adjust to equilibrate regional labor markets. Italy, for example, has the highest regional unemployment differentiation in the EU, but one of the lowest regional wage differentials.[3] Unemployment in the South is almost four times higher than in the North, and while productivity in the South is estimated to be only 80 percent of that in the North, wages are about 90 percent. Taking into account that the cost of living is lower in the South, real wages in the South may actually be higher than in the North. Italy's centralized wage bargaining system may be one of the reasons for its low wage differentiation across regions, which in part would explain its high regional unemployment imbalances.

This paper argues that, indeed, coordinated wage bargaining systems and low regional wage differentiation are often linked. Empirical evidence for regions in 10 EU countries for the period 1980-2000 suggests that countries with less coordinated wage bargaining systems have higher regional wage differentials after controlling for regional productivity and unemployment differentials. The results are robust to estimation with instrumental variables, suggesting that the causality runs from the wage bargaining system to regional wage differentiation. Moreover, the results turn out to hold only for countries with high regional productivity differentials. Therefore, the empirical evidence suggests that a more flexible wage bargaining system could increase regional wage differentiation, reflecting regional productivity differentials. The paper proceeds as follows: section II discusses the existing relevant literature; section III proceeds with the empirical evidence; and Section IV concludes.

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[2] Pench, Sestito, and Frontini (1999) find that unemployment in Germany, Belgium, and Italy is primarily a regional problem.

[3] See Demekas (1995) and Vamvakidis (2002).

II. WAGE BARGAINING SYSTEM AND REGIONAL WAGE DIFFERENTIATION: WHAT DO WE KNOW FROM THE LITERATURE

The literature on the costs and benefits of various wage bargaining systems has primarily focused on the impact of each system on total unemployment and inflation. Bruno and Sachs (1985) found that centralized wage bargaining systems result in lower unemployment. Calmfors and Driffil (1988), Flanagan, Moene and Wallerstein (1993), and Cukierman and Lippi (1999) found that either centralized or very decentralized (firm level) bargaining systems result in lower unemployment and lower wages—while intermediate systems, with negotiation at the industry level, result in higher unemployment and higher wages. According to this evidence, extremes work better—a centralized bargaining system results in lower wage demands to internalize unemployment externalities, while a decentralized bargaining system results in a similar outcome because of high competition at the firm level. Both factors are absent when negotiations are at the industry level, since industry unions do not internalize the externality of their wage demands to the rest of the economy, and competition is low across different industries. However, this evidence is not robust as the literature reviews in OECD (1997 and 2006), Flanagan (1999) and Aidt and Tzannatos (2002) have shown, and the debate is still open.

It has been argued that centralization/coordination of the wage bargaining process tends to reduce wage dispersion. In a coordinated wage bargaining system, in which wages are negotiated at the national level, unions may tend to favor the median voter. Uncertainty about wages after the negotiating process could result in the compression of wage differentials by unions. Pench, Sestito, and Frontini (1999) present a model with some empirical evidence for EU countries suggesting that in countries with centralized labor markets and large interregional productivity differentials decisions are tailored for the median region, resulting in a wage floor consistent with high unemployment in the less productive regions. Furthermore, unions may prefer a solidaristic wage policy, in which average productivity determines wages.

If a country, in addition to a centralized wage bargaining system, has regional economic asymmetries, then it is in the interest of the union members in the more developed regions to have wages above equilibrium in the less developed regions. Saint-Paul (1997) argued that wages in Italy and Germany are determined in the leading regions, North in Italy and West in Germany, and that the union members in the leading regions have an incentive to keep wage differentiation low to slow down migration flows.[4] Brunello, Lupi, and Ordine (2001) and Vamvakidis (2002) presented evidence for Italy suggesting that the wage in the South, the high unemployment region, is significantly affected by the unemployment rate in the North, the low unemployment region, while the unemployment rate in the South does not have a statistically significant impact.

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[4] Although Decressin and Decressin (2002) found no compelling evidence for wage floors that constrain the adjustment of wages of the less well paid in Germany.

The parties with decision power in a centralized wage bargaining system may prefer a low regional wage differentiation. Workers and employers in the leading regions may not want higher competition from lower wages in the lagging regions, while the employed in the lagging regions prefer high wages. Employers in the leading regions would prefer lower wages in the lagging regions if this would also keep wages in the leading regions down. However, this would require high regional factor mobility, which is not always the case in Europe. The groups who would benefit from higher regional wage differentiation include the group of unemployed in the lagging regions, who do not have much of a bargaining power, and the employers in the lagging regions, who although may participate in the decision process they may be less powerful than the employers in the leading regions.

In a country with a centralized/coordinated wage bargaining system and with wages determined by the leading region, low wage dispersion could coexist with high unemployment variation. A negative economic shock will increase unemployment in the lagging region without affecting wages, while the same shock in the leading region will reduce wages. As a result, the impact of a negative shock on employment will be smaller in the leading region and will not last as long as in the lagging region. If local wages were determined by local economic conditions, then temporary asymmetric economic shocks would not cause permanent regional unemployment disparities.[5] Some empirical evidence are in support of this argument, showing that in a centralized wage bargaining system, negative shocks have a larger impact on poor regions (see Pench, Sestito, and Frontini, 1999). Thomas (2002) finds similar evidence at the industry level.

The empirical literature on wage bargaining systems reviewed in OECD (1997, 2004 and 2006) finds a strong link between higher centralization/coordination of wage bargaining and lower earnings inequality for different skill levels and wage dispersion across different industries, but also across different population groups, such as for young or older workers and women. Furthermore, this seems to be the only robust result of this literature (see Flanagan (1999) Aidt and Tzannatos (2002)).[6] One would expect this result to hold for regional wage disparities as well, but the empirical literature has not addressed this issue so far.

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[5] See Brunello, Lupi and Ordine (2001).

[6] Dell'Aringa and Pagani (2007) find that in countries with relatively centralized wage bargaining systems (Italy, Belgium and Spain) wages of workers covered by only a multi-employer contract are no more compressed than those of workers covered by both multi-employer and single-employer contracts. This implies that where workers are not covered by single-employer bargaining, they receive wage supplements paid unilaterally by their employers.

III. WAGE BARGAINING CENTRALIZATION AND REGIONAL WAGE DIFFERENTIATION IN

THE EU: EMPIRICAL RESULTS

This section provides estimates on the link between the degree of coordination in the wage bargaining system and regional wage differentials in EU countries. As the previous section concluded, the literature has found strong empirical evidence that centralized/coordinated wage bargaining systems lead to low wage inequality across different skills, industries and population groups. The theory suggests that the same result should hold for regional wage differentials.

Most EU countries have relatively high unemployment rates and low labor market participation rates (Table 1). Moreover, they have high regional unemployment variation (Table 2)—with Italy having by far the largest regional unemployment disparities in the EU—considerably more so than the U.S.. Although the regional mix of industries may contribute to this result, OECD (2000) finds a very low correlation between regional unemployment rates and the proportions of employment in agriculture, manufacturing, and services in OECD countries.

The collective bargaining structure is usually assessed based on indices for the level of wage bargaining and the level of coordination among employers and trade unions. A wage bargaining system is characterized as centralized or decentralized, depending on the extent that wages are decided at the national level, or at the firm level respectively—negotiations at the industry (sector) level is the intermediate case. National level bargaining does not necessarily result in a uniform wage, since it often includes negotiations for wages by sector, or region. A wage bargaining system is characterized as coordinated if wage negotiations between unions, employers, and the government are coordinated, either through national bargaining, or through other formal or informal mechanisms when wage negotiations are taking place at the sector, regional, or firm level. The indices in Table 3 from OECD (1997 and 2004) take values from 1 to 5, with 1 for the lowest level of centralization or coordination. Many euro area countries have centralized and highly coordinated collective bargaining systems, and particularly Italy, Austria, Germany, and Norway, as well as high bargaining coverage and trade union density. The overall trend in OECD countries is towards more decentralized wage bargaining systems, although with very reluctant steps (see OECD, 2004 and 2006).

In the analysis that follows, the degree of coordination is chosen as an indicator of the centralization of the wage bargaining system. The literature has argued that even in decentralized wage bargaining systems, the wage outcome will be the same as in centralized bargaining system when there is a high degree of coordination (see Flanagan (1999), OECD (2004), and Nickell, Nunziata, Ochel and Quintini (2003)). Even if wages are determined at the firm or industry level, high coordination between unions, employers' organizations and the government produces the same outcome as in a system of wage bargaining at the national level (OECD, 1997). As noted by Flanagan (1999), "…(the) bargaining level is then the form but not the substance of the bargaining system…empirical work stemming from the bargaining level literature misclassifies (as decentralized) those countries with company-

level negotiations in which bargaining outcomes are in fact highly coordinated across bargaining pairs…" and "given the many ambiguities in measures of bargaining centralization,…measures of bargaining coordination seem preferable to measures of bargaining level."

The sample includes the regions of the following countries: Belgium, Germany, Spain, France, Italy, Netherlands, Austria, Portugal, Sweden and the UK. The choice of the countries in the sample is based on data availability in the Regional Statistics of Eurostat (various issues), which is the source for all data but the index of coordination of the wage bargaining system, which comes from OECD (1997 and 2004).[7] The definition of the regions follows Eurostat. The sample includes 220 regions. The regression is estimated as a pooled panel of five-year averages, with or without fixed region and time effects, but also with random effects in some specifications to test robustness of the results. The estimation period is from 1980 to 2000.

The dependent variable is the difference between the wage in a region and the wage in the whole country of this region, measured as the absolute value of 1 minus the ratio of the wage in a region with the national wage (absolute values are taken because the estimation attempts to find the determinants of regional wage differentials regardless if they are positive or negative). The independent variables include: the lagged regional labor productivity differential compared with the labor productivity in the respective country, the lagged regional unemployment differential compared with the unemployment rate in the respective country (both measured the same way as the regional wage differential), and the OECD index of coordination of the wage bargaining system in each country (this is the same for each region within the same country). The regional productivity and unemployment differentials are included with one lag to address causality concerns.

The results in Table 4 suggest that coordination in wage bargaining and regional wage dispersion seem to be linked. The panel is estimated first as a pool and then with fixed region effects, with random region effects and with fixed region and time effects. The Hausman test implies that the specification should include fixed effects as opposed to random effects. Also, both region and time effects are statistically significant. The estimate of the coordination index is negative and statistically significant at the 10 percent level in the pooled panel regression and at the 1 percent level in the regressions with fixed and random region effects. Although still with the right sign, the estimate is significant only at the 15 percent level in the regression with both fixed region and time effects. Despite the fact that the level of significance is not always high, one could say that according to these results a high level of coordination seems to be linked to low regional wage differentiation. The estimate of the unemployment differential is positive, as would be expected, but not always statistically significant. The estimate of the productivity differential is also positive and statistically significant but in the regression with the fixed region effects, in which, although significant,

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[7] Future research could add Denmark, Norway and Finland in this sample, especially as these are countries with relatively centralized wage bargaining systems, but low regional unemployment variation.

has the wrong sign. The estimation with fixed effects explains 66 percent of the variation in regional wages.

Institutions are often assumed to be exogenous, but labor market institutions do change over time. Although the change of labor market institutions is usually very slow, some causality concerns may be justified. Furthermore, it could be the case that countries without large regional wage differentials adopt a centralized wage bargaining system, rather than the other way around. The estimation with fixed effects addresses the later concern, but the first concern could be addressed only by estimation with instrumental variables.

Results from an estimation with instrumental variables suggest an even stronger link between coordination in wage bargaining and regional wage dispersion. The instruments include the lagged values of the coordination and centralization indices. The estimates of the coordination index in Table 5 are now statistically significant at the 1 percent level, even when both fixed region and time effects are included in the specification.[8]

Results from regressions with interaction terms suggest that the impact of the coordination in wage bargaining on regional wage differentiation depends on productivity differentials but not on unemployment differentials. The results in Table 6 show that the estimate of the coordination index remains positive and statistically significant at least at the 10 percent level when an interaction term with unemployment differentials is included. In contrast, the interaction term has the wrong sign and is statistically insignificant. However, when an interaction term with the productivity differentials is included, the estimate of the coordination index loses its significance. In contrast, the interaction term is negative and statistically insignificant at least at the 10 percent level. This suggests that in countries with large regional productivity differentials, regional wages reflect these differential to a smaller extent than otherwise if the wage bargaining system is coordinated. In countries with no regional productivity differentials, which also suggests that wage differentials linked to productivity are small, the wage bargaining system does not seem to matter.

Using Italy as an example—the country with the highest regional unemployment disparities in the sample, the second lowest regional wage variation in the euro area, and a centralized and coordinated wage bargaining system—the results imply that regional wage differentials are likely to increase if a more decentralized wage bargaining system were adopted. If Italy's coordination index were to decline from its current value of 4 to 1, which is the minimum value of the index, regional wage differences would increase by between 52 percent to 60 percent, depending on the specification, keeping everything else constant.

IV. CONCLUSIONS

The theoretical literature has argued that a centralized/coordinated wage bargaining system may cause low regional wage differentiation and high regional unemployment differentials.

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[8] Since the Hausman tests supports the estimation with fixed effects, what follows does not report results for the estimation with random effects.

Empirical evidence in this paper for EU regions for the period 1980-2000 suggests that, indeed, highly coordinated wage bargaining systems and low regional wage differentiation are linked: countries with less coordinated wage bargaining systems have higher regional wage differentials after controlling for regional productivity and unemployment differentials. The results are robust to fixed effects estimation and to estimation with instrumental variables, suggesting that it is the wage bargaining system that influences regional wage differentiation rather than the other way around. The empirical evidence suggests that a more decentralized wage bargaining system could increase regional wage differentiation, particularly in countries with high regional productivity differentials. Using the case of Italy as an example, the economic significance of the results is shown to be large.

The results should be treated as only suggestive, since the sample of countries is small and with a relatively small variation in their wage bargaining characteristics (most countries in Europe have relatively centralized and coordinated wage bargaining systems). Furthermore, the statistical significance of the results is relatively low in some specifications, although this is not the case in the estimation with instrumental variables. The work on wage bargaining indices is still in progress and existing indices may suffer from measurement errors. To further investigate the robustness of these results, it would be useful for future work to increase the country sample as more data become available, to improve the indices of wage bargaining, and to investigate the role of other determinants of regional wage differentials in addition to the ones controlled for in this paper.

Table 1. Unemployment and Participation Rates in Selected
OECD Countries: 1980–2007

	1980	1990	2000	2007	1980	1990	2000	2007
	Unemployment Rate				Participation Rate			
Euro area	4.9	7.2	7.9	6.8	65.1	65.7	69.1	71.9
Australia	6.1	6.6	6.3	4.3	70.6	74.4	75.1	77.8
Austria	1.4	4.1	4.6	5.3	79.9	78.1	79.7	79.1
Belgium	6.7	6.6	6.9	7.7	63.7	62.9	66.1	68.0
Canada	7.5	8.2	6.8	6.0	72.6	77.7	77.2	79.9
Germany	1.7	4.5	6.9	6.4	68.3	72.4	75.2	77.8
Denmark	5.2	7.2	4.3	3.5	80.7	82.3	81.1	83.0
Finland	4.6	4.6	9.8	6.6	75.2	76.7	74.5	75.4
France	5.6	7.7	8.1	8.0	67.2	65.0	68.3	68.5
Greece	2.8	7.0	11.7	8.6	56.9	60.2	63.0	65.6
Ireland	7.5	13.1	4.3	4.8	63.5	63.4	69.7	74.3
Italy	5.6	9.1	10.2	5.9	61.3	60.0	60.0	63.1
Netherlands	3.9	5.7	3.0	3.3	66.5	68.8	77.4	79.8
Norway	1.7	5.2	3.4	2.5	75.3	78.0	80.7	80.5
Portugal	8.3	4.8	4.0	7.9	68.9	72.1	75.1	78.2
Spain	9.3	12.1	10.8	8.1	58.7	59.0	64.9	73.2
Sweden	2.0	1.6	4.7	4.6	81.5	84.5	77.8	79.5
Switzerland	0.2	0.5	2.5	3.3	77.8	86.6	86.6	88.2
United Kingdom	6.8	7.1	5.5	5.5	74.6	77.4	75.7	76.2
United States	7.2	5.6	4.0	4.6	63.8	66.5	67.1	66.1

Source: OECD, Economic Outlook.

Table 2. EU, Unemployment Rate
(Regional Coefficient of Variation)

	1990	1995	2000
EU	65.5	60.1	65.9
Belgium	43.8	41.1	57.8
Denmark	22.2	28.2	22.5
Germany	43.7	33.1	47.7
Greece	27.4	24.3	17.3
Spain	36.0	28.4	44.0
France	24.8	22.3	29.4
Ireland	12.9	11.8	23.2
Italy	70.8	63.9	75.3
Netherlands	26.9	19.3	33.2
Austria	...	36.0	33.8
Portugal	50.6	30.3	32.5
Finland	51.7	16.0	34.7
Sweden	41.1	17.8	31.8
United Kingdom	47.1	35.8	53.0
United States	25.5 (1993)	27.0	27.5

Source: Eurostat and U.S. Department of Labor.

Table 3. Collective Bargaining Characteristics of Selected OECD Countries, 1980–2000

	1980	1990	2000	1980	1990	2000	1980-84	1985-89	1990-94	1995-2000	1980-84	1985-89	1990-94	1995-2000
	Bargaining coverage			Trade Union Density			Centralization				Coordination			
Australia	80	80	80	48.0	40.0	25.0	4.0	4.0	2.0	2.0	4.5	4.0	2.0	2.0
Austria	95	95	95	57.0	47.0	37.0	3.0	3.0	3.0	3.0	4.5	4.0	4.0	4.0
Belgium	90	90	90	54.0	54.0	56.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.5
Canada	37	38	32	35.0	33.0	28.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Denmark	70	70	80	79.0	75.0	74.0	3.0	3.0	3.0	2.0	3.0	4.0	3.0	4.0
Finland	90	90	90	69.0	72.0	76.0	4.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0
France	80	90	90	18.0	10.0	10.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Germany	80	80	68	35.0	31.0	25.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0
Italy	80	80	80	50.0	39.0	35.0	3.5	2.0	2.0	2.0	3.5	2.0	3.0	4.0
Japan	25	20	15	31.0	25.0	22.0	1.0	1.0	1.0	1.0	4.0	4.0	4.0	4.0
Netherlands	70	70	80	35.0	25.0	23.0	3.0	3.0	3.0	3.0	4.5	4.0	4.0	4.0
New Zealand	60	60	25	69.0	51.0	23.0	3.0	3.0	1.0	1.0	4.0	4.0	1.0	1.0
Norway	70	70	70	58.0	59.0	54.0	3.5	4.5	4.5	4.5	3.5	4.5	4.5	4.5
Portugal	70	70	80	61.0	32.0	24.0	3.0	3.0	4.0	4.0	3.0	3.0	4.0	4.0
Spain	60	70	80	7.0	11.0	15.0	4.0	3.5	3.0	3.0	4.0	3.5	3.0	3.0
Sweden	80	80	90	80.0	80.0	79.0	4.5	3.0	3.0	3.0	3.5	3.0	3.0	3.0
Switzerland	50	50	40	31.0	24.0	18.0	3.0	3.0	2.0	2.0	4.0	4.0	4.0	4.0
United Kingdom	70	40	30	51.0	39.0	31.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
United States	26	18	14	22.0	15.0	13.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Source: OECD (1997 and 2004).

Table 4. Regional Wage Differentiation and Wage Bargaining in the EU, 1980–2000

	Pooled	Fixed region effects	Random effects	Fixed region and time effects
Constant	0.107*** (5.044)		0.126*** (6.344)	
Lagged unemployment differential	0.002 (0.092)	0.109*** (2.952)	0.032 (1.574)	0.090** (2.391)
Lagged productivity differential	0.472*** (8.346)	-0.394*** (-3.425)	0.306*** (5.440)	-0.326*** (2.894)
Index of coordination in wage bargaining	-0.012* (-1.834)	-0.026*** (-2.905)	-0.016*** (-2.601)	-0.014 (-1.465)
Adj. R-squared	0.25	0.63	0.11	0.66
Observations	220	220	220	220

Note: The sample includes 220 regions from the following countries: Belgium, Germany, Spain, France, Italy, Netherlands, Austria, Portugal, Sweden and the UK. The definition of the regions follows Eurostat. The data are five-year averages for the period 1980 to 2000. The dependent variable is the difference between the wage in a region and the wage in the whole country of this region, measured as the absolute value of 1 minus the ratio of the wage in a region with the national wage.

Table 5. Regional Wage Differentiation and Wage Bargaining in the EU,
Estimation with Instrumental Variables, 1980-2000

	Fixed region effects	Fixed region and time effects
Lagged unemployment differential	0.130*** (3.435)	0.108*** (2.795)
Lagged productivity differential	-0.380*** (-3.245)	-0.332*** (-2.898)
Index of coordination in wage bargaining	-0.044*** (-4.193)	-0.032*** (-2.967)
Adj. R-squared	0.62	0.65
Observations	220	220

Note: The sample includes 220 regions from the following countries: Belgium, Germany, Spain, France, Italy, Netherlands, Austria, Portugal, Sweden and the UK. The definition of the regions follows Eurostat. The data are five-year averages for the period 1980 to 2000. The dependent variable is the difference between the wage in a region and the wage in the whole country of this region, measured as the absolute value of 1 minus the ratio of the wage in a region with the national wage. The instruments include the lagged values of the coordination and centralization indices.

Table 6. Regional Wage Differentiation and Wage Bargaining in the EU,
Estimation with Interaction Terms, 1980-2000

	Fixed region effects	Fixed region and time effects	Fixed region effects	Fixed region and time effects
Lagged unemployment differential	0.021 (0.228)	-0.015 (-0.171)	0.116*** (3.179)	0.097** (2.580)
Lagged productivity differential	-0.387*** (-3.358)	-0.316*** (-2.806)	0.419 (1.018)	0.327 (0.821)
Index of coordination in wage bargaining	-0.036*** (-2.758)	-0.026* (-1.970)	-0.003 (-0.180)	0.004 (0.298)
Index of coordination in wage bargaining * Lagged unemployment differential	0.028 (1.057)	0.033 (1.312)		
Index of coordination in wage bargaining * Productivity differential			-0.218** (-2.055)	-0.177* (-1.708)
Adj. R-squared	0.63	0.66	0.64	0.67
Observations	220	220	220	220

  Note: The sample includes 220 regions from the following countries: Belgium, Germany, Spain, France, Italy, Netherlands, Austria, Portugal, Sweden and the UK. The definition of the regions follows Eurostat. The data are five-year averages for the period 1980 to 2000. The dependent variable is the difference between the wage in a region and the wage in the whole country of this region, measured as the absolute value of 1 minus the ratio of the wage in a region with the national wage.

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