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National and Sectoral Influences on Wage Determination in Central and Eastern Europe

ABSTRACT ▪ The article investigates wage determination in Slovenia, Slovakia, Hungary, Poland, the Czech Republic and Lithuania. In particular, what is the relative influence of national and sectoral factors? While industrial relations in these countries are still in the process of change, different national patterns have emerged; what is their significance for wage determination? The literature on Western economies is unanimous that coordination of wage bargaining reduces wage dispersion, but disagrees on its effects on unemployment and inflation. The article provides a panel analysis for manufacturing sectors, examining average wages in the total economy and sectoral productivity. The openness of the economy, capital intensity and skill are also discussed. The results are compared with the recent index of the collective bargaining coordination by Visser and with cross-country data on union density.
KEYWORDS: Central and Eastern Europe ▪ collective bargaining ▪ FDI wage dispersion ▪ industrial relations ▪ wage determination

Real labour markets rarely function like the spot markets that dominate introductory microeconomic textbooks. In most developed countries, wages are bargained between unions and employers or employer organizations. However, bargaining can take place at the firm level, as in many Anglo-Saxon countries, or in a coordinated fashion at the sectoral or national level, as in much of Western Europe, with various intermediate forms existing. In the Central and Eastern European countries (CEECs) industrial relations institutions have only recently emerged. Since the breakdown of Communism, industrial relations have been shaped by large-scale privatization, large inflows of foreign direct investment (FDI) and the requirements of EU accession (Aguilera and Dabu, 2005), involving the modernization of labour law, including the right of workers to form unions and to bargain collectively (Schroeder, 2004).

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While most CEECs have firm-level bargaining structures, there are significant variations between countries. Slovenia has highly organized industrial relations that resemble Scandinavian or Austrian patterns, with collective bargaining coverage close to 100 percent, whereas in Lithuania only 14 percent of employees are covered – and indication of disorganized industrial relations. Our other countries are intermediate cases with weakly organized industrial relations.

What are the effects of different bargaining regimes on economic outcomes? For Western economies there is a rich literature on this topic (EC, 2003; OECD, 2004). The liberal hypothesis predicts a linear increase in performance with respect to unemployment and inflation with the degree of disorganization (market-orientedness) of industrial relations; conversely, the corporatist hypothesis is that the degree of organization has a positive effect (Traxler et al., 2001). As an intermediate position, Calmfors and Driffill (1988) developed the hump-shaped hypothesis: intermediate bargaining structures will deliver worse outcomes than consistently organized or disorganized industrial relations. What is common to these hypotheses that the degree of organization has a negative effect on *wage dispersion*. This assertion has received wide empirical support for Western countries (OECD, 2004), but has not been investigated for CEECs. This is the focus of this article.

CEECs have a different historical and thus institutional background from Western countries. Whether labour market institutions that seem to resemble those in Western economies have the same economic effects is an open question: it may be misleading to generalize from Western experience to the east. Ost (2002: 33) warns that 'much recent theory is based on capitalist experiences that are inappropriate for understanding post-communism'.

We investigate the determination of manufacturing wages in six CEECs: Slovenia, Slovakia, Hungary, Poland, the Czech Republic and Lithuania. In particular, we examine the relative role of national and sectoral influences, using average wages in the total economy and sectoral productivity serve as proxies. Wage determination is analyzed by means of a panel analysis of manufacturing sectors. In addition trade openness and the size of FDI stocks serve as control variables. We allow for differences in wage movements across sectors according to capital intensity and skill groupings. The results across countries are compared with the recent classification of industrial relations by Kohl and Platzer (2004) and Visser (2009).

The English-language literature on CEECs during and after transition has had a strong focus on growth. Only recently have issues of wage determination gained more interest, often linked to the issue of relocation and its effects. Here two lines of research have emerged. First, analysis of relocation to Eastern economies has highlighted the issue of

wage disparities according to skills. Egger and Stehrer (2003) find that intermediate exports and imports have a positive effect on the unskilled wage share in the Czech Republic, Hungary and Poland based on dynamic panel estimations on the two-digit level. Second, research has examined regional wage disparities. Egger et al. (2005) conclude that trade liberalization has fostered regional divergence rather than convergence. Iara and Traistaru (2004) find that wages are responsive to regional unemployment in Hungary, Poland and Bulgaria, but not in Romania. Their study is based on a panel analysis with regional (monthly) wage and (annual) unemployment data.

The next section of this article provides the theoretical background, after which we discuss industrial relations in the CEECs and differences between countries. Next we present the data and some stylized facts, followed by the regression results. Particular attention is paid to issues of robustness and to sectoral characteristics in terms of outward orientation and skill content. Finally we discuss possible interpretations of the results.

Theoretical Background

It is generally accepted that highly organized industrial relations give rise to wage compression, or, more positively put, lower inequality among wage earners. The OECD finds a 'robust relationship between the organisation of collective bargaining and labour market outcomes, . . . overall earnings dispersion tends to fall as union density and bargaining coverage and centralization/co-ordination increase' (2004: 166). This will be called the *linear wage compression hypothesis*, that is that more organized industrial relations lead in a linear way to wage compression and thus to a dominance of national factors in wage-setting.

While there has been little disagreement over the effect of bargaining organization on wage dispersion, there has been a broad and controversial debate on the *macroeconomic* effects of wage bargaining systems. This warrants a brief digression. Wage compression has been held responsible, among other factors, for the rise in unemployment in Europe (Blau and Kahn, 2002; Siebert, 1997), though the evidence is inconclusive (Howell and Huebler, 2005). In summarizing the literature on industrial relations and macroeconomic performance, Traxler et al. (2001) distinguish between neoliberal, neoclassical, corporatist and hump-shaped hypotheses. These refer to the outcome in terms of unemployment (or inflation). The neoliberal argument holds that economic performance will deteriorate with the degree of organization of bargaining. The neoclassical argument holds that bargaining (at least in the long run) does not matter, while the corporatist argument claims that

organized bargaining systems are superior to disorganized ones. The last argument is that the degree of organization of industrial relations will have U-shaped effects on macroeconomic outcomes. This view gained prominence through the seminal paper of Calmfors and Driffill (1988), who (referring to unemployment) argued that highly centralized as well as highly decentralized bargaining systems may lead to desirable outcomes. Remarkably their paper provided little evidence for the supposed channel, which is wage moderation.

After two decades of debate, it is fair to say that the evidence remains inconclusive. While OECD (2004) fails to find much of a correlation between bargaining structures and macroeconomic performance, Calmfors et al. (2001) conclude that coordinated bargaining is superior to other forms. A recent OECD report (2006) again asserts that both highly organized welfare regimes and very market-oriented regimes can generate low unemployment.

These debates deal with the effects of industrial relations on employment performance. What will be investigated in this article is the relation between the institutional setting of wage bargaining and the relative strength of sectoral and national factors in wage determination. This is an analytical step prior to analysing the macroeconomic effects of industrial relations. Indeed, much of the debate summarized above *presupposes* that organized industrial relations give rise to a dominance of national factors in wage setting. However, can we take for granted that this is the case in CEECs? The questions to be investigated are therefore: are wages mostly influenced by sectoral or by national factors? Does the nature of industrial relations affect the relative strength of these factors? In this article, average wages in the total economy will serve as the key national variable and sectoral productivity serves as the sectoral factor.

At first sight it may appear that the *linear wage compression hypothesis* is straightforward: coordinated trade unions will demand higher wages in parallel, thus there is no reason to expect wage drift. However, it is less clear than is usually assumed that sectoral wages will diverge in a competitive setting. Indeed, in perfectly competitive labour markets, wages (for a given skill level) would be uniform across all sectors. Supply-side shocks would be reflected in employment changes rather then in wage changes. Why then is it widely expected that wage differentials are wider in a decentralized setting? What is supposedly driving the increasing wage spread in Anglo-Saxon countries is skill-biased technological change, which is reinforced by globalization. However, this crucial role of technology shocks is often not made clear in the literature (e.g. OECD, 2004).

Leaving aside technological shocks, one would expect competitive markets to deliver results *similar* to organized labour markets: a relatively uniform wage rate and consequently a minor effect of sectoral factors.[1]

Only in intermediate cases with strong sectoral trade unions, which are able to gain parts of the rents (at the firm or sectoral level), would one expect a strong effect of sectoral factors in wage determination. This hypothesis will be called the *U-shaped effect of industrial relations*. Note that this hypothesis, while inspired by analyses such as Calmfors and Driffill (1988), is not the argument advanced by them. Their argument refers to macroeconomic outcomes, not to wage dispersion. According to our hypothesis, both highly organized and disorganized bargaining will generate the same outcome, that is, a relatively uniform wage rate across sectors, but for different reasons. In the case of highly organized industrial relations, wage-setting is coordinated intentionally, whereas in the case of disorganized industrial relations labour mobility will ensure that a uniform national wage prevails.

While in theory a very competitive labour market can in the absence of strong sectoral and productivity shocks generate an equal wage distribution, this case should be of limited practical relevance here. The CEECs have experienced strong sectoral shifts and changes in production technologies partly related to FDI inflows, changes in their export markets and a tertiarization of the economy. Technology (and sectoral) shocks have thus been much stronger than in western countries over the same period. Consequently one would expect a widening of wage dispersion in a competitive setting.

Industrial Relations in CEECs

The economies and societies of the CEECs experienced dramatic changes in the late 1980s and 1990s. The transition from a planned economy with state ownership to a capitalist market economy also necessitated new procedures to set wages. This transition was painful for most countries, with a deep recession in the early 1990s. Most countries regained the per capita GDP of 1989 only by the late 1990s. Among the countries discussed here Poland, with a comparatively low starting point, had the most continuous, if moderate, growth path, and the Baltic states (including Lithuania) had a particularly painful recession and lost substantial ground compared to the Central European transition economies.

At the beginning of transition, not even the actors for wage negotiations were present. With the exception of Poland, none of these countries had independent unions, nor were employers organized in associations. Aguilera and Dabu (2005) identify privatization, foreign direct investment and EU accession as key forces that have shaped the transdetermination of industrial relations. Generally, the state took an active role in establishing industrial relations as labour policies were guided by the countries' desire to join the EU. This implied the adoption of modern labour laws,

including the right of workers to form unions and to bargain collectively. While former official unions had possessed strong membership, if little practical influence, numbers declined dramatically. The early transition period also witnessed the foundation of independent unions and conflict between old and new unions (Schroeder, 2004). Strong rivalry persists in Poland and Hungary, while other countries typically have one dominant union federation and several smaller ones.

Kohl and Platzer (2007) speak of a distinct *transitional model of industrial relations*. Other authors (Funk and Lesch, 2004; Pollert, 2000), while not using this label, seem agree with its broad characteristics: 'The private sector is characterized by extensive "union-free" spheres' (Kohl and Platzer, 2007: 618) and 'in multinational companies the labour force is largely non-unionised' (Aguilera and Dabur, 2005: 33). Employers' associations have low membership rates (Carley, 2002); as a consequence, bargaining coverage is low. The state typically plays a much greater role than in most Western countries. Kohl and Platzer (2007) argue that minimum wage increases serve as benchmark for wage contracts but do not substantiate this claim by evidence. In addition, states often encouraged tripartite meetings, which among other things are involved in setting minimum wages.

While there is a substantial literature on industrial relations in CEECs, case studies of trade unions are rare (Gennard, 2007; Myant and Smith, 1999; and Pollert, 1999 are exceptions). Gennard compares the strategies of print unions in the Czech Republic, Hungary and Slovakia and reports that unions in all three countries 'consider an adversarial bargaining strategy . . . unrealistic: they cannot apply effective sanctions during negotiations' (2007: 96). Tellingly, a Czech union president writes: 'the collective bargaining process . . . was successful and worked well . . . and generally respected the principle of maintaining the real wage' (Stasek, 2005: 588); in other words, unions did not even aim at a productivity-oriented wage policy.

Overall, industrial relations are still in a process of flux, but significant differences between countries have emerged: indicative data are summarized in Table 1. Most countries have firm-level wage negotiations; only in Slovenia and Slovakia are there sectoral or national dimensions. This means that substantial parts of the economy are not covered by any agreements: with the exception of Slovenia, only a minority of workers, in most countries around 40 percent, is now covered. Lithuania has the lowest share at 14 percent. Union density varies substantially, being highest in Slovenia (at 41 percent) and Slovakia (30 percent), the other countries ranging between 15 and 25 percent. Finally, the table also reports the level of the minimum wage as percentage of average income, since this has been an important means of state policy to influence wages.

TABLE 1. Indicators of National Industrial Relations

	Dominant level of bargaining[a]	Union density	CB coverage	Summary index of coordination	Effective coordination[b]	Minimum wage as % of average income
Year	2003	2003	2003	2003		2001
Slovenia	NS	41.3	100	0.38	38.3	52
Slovakia	SF	29.9	40	0.51	20.3	41
Czech Republic[c]	F	22.3	44	0.38	16.6	33
Poland	F	19.2	40	0.29	11.7	38
Hungary	F	18.5	35	0.24	8.6	40
Lithuania	F	16.8	14	0.31	4.4	42

[a] N = national, S = sectoral, F = firm.
[b] coordination x coverage
[c] data for 2004.
Sources: Visser (2009); except for minimum wages: Schroeder (2004); effective coordination: own calculation.

In terms of the coordination of wage bargaining,[2] Slovenia is a clear outlier, with highly organized industrial relations similar to Austria or the Scandinavian countries; Slovakia ranks second, with some sectoral elements in bargaining. Hungary, Poland and the Czech Republic represent intermediate cases with industrial relations that are comparable to the British. The ranking between these three countries is not clear cut. Clearly, Lithuania has the most market-oriented industrial relations.

Kohl and Platzer (2004) emphasize that industrial relations are still in process of unfinished determination. Referring to company-level workers' representation wage bargaining they tentatively suggest grouping the countries into northern and southern CEECs. The latter group (Slovenia, Slovakia and Hungary) have affinities with Germanic industrial relations, whereas the former (Czech Republic, Poland and Lithuania) are closer to disorganized Anglo-Saxon industrial relations.

Such rankings have to be interpreted with caution. The most reliable data refer only to the end of our period. And qualitative research on industrial relations fails to find evidence for strong differences among these countries (Pollert, 2000).

Data and Stylized Facts

The effects of national and sectoral factors in wage determination will be investigated by means of sectoral panel regression within each country. The main database is the Vienna Institute for International Economic Studies (WIIW) Industrial Database, which provides one-digit level sectoral data (ISIC Rev. 3, 14 sectors). Our sample covers only manufacturing, which is the only sector with reliable and long time series data for wages and productivity at detailed sectoral classification.

The six countries under investigation are the only CEECs for which continuous time series data are available, that is the Czech Republic, Hungary, Poland, Slovakia, Slovenia, and Lithuania. The other two Baltic countries, Estonia and Latvia, could not be included because of data problems. To check robustness some estimations are replicated on the two-digit level (23 sectors); however these data are only available for Slovenia, Hungary, Poland and Lithuania.

Data problems plague quantitative research on CEECs. Unfortunately for Lithuania no wage data for sector 23 (coke, refined petroleum products, nuclear fuel) are available and sector 16 (tobacco products) is missing. While the latter is a minor problem, the former sector has a strong effect in several countries, since it usually is the highest-paying manufacturing sector. Thus, all relevant regressions will be reported in two forms: first with the full sample. This version is preferable for the comparison between Slovenia, Slovakia, Hungary, Poland and the

Czech Republic, but is not comparable between Lithuania and the other countries. A second reduced sample, excluding sectors 23 and 16 (15 and 16 at the one-digit level) will be reported to allow comparisons between Lithuania and the other economies.

All countries display a rising trend in manufacturing wage dispersion, but with strong differences in its size. Tables 2–5 summarize the variation coefficients, that is, the standard deviation over the mean, for the real wage level (deflated by the consumer price index or CPI). The first measure of wage disparity, the full measure of variation coefficients including all available sectors (Table 2), is only comparable between Slovenia, Slovakia, Hungary, Poland and the Czech Republic, not with Lithuania. According to this measure Slovenia (23.1 in 2004) and the Czech Republic (22.7) have the lowest wage disparities. Slovakia (37.5) and Poland (36.8) have intermediate levels and Hungary (50.6) has substantially higher levels. In all countries, wage disparity increased steadily, and in Slovakia and Hungary this increase accelerated from 2000.

A second measure excludes sectors 15–16 and 23 and is therefore comparable also with Lithuania, while the first measure is clearly preferable for comparisons within the other countries. This is summarized in Table 2. In 2000 the Czech Republic had the lowest level of disparity (18.3), followed by Slovakia (20.6) and Slovenia (22.9). Hungary has the highest level (30.3). Lithuania (25.9) and Poland (24.2) have intermediate levels. Thus the results are similar between the two measures but not identical. Slovenia, Slovakia and the Czech Republic are characterized by low disparities, Poland and Lithuania by intermediate levels and Hungary has high levels of wage disparity. Data at the two-digit levels, available only for four countries, confirm this finding.[3]

TABLE 2. Wage Spread and Wage Increases in CEECs

Coefficients of variation of real wages, one-digit sectors
(in parentheses: without sectors 15–16 and 23)

	Slovenia		Slovakia		Hungary	
1995	22.9%	*(20.5%)*	24.7%	*(18.3%)*	33.9%	*(24.9%)*
2000	21.0%	*(22.9%)*	25.1%	*(20.6%)*	41.1%	*(30.3%)*
2004	23.1%	*(25.0%)*	37.5%	*(22.2%)*	50.6%	*(30.1%)*
	Poland		Czech Republic		Lithuania[a]	
1995	33.0%	*(18.9%)*	15.50%	*(14.1%)*	–	*(25.4%)*
2000	33.4%	*(24.2%)*	21.56%	*(18.3%)*	–	*(25.9%)*
2004	36.8%	*(26.2%)*	22.68%	*(18.3%)*	–	–

[a] Series ends in 2001 and does not cover sector 23 and sector 16.

TABLE 3. Compound Annual Change in Real Wages and Productivity in Manufacturing (1995–2004), GDP per capita and Gini coefficient of household income distribution

	Slovenia	Slovakia	Hungary	Poland	Czech Rep.	Lithuania[a]
Labour productivity	3.4%	8.3%	10.4%	10.0%	7.2%	8.9%
Real wage	2.8%	2.5%	3.8%	2.7%	4.1%	4.7%
GDP 2000 ($PPP)	16,340	10,690	11,900	10,200	14,590	8,654
Gini coefficient[b]	0.25	0.24	0.29	0.31	0.26	

[a] Series ends in 2001.

[b] Source: Luxembourg Incomes Study; 1999 except for Czech Republic (1996).

Wage growth (in manufacturing) has clearly lagged behind productivity growth in all countries (Table 5). Productivity (in manufacturing) grew dramatically since 1995, with compound annual growth rates ranging from 3.4 percent (Slovenia) to 10.4 percent (Hungary). However, it must be kept in mind that these rates exclude the painful transition crisis. Wages grew at a much more modest rate of 2.5 percent (Slovenia) to 4.7 percent (Lithuania, 1995–2001), resulting in a substantial decline in the wage share (in manufacturing) in all CEECs. In 2000, the middle of our period of observation, Slovenia and the Czech Republic had the highest per capita GDP, Slovakia, Hungary and Poland medium levels and Lithuania had the lowest.

The fact that our analysis is based on manufacturing industries has important implications that have to be kept in mind when interpreting the results. First, manufacturing may not be representative for the overall economy. For the period and countries under investigation, the share of manufacturing employment in total employment declined substantially, while employment in services rose correspondingly. Services (like manufacturing) include both well-paid and poorly paid jobs. Table 3 thus also reports the Gini coefficient (for household income) for the year 1999 for the countries available. This gives a similar picture across countries as our measures for the manufacturing wage spread: Slovenia, Slovakia and the Czech Republic have a more equal distribution than Hungary and Poland. Second, productivity growth in manufacturing is substantially higher than in the total economy. If wage growth in manufacturing were linked to economy-wide productivity growth (as in most western countries) rather than sectoral productivity growth, then one would expect manufacturing wage growth lagging behind manufacturing productivity growth.

Regression Results

The stylized facts on wage dispersion are suggestive, but they cannot take into account the shocks that affect sectoral wages. Therefore we turn to regression analysis. Here sectoral shocks, such as technology shocks, will be reflected by sectoral labour productivity. The effect of average wage trends in the total economy, which also include services, are used as to gauge the effective coordination of bargaining.[4]

The regression to be estimated takes the form:

$$\log(w_{jt}) = b_1 \log(x_{jt}) + b_2 \log(wt_t) + b_3 C_{jt} + a_j + \varepsilon_t$$

where w, x and wt are the sectoral real wage (deflated by the CPI), sectoral output per employee[5] and total average wages respectively.[6] C stands for other (sectoral) control variables that will be added in further

specifications. Subscripts *j* refers to sectors and subscripts *t* to time. All specifications are estimated with sectoral fixed effects (*aj*) and standard errors that are robust to serial correlation and cross section heteroscedasticity. Because of the limited number of observations dynamic panel methods are not advisable. However, the results to be presented are roughly consistent with analogue specifications in difference form. The inclusion of the national wage conflicts with the inclusion of fixed time effects, which thus could not be included.

The *linear wage compression hypothesis* would expect a low (high) value for b_1 and a high (low) value for b_2 if the country's industrial relations are highly (weakly) organized and coordinated. In other words, we expect strong national effects, but weak sectoral effects in coordinated labour markets. The *U-shaped effects of industrial relations hypothesis* would expect low values for b_1 and high values for b_2 for highly organized/coordinated *and* disorganized industrial relations, but a high b_1 and a low b_2 for intermediate levels of organization in industrial relations, with low degree of coordination. According to this hypothesis, both highly organized and disorganized will generate the same outcome, that is, strong national effects and low sectoral effects. The mechanisms that ensure the uniform national wage, however, differ. In the case of highly organized industrial relations, wage setting is coordinated intentionally, whereas in the case of disorganized industrial relations labour mobility ensures that a uniform national wage prevails.

Again two sets of results are reported (Table 4), one with all sectors and one with a reduced set of sectors to allow comparability with Lithuania. The ordering of coefficients with respect to the national wage is the same in both variants. Slovenia and the Czech Republic both have values of 0.9 or higher for the full sample of sectors, and have the highest value in the reduced sample (1 and 0.86 respectively). Slovakia (0.69 in Table 4), Hungary (0.66) and Lithuania (0.65) have intermediate values around 0.66 in the reduced sample. Poland has substantially lower values in both specifications (0.4 in 3.2). The effect of sectoral productivity on wages is consistently weak and is statistically insignificant in the Czech Republic. The value is highest in Lithuania (0.22 in Table 4), followed by Slovakia (0.16) and Hungary (0.11). In Poland (0.1) and Slovenia (0.09) it is close to 0.1.

The results at the two-digit level (not available for the Czech Republic and Slovakia) are similar to the one-digit level.[7] Both Slovenia and Lithuania have coefficients for total (average) wages close to unity, while both Hungary and Poland have substantially lower values. The effect of sectoral productivity is again consistently small though statistically significant. Slovenia and Hungary have the lowest values (both 0.06), Lithuania has a medium-small value of 0.11, whereas Poland has the highest value of 0.19. The results in the two-digit estimations are thus

TABLE 4. Sectoral Wage Regressions

Regression results for all one-digit sectors (in parentheses without sectors 15, 16 and 23)

	Slovenia		Slovakia		Hungary	
X	0.104	(0.086)	0.178	(0.158)	0.121	(0.113)
t	9.701	(8.411)	6.719	(7.949)	2.939	(3.414)
WT	0.913	(0.999)	0.709	(0.686)	0.714	(0.663)
t	40.874	(32.062)	9.470	(7.813)	10.120	(12.617)
sectoral FE	yes	(yes)	yes	(yes)	yes	(yes)
MDV	11.892	(11.864)	9.316	(9.277)	11.277	(11.214)
R^2	0.984	(0.990)	0.971	(0.981)	0.985	(0.988)
Obs	140	(120)	140	(120)	140	(120)
Sample	1995:2004	(1995:2004)	1995:2004	(1995:2004)	1995:2004	(1995:2004)
sectors	14	(12)	14	(12)	14	(12)
	Poland		Czech Republic		Lithuania	
X	0.062	(0.097)	0.024	(0.021)	–	(0.226)
t	1.709	(2.802)	1.098	(0.997)	–	(5.637)
WT	0.515	(0.400)	0.901	(0.863)	–	(0.648)
t	4.442	(2.662)	12.033	(13.435)	–	(8.992)
sectoral FE	yes	(yes)	yes	(yes)	–	(yes)
MDV	7.378	(7.331)	9.424	(9.397)		(6.723)
R^2	0.986	(0.980)	0.976	(0.983)		(0.957)
Obs	140	(120)	140	(120)		(84)
Sample	1995:2004	(1995:2004)	1995:2004	(1995:2004)		(1995:2001)
sectors	14	(12)	14	(12)		(12

similar for Slovenia, Hungary, and Poland, but somewhat different for Lithuania, which now has a higher value for the effect of total wages. (It has to be kept in mind that Lithuania has a smaller sample since data are only available until 2001.) Poland's role as an outlier is confirmed.

All of the countries in our sample belong to the group of what King and Szelényi (2005) called 'capitalism from without'-transition countries. By this term they signify that in the transition to capitalism in all these countries, outward orientation played a paramount role in establishing capitalist structures, whereas the 'indigenous' capitalist class plays a minor role (economically), being mostly restricted to small and medium-sized enterprises. While not all analysts would agree with this analysis, the central role of multinational corporations and foreign direct

investment (FDI) can hardly be disputed. Thus the question arises: what is the effect (if any) of FDI inflows and outward orientation on wage determination. To check for robustness a specification including the openness of the sector (in terms of exports and imports relative to output) and the (lagged) level of FDI stock (relative to output) were included in the regression. Both factors may affect sectoral wages and have figured prominently in analyses of the effects on relocation. Openness and FDI may affect the labour intensity of production and shift real earnings in favour of labour, according to traditional trade theory. The abundant factor, here labour, ought to benefit. Conversely, increased exposure to international trade may decrease the bargaining power of labour and thus shift the wage curve downwards. FDI inflows may also be double-edged. FDI is presumably more sensitive to wage costs than domestic investment, and may affect the slope of the bargaining curve. The overall effects of FDI and openness are thus theoretically ambiguous (Onaran and Stockhammer, 2008).

The inclusion of FDI and openness affects the sample size, since import and export data only start in 1999 and FDI data are not available for all sectors in Poland.[8] Moreover, FDI data are only available at the one-digit level. The results are thus not strictly comparable with the above. According to the regression results summarized in Table 5, sectoral openness has a statistically significant negative effect on (sectoral) wages in Poland and in the Czech Republic and no statistically significant effect elsewhere. FDI stock (relative to output) has a statistically significant

TABLE 5. Wage Regression Including FDI and Openness (one-digit level)

	Slovenia	Slovakia	Hungary	Poland	Czech Republic	Lithuania
X	0.155	0.131	0.155	0.190	0.000	0.190
t	3.696	5.863	5.363	4.265	–0.197	1.549
WT	0.801	0.291	0.503	–0.332	0.836	0.404
t	9.862	2.029	15.184	–2.155	40.762	0.567
FDI	0.104	0.191	0.046	–0.198	–0.091	0.178
t	2.238	3.418	0.989	–1.771	–7.746	0.705
Openness	0.002	–0.038	0.019	–0.008	–0.004	0.006
t	0.272	–1.716	1.073	–0.249	–2.008	0.690
MDV	11.916	9.313	11.296	7.415	9.462	6.830
R^2	0.995	0.988	0.995	0.995	0.997	0.985
F	723.6	320.8	806.1	641.2	1329.0	90.2
Obs	72	72	72	48	72	36
Sample	1999:2003	1999:2003	1999:2003	1999:2003	1999:2004	1999:2001
sectors	12	12	12	8	12	12

positive effect in Slovenia and Slovakia, but a statistically significant negative effect in the Czech Republic and in Poland. However, this latter is not comparable to the other countries since the sample is reduced by one third by a lack of FDI data. It is remarkable that the effect of FDI is positive in Slovenia and Slovakia, which have been relatively more cautious in opening up, but negative in Poland and the Czech Republic, both once paragons of rapid liberalization. Given problems of data quality and the short sample the regression results have to be interpreted with caution. Together with the finding that openness has no or negative effects, the results suggests that at least for labour it may be advantageous to have a government that liberalizes cautiously.

Returning to the robustness of the effect of average wages in these new specifications, the results confirm the strong effect in Slovenia and Czech Republic and indicate intermediate effects in Hungary, Lithuania and Slovakia. In Poland the sign becomes statistically significantly negative. This latter has no economic interpretation, but confirms that Poland is an outlier. Poland and Lithuania show a relatively strong effect of sectoral productivity (though in the case of Lithuania not statistically significant), Slovenia, Hungary and Slovakia show (statistically significant) moderate effects (0.16, 0.16 and 0.13 respectively). For the Czech Republic there seems to be no effect.

The sectors included in our analysis differ among other things in their capital intensity and in the amount of skilled and unskilled labour they use. Wage determination may also differ along these dimensions and not only across countries. Therefore the sectors were disaggregated into three groups: capital-intensive and skilled (CS), capital-intensive and unskilled (CU) and labour-intensive and unskilled (LU).[9] The regression analysis was performed for these groups.[10] The sector groups only contain three to five sectors, however, the precision of coefficient estimates does not deteriorate as standard errors are not larger than in previous specifications. The effect of national wages is statistically significant in all cases and the effect of sectoral productivity is statistically significant in more than two-thirds of the cases, with some statistically insignificant or perverse signs (in Slovenia and Poland), all of which occurred in unskilled sectors. CS sectors have higher coefficient estimates for the effect of national wages than other sectors in all countries except Lithuania. In most countries CU sectors have stronger effects of national wages than LU sectors in most countries, but not in Hungary and the Czech Republic (in Poland the coefficient estimate is very similar). The pattern in the size of the effect of sectoral productivity is less clear. In most countries (but not Poland and Lithuania) CU sectors have the strongest effect of sectoral productivity. In all countries except Lithuania the coefficient higher is in CS than in LU sectors, the latter coefficient being statistically insignificant (at the 5 percent level) or negative in four cases.

As regards wage determination along skill and capital intensity, Lithuania seems to differ from the other countries. However, the results here are not strictly comparable with the rest since data on sector 23 are missing, which – as noted earlier – has high and rapidly growing wages. But our findings may also reflect the fact that unskilled sectors play a more central role in the Baltic than in the Visegrad countries (Bohle and Greskovits, 2006).

Overall, it seems that capital-intensive, skilled sectors have the strongest national factors in wage determination, and labour-intensive, unskilled sectors the weakest. A simple explanation (involving inverse causation) is that capital-intensive, skilled sectors are the leaders in a system of pattern bargaining. Sectoral productivity effects are strongest in capital-intensive, unskilled sector and weakest in labour-intensive, unskilled sectors. This may be explained by the higher organizational level and thus bargaining power of workers in large-scale, capital-intensive firms, where there is also more scope for sharing oligopoly rents. Sectors clearly differ within countries in wage movements. However, the order of magnitude of the coefficient estimates does not change ordering of countries as previously established.

Interpretation and Conclusion

The aim of this article was to explore the relative role of sectoral and national factors in wage determination in CEECs. In Western countries it is widely accepted that the degree of organization of industrial relations, that is the existence of centralized and/or coordinated wage bargaining, leads to wage compression. Alternatively, one can reason that a very competitive setting, that is, disorganized industrial relations, may yield identical outcomes since a uniform wage will be enforced by market pressures throughout the sectors of the economy.

Industrial relations have only recently emerged in Eastern Europe. Consequently, there is little English-language literature on wage determination. The countries offer a significant degree of variation in industrial relations, despite the fact that all are still in the process of development. Slovenia, and to a lesser extent Slovakia have highly organized industrial relations, whereas Lithuania has disorganized. Hungary, Poland, and the Czech Republic, take intermediate places.

Wage regressions were estimated for Slovenia, Slovakia, Hungary, Poland, the Czech Republic and Lithuania for a panel of manufacturing sectors. Sectoral wages were explained by average national wages and sectoral productivity. The effect of sectoral productivity was mostly modest, whereas sectoral wages are strongly linked to national wage movements. The regression results indicate that Slovenia and the Czech

Republic show the strongest national component in wage movements, with minor, if any, effects from sectoral productivity. Slovakia, Hungary, and Lithuania form another group, with substantially weaker national effects and stronger sectoral ones. The ordering between the three with respect to the national component is sensitive to the specification. Lithuania and Poland consistently have the strongest sectoral effects in wage determination. Poland seems to be an outlier. It consistently has the weakest national effects and the strongest sectoral effects.

Newell and Socha investigate the causes of the 'Polish wage inequality explosion'. They find that the rise in inequality was associated with 'rapidly rising returns for highly-qualified workers and falling relative wages for those with only primary education' (2007: 735). They consider the growth of private sector employment in conjunction with higher wage inequality in the private sector as the prime underlying cause. Remarkably, wage bargaining and trade unions are not mentioned in their study. Ost (2002) highlights that Poland experienced a pronounced shift from social-movement to servicing unionism but does not evaluate how, if at all, this affected wage bargaining.

Any interpretation of the relation between the regression results and industrial relations has to proceed with caution. There are various problems with the comparability of the data (including different samples for Lithuania). Moreover, the ranking of the degree of organization of wage bargaining refers to the end of the period of investigation. Lack of accurate data precludes the development of time-varying indices of the degree of coordination, despite the fact that the changes over time were dramatic.

The ordering of the coefficients in the individual countries is roughly consistent with the ranking according to union densities and with the index of effective coordination of wage bargaining. Our findings point in a different direction from Kohl and Platzer's grouping of countries in northern and southern CEEC industrial relations.

There are several possible interpretations of our results. First, the ranking of the coefficients on the impact of national factors in wage bargaining is in line with the ranking in terms of union density and the degree of effective bargaining coordination, which suggests a monotonic relation between union density and the effect of national wages on sectoral wages. In the context of mostly firm-level bargaining the organizational strength (and potentially the political fragmentation) of unions may be the most important factor determining effective wage coordination. While this argument may be theoretically appealing, it is inconsistent with the frequently observed weakness of unions. 'All CEE trade unions continue to lack the capacity to exert pressure through credible threats to engage in industrial action' (Kohl and Platzer, 2007: 618). How then could they effectively coordinate wages?

Factors directly related to wage bargaining seem to be insufficient plausibly to explain the observed pattern. A second interpretation would thus stress other societal factors. This is consistent with the view that one should be cautious in generalizing from Western experiences to the East and with the hypothesis of a distinct transitional model of industrial relations. As unions are weak and collective bargaining coverage low, other institutions' impact on bargaining may become important. Various forms of government activity are the prime candidates.[11] Kohl and Platzer argue that government-administered minimum wage increases have become the 'dominant orientation for collective pay setting and individual remuneration as well' (2007: 620). From a comparison on industrial relocation in the CIS and CEEC, Boeri and Terrell (2002) argue that unemployment benefits may have provided a floor for wages and thereby influenced wage dispersion.

The limitations of this study suggest several avenues for future research. The scope for quantitative methods to give further insight is restricted by data limitations. In particular, cross-country analysis is hardly feasible for such a small group of countries. Therefore future research will have to rely strongly on case studies. First, the explicit and implicit role of trade unions in wage setting should be investigated. To what extent are unions able to influence wages? To what extent are they able and willing to coordinate across sectors and firms? Second, and even more important in context where large segments of the labour market are not covered by collective agreements, is research on the practices of pay setting by the human resource or personnel departments of firms. Interviews such as those conducted by Bewley (1995) in New England could help shed light on questions like: what do firms use as benchmarks in setting wages? Are minimum wages increases an important yardstick?

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NOTES

1. There are, however, two differences that may be explored in future research. First, in a coordinated wage setting the consumption wages ought to be equalized, whereas in a perfectly competitive setting the product wages ought to be equalized as well. Second, the dynamics may

differ. Coordinated wages should by design create equal wages (with little wage dispersion in reaction to shocks), whereas competitive markets, if imperfectly competitive, will give rise to temporary wage dispersion (to generate the necessary labour flows across sectors).

2 We use effective coordination, that is, coordination weighted by coverage, as the measure of the coordination of collective bargaining. This measure is based on Visser (2004), but is not calculated in Visser (2009). Table 1 contains own calculations based on values of coordination and coverage in Visser (2009).

3 Available from the authors upon request.

4 Since we control for national wage, controlling for (national) unemployment rates is redundant because its effects are presumably included in former.

5 This variable will also be referred to as labour productivity. Note that this is a measure of gross productivity, not value added per employee. Unfortunately, data for value added are not available. However, in a time series context one would expect them to behave similarly.

6 Sectoral wages and output are taken from the WIIW Industrial Database Eastern Europe, the average wage for the total economy is from WIIW Handbook of Statistics.

7 Available from the authors upon request.

8 FDI is inward FDI stocks as percentage of output and openness is imports and exports from and to the world as percentage of output. They are taken from the WIIW Database on Foreign Direct Investment and WIIW Industrial Database Eastern Europe respectively.

9 The argument is discussed extensively in Bohle and Greskovits (2006). A complete sectoral taxonomy is available from the authors upon request. The classification of capital- and labour-intensive sectors relies on Greskovits (2005) who presents a taxonomy for the CEECs based on SITC classification and a narrowing down of the five-category taxonomy in Peneder (2001). The skill classification is derived from the three-category WIIW classification in Landesmann et al. (2004), such that low- and medium-skill industries are classified as unskilled, and high-skill industries are classified as skilled. A fourth group, labour-intensive *and* skilled, consisted only of one sector and was hence dropped from the regression analysis.

10 Detailed results are available from the authors upon request.

11 Non-state related factors may play a role as well. Per capita GDP and the impact of national factors in wage setting seem to be positively correlated. Slovenia and the Czech Republic are the most developed among the countries discussed and have the strongest effects of national wages on sectoral wages. Lithuania and Poland, which have the lowest GDP per capita, have the weakest effect of national wages. This is thus what we might call a Kuznets effect, even though such a label would not be entirely accurate: Kuznets's (1955) original finding that inequality decreases with per capita income referred to development over time, whereas our argument refers to differences across countries.

REFERENCES

Aguilera, R. and Dabu, A. (2005) 'Transformation Employment Relations Systems in Central and Eastern Europe', *Journal of Industrial Relations* 47(1): 16–42.

Bewley, T. (1995) 'A Depressed Labor Market as Explained by Participants', *American Economic Review Papers and Proceedings* 85(2): 250–4.

Blau, F. and Kahn, L. (2002) *At Home and Abroad: US Labor Market Performance in an International Perspective*. New York: Russell Sage Foundation

Boeri, T. and Terrell, K. (2002) 'Institutional Determinants of Labor Reallocation in Transition', *Journal of Economic Perspectives* 16(1): 51–76.

Bohle, D. and Greskovits, B. (2006) 'Capitalism without Compromise: Strong Business and Weak Labor in Eastern Europe's New Transnational Industries', *Studies in Comparative International Development* 41(1): 3–25.

Calmfors, L. and Driffill, J. (1988) 'Bargaining Structure, Corporatism and Macroeconomic Performance', *Economic Policy: A European Forum* 3(1): 13–61.

Calmfors, L., Booth, A., Burda, M., Checchi, D., Naylor, R. and Visser, J. (2001) 'The Future of Collective Bargaining in Europe', in T. Boeri, A. Brugiavini and L. Calmfors (eds) *The Role of Unions in the Twenty-First Century*, pp. 1–151. Oxford: Oxford University Press.

Carley, M. (2002) 'Industrial Relations in the EU Member States and Candidate Countries', *EIROnline*, available online at: [http://www.eurofound.europa.eu/eiro/2002/07/feature/tn0207104f.htm].

Egger, P. and Stehrer, P. (2003) 'International Outsourcing and the Skill-specific Wage Bill in Eastern Europe', *World Economy* 26(1): 61–72.

Egger, P., Huber, P. and Pfaffermayr, M. (2005) 'A Note on Export Openness and Regional Wage Disparity in Central and Eastern Europe', *Annals of Regional Science* 39: 63–71.

European Commission (2003) 'Wage Flexibility and Wage Interdependencies in EMU', Chapter 4 of: *European Economy 2003*. Luxembourg: European Communities.

Funk, L. and Lesch, H. (2004) 'Industrial Relations in Central and Eastern Europe', *Intereconomics* 39(5): 264–70.

Gennard, J. (2007) 'Managing Membership Decline in a Hostile Environment: The Case of the Print Unions in the Czech Republic, Slovakia and Hungary', *European Journal of Industrial Relations* 13(1): 89–108.

Greskovits, B. (2005) 'Leading Sectors and the Variety of Capitalism in Eastern Europe', *Actes du GERPISA* 39: 113–28.

Howell, D. and Huebler, F. (2005) 'Wage Compression and the Unemployment Crisis: Labor Market Institutions, Skills and Inequality-unemployment Trade Offs', in D. Howell (ed.) *Fighting Unemployment. The Limits of Free Market Orthodoxy*, pp. 35–71. Oxford: Oxford University Press.

Iara, A. and Traistaru, I. (2004) 'How Flexible are Wages in the EU Accession Countries?', *Labour Economics* 11: 431–50.

King, L. and Szelényi, I. (2005) 'Post-communist Economic Systems', in H. Smelser and R. Swedberg (eds) *Handbook of Economic Sociology*, 2nd edn, pp. 234–53. Princeton, NJ: Princeton University Press.
Kohl, H. and Platzer, H. (2004) *Arbeitsbeziehungen in Mittelosteuropa*. Baden-Baden: Nomos.
Kohl, H. and Platzer, H. (2007) 'The Role of the State in Central and Eastern European Industrial Relations: The Case of Minimum Wages', *Industrial Relations Journal* 38(6): 614–35.
Kuznets, S. (1955) 'Economic Growth and Income Inequality', *American Economic Review* 45(1): 1–28.
Landesmann, M., Vidovic, H. and Ward, T. (2004) 'Economic Restructuring and Labor Market Developments in the New EU Member States', The Vienna Institute for International Economic Studies Research Report.
Myant, M. and Smith, S. (1999) 'Czech Trade Unions in Comparative Perspective', *European Journal of Industrial Relations* 5(3): 265–85.
Newell, A. and Socha, M. (2007) 'The Polish Wage Inequality Explosion', *Economics of Transition* 15(4): 733–58.
OECD (2004) 'Wage-setting Institutions and Outcomes', Chapter 3 of: *Employment Outlook*. Paris: OECD.
OECD (2006) *Employment Outlook 2006*. Paris: OECD.
Onaran, Ö. and Stockhammer, E. (2008) 'The Effect of FDI and Foreign Trade on Wages in the Central and Eastern European Countries in the Post-transition Era: A Sectoral Analysis', *Structural Change and Economic Dynamics* 19(1): 66–80.
Ost, D. (2002) 'The Weakness of Strong Social Movements: Models of Unionism in the East European Context', *European Journal of Industrial Relations* 8(1): 33–51.
Peneder, M. (2001) *Entrepreneurial Competition and Industrial Location.* Northampton, MA: Edward Elgar.
Pollert, A. (1999) 'Trade Unionism in Transition in Central and Eastern Europe', *European Journal of Industrial Relations* 5(2): 209–39.
Pollert, A. (2000) 'Ten Years of Post-communist Central Eastern Europe: Labour's Tenuous Foothold in the Regulation of the Employment Relationship', *Economic and Industrial Democracy* 21: 183–210.
Schroeder, W. (2004) 'Arbeitsbeziehungen in Mittel- und Osteuropa: Weder wilder Osten noch europäisches Sozialmodell', Politikinformation Osteuropa 119.
Siebert, H. (1997) 'Labor Market Rigidities: At the Root of Unemployment in Europe', *Journal of Economic Perspectives* 11(3): 37–54.
Stasek, F. (2005) 'Employee Relations in the Czech Republic: Past, Present and Future', *Employee Relations* 27(6): 581–91.
Traxler, F., Blaschke, S. and Kittel, B. (2001) *National Industrial Relations in Internationalized Markets. A Comparative Study of Institutions, Change and Performance*. Oxford: Oxford University Press.
Visser, J. (2004) Patterns and Variations in European Industrial Relations', Chapter 1 in European Commission, *Industrial Relations in Europe 2004*. Luxembourg: European Communities.

Visser, J. (2009) ICTWSS: Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 34 Countries between 1960 and 2007, available online at: [http://www.uva-aias.net/208].

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