

DEPARTMENT OF ECONOMICS

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how different from the old?**

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RESEARCH PAPER 2007-016
JUNE 2007

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D/2007/1169/016

Wage flexibility in the new European Union members:
how different from the old?*

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Preliminary version
June 2007
Comments welcome

* We are grateful to Joseph Plasmans and Iulia Traistaru for comments.

Abstract

In this paper we provide new evidence on aggregate labour market flexibility in the four largest new EU member states from Central Europe (CEEC4) and a benchmark of existing EU countries (EU9). This is done through direct comparison of several labour market institutions from which we derive an institutional summary indicator. Another approach that we follow is the estimation of aggregate wage Phillips curves from which we obtain estimates for the wage responsiveness to unemployment in these countries.

The results show that the CEEC4 cannot be regarded as an homogeneous group. The Czech Republic and Hungary are relatively flexible and comparable to the United Kingdom. Poland belongs to a subgroup with France, Germany and Italy, with reduced labour market flexibility. The results are especially problematic for the Slovak Republic where aggregate wages do not respond to unemployment, although labour market institutions are still more supportive to flexibility than in most incumbent EU countries.

1. Introduction

The functioning of labour markets has a crucial role in restructuring the transition economies and eliminating inefficient labour allocation inherited from the socialist era. The importance of labour market flexibility further increases with the membership of EU and eventually of EMU. The single currency reduces the variety of policy tools available to the policymakers in these countries and demands extra flexibility of the national labour markets to absorb adverse shocks.

Two different aspects can be regarded in relation with labour market flexibility – the market can basically react to shocks by changes in quantities (labour mobility across regions and sectors) or by changes in prices (wages). Several studies have shown that intra- and international labour mobility in the EU is low. This is also confirmed for the Central and Eastern European economies (CEECs) (Fidrmuc, 2004). Moreover, the widespread use of transition periods by the existing EU members for opening up their labour markets implies that the free movement of labour only contributes marginally to labour market flexibility. Therefore we focus on the flexibility of domestic wages. Wage flexibility is an effective and efficient way to absorb asymmetric shocks.

The goal of our paper is therefore to estimate macroeconomic wage flexibility in four Central and Eastern European countries – the Czech Republic, Hungary, Poland and the Slovak Republic (henceforth called CEEC4)² – and compare it with a benchmark of existing EU members – Belgium, Denmark, France, Germany, Italy, the Netherlands, Portugal, Spain and the United Kingdom (henceforth called EU9). The empirical estimations are based on the bargaining-augmented Phillips curve model developed by Blanchard and Katz (1999). We also present various indicators of labour market characteristics and institutions that may contribute to macroeconomic wage rigidity and compute an overall index of institutional rigidity of the labour market.

² The four countries represent 71% of total GDP of the 10 CEECs. Note, however, that the 10 CEECs together represent only 5.9 % of total GDP of the current EU27.

The rest of the paper is organized as follows. In the next section (section 2) we document the labour market developments in the individual CEEC4. In section 3 we give an overview of existing studies on wage flexibility in the CEECs. Since labour market institutions often constitute the basis for differences in wage rigidity we give an overview of the differences and similarities in the institutional settings in the countries concerned (section 4). The fifth section reports regression results for the wage Phillips curves for the CEEC4 and the EU9 from which estimates of real wage rigidity can be derived. The paper ends with conclusions and policy suggestions.

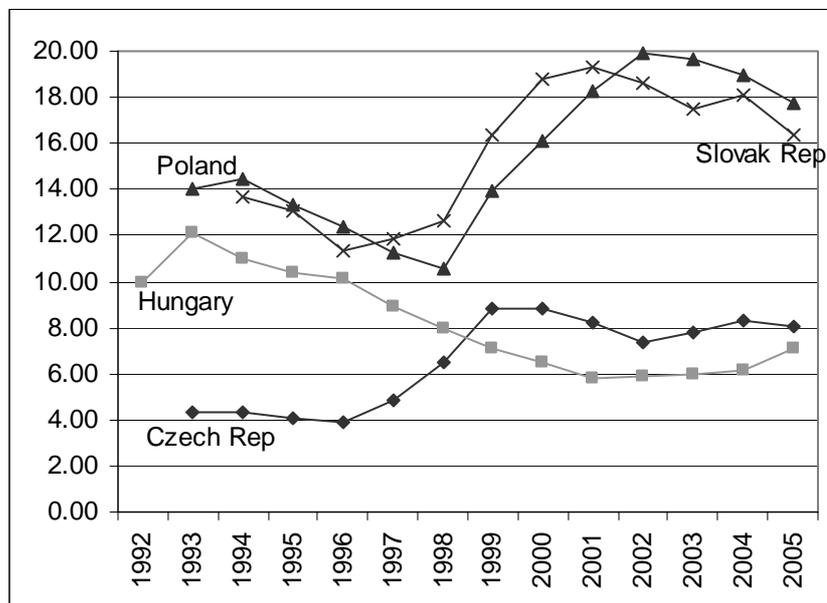
2. Labour market developments in the CEEC4

At the beginning of the 1990s the economies behind the iron curtain were drastically reformed. Trade liberalisation and reorientation resulted in a collapse in output. Subsidies for enterprises were cut and together with privatisation this led to abrupt corrections to the ineffective labour allocation. As a result open unemployment rose sharply.

Figure 1 shows the evolution of unemployment in the CEEC4. There are striking differences among the countries concerned. Throughout the period Poland and the Slovak Republic have been characterized by high unemployment. In 2006 they still faced unemployment rates of 14.0% and 13.3% respectively, much higher than Hungary (7.5%) and the Czech Republic (7.2%). After the effects of the first political and economic reforms at the beginning of the 1990s had faded out, output recovered and unemployment started to fall. However, in the wake of the Czech (1997) and the Russian (1998) crises it again sharply increased by the end of the 1990s in Poland, the Slovak Republic and the Czech Republic. Since then unemployment remained more or less constant or decreased only moderately in these countries. The trajectory of the Hungarian unemployment rate is quite different. Hungary did not face an increase in unemployment by the end of the 1990s but instead witnessed a

continuous decline until the start of the new millennium. Since then Hungarian unemployment has moderately increased.

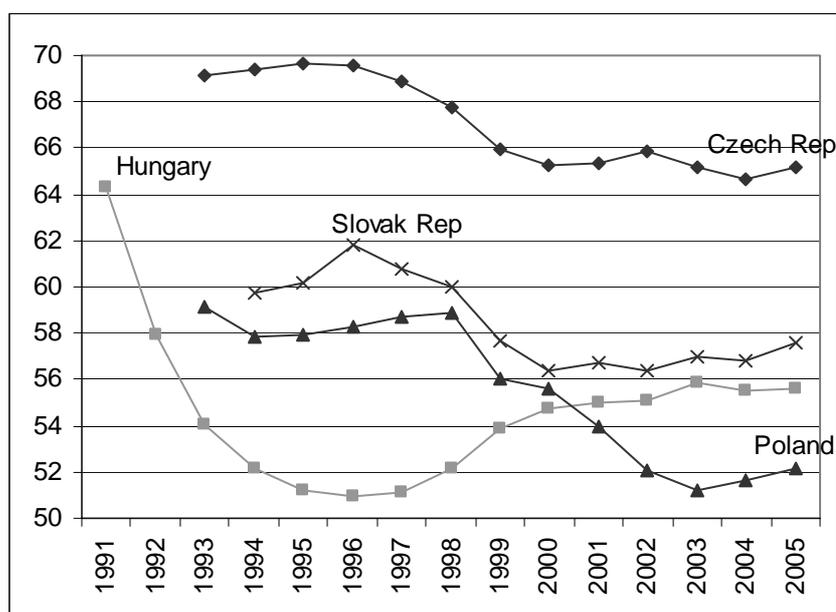
Figure 1. Unemployment in the CEEC4.



Source: OECD Economic Outlook database.

Figure 2 illustrates that there exist also marked differences in employment levels. Poland (52.1 % in 2005), the Slovak Republic (57.6 %) and Hungary (55.6 %) have substantial lower employment rates than the Czech Republic. In the four countries employment in 2005 is still well behind the beginning of the 1990s. The situation is especially worrisome in Poland with low and declining employment levels. By contrast, in Hungary the employment rate, although still low, has been increasing since the mid 1990s.

Figure 2. Employment in the CEEC4.



Source: OECD Economic Outlook database.

3. Wage flexibility in the CEECs: overview of existing studies

There exist by now several studies empirically analyzing wage flexibility in the Central and Eastern European countries.

The “wage curve” approach originated by Blanchflower and Oswald (1994), using regional and micro level data dominates in the empirical literature. They specify a regression equation with the (log)wage depending on the (log of) the local unemployment rate and other characteristics and find wages and local unemployment rates to be negatively correlated in a sample of highly developed economies. The estimated wage elasticity with respect to unemployment is about -0.1, implying that doubling of the (local) unemployment rate leads to a reduction of the wage by 10%. The result holds remarkably well for most western countries. This research has by now been extended to the CEECs. Many studies find that regional wages in the CEECs tend to respond to local labour market conditions as well. Kertesi and Köllő (1997) e. g.

estimate a wage curve on Hungarian micro level data and find the relation between workers' remuneration and the state of the labour market to be similar to that observed in developed countries. They show that the Hungarian wage elasticity increased from -0.02 to -0.10 between 1989 and 1996. The similarity of the wage curve between transition countries and developed countries is also reported by Blanchflower (2001) for 11 Eastern European countries using household survey data. Their estimated elasticities range from -0.1 to -0.3 which is higher than those found by Blanchflower and Oswald (1994) for developed economies. Huitfeldt (2001) estimates the wage curve model in the Czech and Slovak Republics for the period 1992-1998. He finds that the unemployment elasticity of pay is two times higher in Slovakia where the elasticity equals -0.1 than in the Czech Republic. Iara and Traistaru (2004) find empirical evidence for a negative relation between real wages and unemployment in Bulgaria, Hungary and Poland using regional data, while the unemployment elasticity of pay for Romania is reported as not statistically significant. The result is confirmed for Poland by Yamaguchi (2005). His estimates further show that wages are less elastic in a high-unemployment/low wage environment. The latter conclusion is confirmed by Galuk and München (2003) for the Czech Republic. Czech real wages adjust to changes in local employment in districts with low unemployment rates but in regions with high unemployment wages become inelastic with respect to unemployment.

Another approach for estimating wage flexibility makes use of macroeconomic data and starts from the (wage) Phillips-curve. In this case the change in the (real) wage is regressed on the unemployment rate and other specific variables, such as the rate of change of productivity. Radziwiłł and Walewski (2003) e. g. investigate macroeconomic labour market flexibility in six EU candidate countries for the period 1993-2002. They find negative and statistically significant relations between the change in domestic unit labour costs and the unemployment rate in three countries – Lithuania, Poland and the Slovak Republic. In the other countries – the Czech Republic, Hungary and Latvia – aggregate wages appear to be inflexible. Babetskii (2006) estimates real

wage elasticities in eight CEECs using time-series and pooled data. He finds limited wage flexibility in three countries i. e. the Czech Republic, Lithuania and the Slovak Republic. The wages in Estonia, Hungary, Poland, Latvia and Slovenia turn out to be inflexible. An interesting finding of Babetskii (2006) is that wage flexibility in all CEECs becomes lower in the period 2000-2004 compared to 1995-1999 and that wage elasticity has even become insignificantly different from zero in some of them.

Summing up, the existing research reveals large differences in estimates of elasticities of wages in CEECs.

Table 1 gives an overview of the available results for the CEEC4. Although no clear conclusion emerges from these studies the general impression is one of low and decreasing aggregate wage flexibility in these countries, whereas regional wage flexibility is found to be in line with western countries. This contradicts with our own findings (see section 5).

Table 1. Overview of existing research on wage flexibility in the CEEC4.

Country	Period	Authors	Conclusion	Remarks
Czech Republic	1996-2001	Galuščák and München (2003)	Wages adjust to changes in local unemployment in districts with low unemployment rates, a low share of public sector and for the short-term unemployed. Wages are rigid in districts with high unemployment rates and for the long-term unemployed.	microeconomic data, wage curve model
	1992, 1994-1997	Blanchflower (2001)	Significant but limited wage elasticity of -0.02.	microeconomic data, wage curve model
	1992-1998	Huitfeldt (2001)	Regional unemployment elasticity of pay ranges -0.01- -0.07	microeconomic data, wage curve model
	Quarterly data 1993-2002	Radziwiłł and Walewski (2003)	No responsiveness of domestic unit labour costs to changes in unemployment	macroeconomic data, Phillips curve model

	Quarterly data 1995-2004	Babetskii (2006)	Wage flexibility found for the individual time-series and pooled dataset for the period 1995-99.	macroeconomic data, Phillips curve model
Hungary	1989, 1992-1995	Kertesi and Köllö (1997)	Wage curve similar to the mature market economies, wage elasticity of -0.09 - -0.1	microeconomic data, wage curve model
	1990-1997	Blanchflower (2001)	Significant wage elasticity of -0.05.	microeconomic data, wage curve model
	1993	Blanchflower (2001)	Significant wage elasticity of -0.4.	microeconomic data, wage curve model
	Quarterly data 1993-2002	Radziwiłł and Walewski (2003)	No responsiveness of domestic unit labour costs to changes in unemployment	macroeconomic data, Phillips curve model
	1992-1999	Iara and Traistaru (2003)	Regional real earnings adjust to the local unemployment levels with a delay of two years.	microeconomic data, wage curve model
	Quarterly data 1995-2004	Babetskii (2006)	Wage flexibility found only for the pooled dataset and the period 1995-99.	macroeconomic data, Phillips curve model
Poland	1991-1997	Blanchflower (2001)	Significant wage elasticity of -0.1.	microeconomic data, wage curve model
	1993	Blanchflower (2001)	Significant wage elasticity of -0.2.	microeconomic data, wage curve model
	1992-1999	Iara and Traistaru (2003)	Regional real earnings adjust to the local unemployment levels with a delay of one year. Wage elasticity of -0.06	microeconomic data, wage curve model
	Quarterly data 1993-2002	Radziwiłł and Walewski (2003)	Small responsiveness of domestic unit labour costs to changes in unemployment (10% probability level)	macroeconomic data, Phillips curve model
	1995-2002	Yamaguchi (2005)	Significant but small wage elasticity of -0.06. Wages are less elastic in a high-unemployment/low wage environment	microeconomic data, wage curve model
	Quarterly data 1995-2004	Babetskii (2006)	Wage flexibility found only for the pooled dataset and the period 1995-99. Real wages became less flexible after 1998	macroeconomic data, Phillips curve model
Slovak Republic	1995	Blanchflower (2001)	Significant wage elasticity of -0.05.	microeconomic data, wage curve model

1993	Blanchflower (2001)	Significant wage elasticity of -0.2.	microeconomic data, wage curve model
1992-1998	Huitfeldt (2001)	Regional unemployment elasticity of pay -0.1	microeconomic data, wage curve model
Quarterly data 1993-2002	Radziwiłł and Walewski (2003)	Domestic unit labour costs react to changes in unemployment.	macroeconomic data, Phillips curve model
Quarterly data 1995-2004	Babetskii (2006)	Wage flexibility found for the individual time series and pooled dataset for the period 1995-99.	macroeconomic data, Phillips curve model

4. Labour market institutions in the CEEC4

In section 2 we showed that labour markets in the CEEC4 are characterised by relatively high levels of unemployment and low employment rates. A possible explanation for the relatively poor labour market performance in those countries is that their labour market institutions are supportive to low labour market equilibria, especially after the transition and the big shocks that hit these economies. The combination of shocks and institutions has been put forward as the main explanation for the poor labour market performance in a number of European countries (Blanchard and Wolfers, 2000)³. In this section we therefore present various aspects of the institutional settings of the labour market in the CEEC4 and compare them with the EU9. We consider those labour market institutions that have received a lot of attention by researchers, viz:

- 1) employment protection legislation (EPL);
- 2) trade union power;
- 3) level of wage bargaining and coordination mechanisms;
- 4) spending on active labour market policies (APL);

³ For a different opinion, see Blanchflower (2001).

5) employment benefits;

6) taxation of wages.

Employment protection legislation reflects the restrictions to employers to dismiss workers and the required compensation mechanisms in case of dismissals. The strictness of those regulations can increase the cost of hiring workers, reduce the flow of vacancies and, therefore, result in higher levels of unemployment or lower levels of employment.

The OECD has developed a methodology for the construction of an index of employment protection. The scale runs from 0 to 6 with the strictness of employment protection legislation. It covers regular and temporary employment, as well as collective dismissals. In our analysis we concentrate on the first two aspects and a compound index computed as a simple average of the regular and temporary employment indexes.

Table 2 shows that employees with a regular contract are on average more protected against dismissal in the CEEC4 than EU9. However, the new members as well as the EU9 are far from a homogeneous group, the index for 2003 ranging from 1.9 in Hungary to 3.5 in the Slovak Republic and from 1.1 in the UK to 4.3 in Portugal. In the case of temporary employment, employers in the CEEC4 face considerably more flexibility than in the EU9 (except for Denmark, the Netherlands and the UK).

Judged by the overall index, the CEEC4 are more flexible than the EU9 countries with respect to overall employment protection. They are also more homogeneous. Employment protection legislation in the CEEC4 is somewhere in the middle of that of the group of EU9 which is characterised by wide variations. Further, some tendency for convergence in employment protection legislation is noticeable. In countries with strict protection like the Slovak Republic, Belgium, Germany and Italy, there is a tendency for more flexibility (through less protection of temporary workers).

Table 2. Employment Protection Legislation (EPL)¹.

	Regular employment			Temporary employment			Overall EPL		
	early 1990s	late 1990s	2003	early 1990s	late 1990s	2003	early 1990s	late 1990s	2003
Czech Rep	3.3	3.3	3.3	0.5	0.5	0.5	1.9	1.9	1.9
Hungary	1.9	1.9	1.9	0.6	0.6	1.1	1.3	1.3	1.5
Poland	2.2	2.2	2.2	0.8	0.8	1.3	1.5	1.5	1.7
Slovak Rep	3.6	3.6	3.5	1.1	1.1	0.4	2.4	2.4	1.9
CEEC4	2.8	2.8	2.7	0.8	0.8	0.8	1.8	1.8	1.8
Belgium	1.7	1.7	1.7	4.6	2.6	2.6	3.2	2.2	2.2
Denmark	1.5	1.5	1.5	3.1	1.4	1.4	2.3	1.4	1.4
France	2.3	2.3	2.5	3.6	3.6	3.6	3.0	3.0	3.0
Germany	2.7	2.7	2.7	3.7	2.3	1.8	3.2	2.5	2.2
Italy	1.8	1.8	1.8	5.4	3.6	2.1	3.6	2.7	1.9
Netherlands	3.1	3.1	3.1	2.4	1.2	1.2	2.8	2.1	2.1
Portugal	4.5	4.3	4.3	3.4	3.0	2.8	3.9	3.7	3.5
Spain	3.8	2.6	2.6	1.9	3.3	3.5	2.9	2.9	3.1
UK	0.9	0.9	1.1	0.3	0.3	0.4	0.6	0.6	0.7
EU9	2.5	2.3	2.4	3.2	2.4	2.2	2.8	2.3	2.2
All	2.6	2.5	2.5	2.4	1.9	1.7	2.5	2.2	2.1

Note: ¹ – Index, scale from 0 (lowest) to 6 (highest)EPL. The EPL Version I of OECD is used for overall index.

Source: OECD (2004) Employment Outlook 2004, Brandt, Burniaux and Duval (2005).

The power and influence of labour unions in wage bargaining can be measured by indicators such as union density and union coverage.

As shown in Table 3 union density sharply decreased during the 1990s in the four CEECs considered. Some EU9 countries, such as Germany, Portugal and the UK also witnessed a significant decline in union membership. By 2000 union density in the CEEC4 was relatively low and comparable to the most of the EU9 countries, with the exceptions of Belgium and especially Denmark which are still highly unionised. Union coverage (the share of workers whose wages and working conditions are determined by union bargaining even when they are not union members) is, however, significantly lower in the CEEC4 than in the EU9 countries (except for the United Kingdom). Collective agreements cover over 80%

of the labour force in most EU9 countries as compared to only 36% in the CEEC4.

Table 3. Trade union density and coverage.

	Union density		Union coverage
	1990	2000	late 1990s
Czech Rep	46	27	25+
Hungary	63	20	30+
Poland	33	15	40+
Slovak Rep	57	36	50+
CEE C4	49.8	24.5	36.3+
Belgium	54	56	95+
Denmark	75	74	80+
France	10	10	90+
Germany	31	25	68+
Italy	39	35	80+
Netherlands	25	23	80+
Portugal	32	24	80+
Spain	11	15	80+
UK	39	31	30+
EU9	35.1	32.6	75.9+
All	39.6	30.1	63.7+

Note: + indicates that the figure is a minimum.
Source: OECD (2004) Employment Outlook 2004.

As argued by Calmfors and Driffill (1988), the outcomes of wage bargaining can also depend on the level at which it takes place, with bargaining at the intermediate level of centralisation contributing to a higher degree of wage rigidity. With the exception of the UK, wage bargaining in the EU9 countries predominantly takes place at the industry, i.e. the intermediate, level of bargaining or through a combination of industry and company level. The average centralization of bargaining level in the EU9 is considerably higher than in the CEEC4 where company level negotiations dominate (see Table 4, column 1 and 2).

Table 4. Centralisation and coordination of wage bargain, 1995-2000.

	Centralisation ¹		Coordination ²		Centralisation transformed	Adjustment for coordination
	1990-1994	1995-2000	1990-1994	1995-2000		
Czech Rep	1	1	1	1	1	1
Hungary	1	1	1	1	1	1
Poland	1	1	1	1	1	1
Slovak Rep	2	2	2	2	3	3
CEEC4	1.3	1.3	1.3	1.3	1.5	1.5
Belgium	3	3	4	4.5	5	4
Denmark	3	2	3	4	4.5	4
France	2	2	2	2	3	3
Germany	3	3	4	4	5	4
Italy	2	2	3	4	3	2.5
Netherlands	3	3	4	4	5	4
Portugal	4	4	4	4	3	2
Spain	3	3	3	3	5	5
UK	1	1	1	1	1	1
EU9	2.7	2.6	3.1	3.4	3.8	3.3
All	2.2	2.2	2.5	2.7	3.1	2.7

Source: OECD (2004) Employment Outlook 2004 and own calculations.

¹ 1 = Company and plant level predominant; 2 = Combination of industry and company/plant level, with an important share of employees covered by company bargains; 3 = Industry-level predominant; 4 = Predominantly industrial bargaining, but also recurrent central-level agreements; 5 = Central-level agreements of overriding importance.

² 1 = Fragmented company/plant bargaining, little or no co-ordination by upper-level associations; 2 = Fragmented industry and company-level bargaining, with little or no pattern-setting; 3 = Industry-level bargaining with irregular pattern-setting and moderate co-ordination among major bargaining actors; 4 = a) informal co-ordination of industry and firm-level bargaining by (multiple) peak associations, b) co-ordinated bargaining by peak confederations, including government-sponsored negotiations (tripartite agreements, social pacts), or government imposition of wage schedules, c) regular pattern-setting coupled with high union concentration and/or bargaining co-ordination by large firms, d) government wage arbitration; 5 = a) informal co-ordination of industry-level bargaining by an encompassing union confederation, b) co-ordinated bargaining by peak confederations or government imposition of a wage schedule/freeze, with a peace obligation.

Besides the degree of centralisation, coordination of wage bargaining is an important institutional characteristic of the labour market (Soskice, 1990).

In this particular context, coordination refers to the extent to which wage bargaining takes into account the effects of wage agreements on the economy as a whole (internalisation of these effects). While centralised bargaining tends to result in such internalisation more easily, it is by no means guaranteed to do so. In the case of centralised wage bargaining different trade unions may, for example, try to get the better of each other (cf. the political allegiance or “pillarisation” of trade unions in Belgium), or it may be the case that central agreements are not respected at the lower levels, which may give rise to wage drift. In a decentralised system, coordination may be enhanced by the presence of a pace-setting industry, which leads the way for other sectors (e.g. the metal industry in Germany), or by various forms of government intervention in the wage bargaining process. In Belgium, for example, the government has the right to invoke the law on the preservation of competitiveness (1996) and, in principle, may intervene in the wage formation process if wage agreements exceed a so-called wage norm.

Table 5. Spending on active labour market policies.

	Active spending (as % of GDP)		Active spending per unemployed person (% of GDP per capita)	
	1994	2002	1994	2002
Czech Rep	0.15	0.17	7.20	4.67
Hungary	0.61	0.52	13.98	22.18
Poland	0.45	0.13	7.08	1.45
Slovak Rep	0.51	0.46	8.14	5.05
CEEC4	0.43	0.32	9.10	8.34
Belgium	1.33	1.25	33.53	42.97
Denmark	1.74	1.59	40.95	69.80
France	1.27	1.25	23.87	31.92
Germany	1.33	1.18	32.52	28.72
Italy	1.36	0.57	30.69	15.10
Netherlands	1.50	1.85	47.15	114.33
Portugal	0.67	0.74	19.70	28.07
Spain	0.48	0.87	4.81	17.16
UK	0.53	0.37	11.40	15.11
EU9	1.13	1.07	27.18	40.35
All	0.92	0.84	21.62	30.50

Note: ¹ – the figures exclude the spending on public employment service and administration.

Source: OECD (2006) Employment Outlook.

With respect to coordination the four CEECs form a close group with predominantly fragmented company or plant level bargaining and little or no coordination by upper-level associations, or fragmented industry and company-level bargaining with little or no pattern-setting. In the EU9 the picture is more diverse, with more informal coordination or coordination by peak confederations and/or government intervention in the wage formation process (the exception being France and again the UK with little or no coordination).

The CEEC4 policy-mix to support the unemployed is also very different from that of the EU9 (see Table 5). Both groups of countries apply passive measures such as unemployment benefits as well as active policies such as training, job assistance, public employment etc. Spending on active labour market policies is, however, low in the CEEC4, the average being less than 0.5% of GDP and close to 9% of GDP per capita per unemployed person. A notable exception is Hungary. In the EU9 spending on active labour market policies is much higher, especially in Denmark and the Netherlands (both as a % of GDP and as a % of GDP per capita per unemployed person). Notable exceptions are Italy and the United Kingdom.⁴

The duration of unemployment benefits is under one year in the CEEC4 except for Poland (see Table 6). In most of the EU9 countries except Italy and the United Kingdom unemployed persons are entitled for benefits longer than one year, with the extreme of Belgium where the benefits can be paid without any time limit. The generosity of an unemployment benefit system may create incentives to remain unemployed for a longer time. The table also shows net replacement rates for the CEEC4 and EU9 for different family types as a percentage of the average wage of a production worker. In the CEEC4 the net replacement rates tend to be

⁴ The different evolution of active spending (as % of GDP) and active spending per unemployed (as % of GDP per capita) in some countries can be explained by the evolution of unemployment rate and/or the activity rate in the countries involved. This can be shown by the following relationship: $s = s_u \cdot u \cdot a$

With s: active spending (as % of GDP), s_u : active spending per unemployed (as a % of GDP per capita), u: unemployment rate (in % of active population), a: activity rate (as a % of population).

lower than in the EU9. However the diversity prevails in both groups, so that no firm conclusions can be drawn. Again the United Kingdom is atypical for the group of EU9 countries and is more in line with the CEEC4.

Table 6. Net Replacement Rates for three family types, at 100% APW¹ and duration of benefits, 2004.

	No children	2 children		Duration in months
	Single person	One-earner married couple	Two-earner married couple	
Czech Rep	50	61	74	6
Hungary	43	52	70	9
Poland	52	54	68	18
Slovak Rep	64	57	83	9
CEE C4	52.3	56.0	73.8	
Belgium	63	59	74	unlimited
Denmark	61	73	77	48
France	73	77	84	30
Germany	61	77	91	12
Italy	54	62	79	6
Netherlands	71	80	83	18
Portugal	78	86	88	30
Spain	69	75	87	24
UK	45	65	65	6
EU9	63.9	72.7	80.9	
All	60.3	67.5	78.7	

Notes: ¹ – income of average production worker.

Source: OECD Benefits and Wages, www.oecd.org/els/social/workincentives .

Last but not least, we turn our attention to the tax level as an important institutional characteristic of the labour market. Riboud et al. (2002) and Cazes (2002) have drawn attention to the high tax levels on labour for the CEECs. As a matter of fact, as Table 7 shows, average and marginal tax rates on wages in the CEEC4 are in general not very different from those of the EU9. Wages are taxed at comparable rates and cross-country variability rather than cross-group differences can be observed.

Based on three of the four measures of the tax burden on labour in Table 7 the United Kingdom is the country with the lowest tax rate among the countries considered in. Belgium (average tax rate) and Hungary (marginal tax rate) qualify as the countries that most heavily tax wages.

Table 7. Average and marginal tax rates, 2005.

	Average rate, 100% of APW		Marginal rate, 100% of APW	
	No children Single person	2 children Married couple	No children Single person	2 children Married couple
Czech Rep	43.8	39.0	48.1	48.1
Hungary	50.5	41.1	77.2	77.2
Poland	43.6	43.1	45.8	45.8
Slovak Rep	38.3	31.7	44.4	43.8
CEEC4	44.1	38.7	53.9	53.7
Belgium	55.4	48.2	66.4	66.4
Denmark	41.4	34.5	49.2	43.7
France	50.1	42.5	55.8	52.0
Germany	51.8	44.8	65.1	62.3
Italy	45.4	40.9	52.7	52.7
Netherlands	38.6	36.1	51.0	51.0
Portugal	36.2	27.9	47.1	38.6
Spain	39.0	35.4	45.5	45.5
UK	33.5	28.2	40.6	40.6
EU9	43.5	39.3	54.4	52.7
All	43.7	38.0	53.0	51.4

Source: OECD Taxing Wages 2000-2005 database.

In order to establish the overall position of a country with respect to its labour market institutional rigidity we construct a summary index. This is done in Table 8 according to the following procedure. For each of the six selected indicators we first transform the country figure as follows:

$$x_i = \frac{X_i}{\sum X_i} \times 100$$

where X_i is basic data and x_i normalised data for country i .

This brings the various indicators in the same scale while keeping the original distances among the different countries unchanged. Before we do this we compute the basic data as follows:

- employment protection legislation: average of the overall EPL index of the early 1990s, late 1990s and 2003;
- trade union density and coverage: average of union density for 1990 and 2000 and union coverage in late 1990s;

- centralisation and coordination of wage bargaining. First, accepting the hypothesis of a hump shaped relationship between bargaining centralisation and wage rigidity we transform the centralisation scores into centralisation-rigidity scores as follows: 1 and 5 become 1, 2 and 4 become 3 and 3 becomes 5 (see column 5 in Table 4). Next we correct this concentration-rigidity score for the degree of bargaining coordination. This reflects the insight that wage rigidity in countries with intermediate bargaining levels is mitigated if there is enough wage coordination. In countries with very decentralised wage bargaining there is no need for this coordination mechanism. The resulting overall centralisation-coordination rigidity score is given in column 6 of Table 4;
- spending on active labour market policies: average of active spending as % of GDP for 1994 and 2002, and active spending per unemployed person (per GDP per capita) over the same two years. Then the average value has been transformed according to the formula $v_i = 100 - V_i$ where V_i is the average value and v_i our basic value for further scaling;
- generosity of unemployment benefit system. First the average of net replacement rates for the three family types is computed. This average and the benefit duration are separately transformed into normalised data. Next these two values are averaged;
- tax on wages: average of average and marginal tax rates for the two family types.

Finally, the summary indicator which is shown in the last column of Table 8 is computed as a simple average of the six constituting transformed data. The advantage of this summary indicator is that it combines information from various underlying data into one concise figure that facilitates comparison among countries.

Table 8. Summary of labour market institutions.

	Employment protection legislation	Trade union density and coverage	Wage bargaining centralisation and coordination	Active labour market policies	Generosity of unemployment benefit system	Tax on wages	Average
Czech Rep	6.5	4.8	2.8	8.6	4.5	7.4	5.8
Hungary	4.6	5.6	2.8	8.1	4.7	10.2	6.0
Poland	5.4	5.0	2.8	8.7	6.5	7.4	5.9
Slovak Rep	7.6	7.5	8.3	8.6	5.4	6.5	7.3
CEEC4	6.0	5.7	4.2	8.5	5.3	7.9	6.3
Belgium	8.6	11.7	11.1	7.1	14.5	9.8	10.5
Denmark	5.8	12.1	11.1	6.4	12.6	7.0	9.2
France	10.2	7.8	8.3	7.6	9.8	8.3	8.7
Germany	9.0	7.5	11.1	7.5	6.4	9.3	8.5
Italy	9.4	9.1	5.6	7.8	4.7	7.9	7.4
Netherlands	7.9	8.1	11.1	5.2	7.6	7.3	7.9
Portugal	12.7	8.4	8.3	7.8	10.1	6.2	8.9
Spain	10.1	7.3	13.9	8.4	8.6	6.8	9.2
UK	2.2	5.1	2.8	8.3	4.3	5.9	4.8
EU9	8.4	8.6	9.3	7.3	8.8	7.6	8.3
All	7.7	7.7	7.7	7.7	7.7	7.7	7.7

As intuitively expected from the overview of the different institutions labour market institutions in the CEEC4 are on average more supportive to wage flexibility than in the EU9. The overall indicator equals 6.3 for the CEEC4 and 8.3 for the EU9. These differences also prevail on the level of the individual labour market characteristics: employment protection legislation is lower in the CEEC4, trade union density and coverage are lower as well, wages are bargained on a more decentralised level and unemployment benefits are less generous. Only with respect to taxes on labour the differences between both group are neglectable and there is more use of active labour market policies in the EU9. This being said, the differences among the individual countries are striking. The United Kingdom has by far the most flexible labour market of our sample of countries. The summary indicator equals 4.8 compared to an average for

the whole sample of 7.7⁵. With a summary indicator of 10.5 Belgium is the country with the most rigid labour market institutions, followed by Denmark and Spain (both 9.2), France (8.7) and Germany (8.5). Labour market institutions in the Czech Republic (5.8), Hungary (6.0) and Poland (5.9) are on the flexible side, although they are more rigid than in the UK. Slovakia is more in line with the continental European countries such as France, Germany, Italy and the Netherlands.

5. Phillips curve estimations

In this section we report the results of estimating a wage equation for the countries considered. Theoretical models (such as bargaining models) suggest a negative relationship between the *level* of the wages and the unemployment rate, given the reservation wage and the level of productivity. This is the so-called *wage curve* relationship. Empirical findings, however, often suggest a *Phillips curve* relationship between wages and unemployment, i.e. a negative relationship between the *rate of change* of wages and the unemployment rate. The Phillips curve specification corresponds to a dynamic wage curve model with the restriction that the dependent variable (log wage) enters with the first lag only and with the coefficient equal to one. Blanchard and Katz (1999) reconcile the theoretical and empirical specifications of the wages-unemployment relationship by interpreting the reservation wage as depending on productivity and lagged wages. This results in the following specification:

$$\Delta w_t = c + \Delta pc_t^e + \varphi(w_{t-1} - pc_{t-1} - z_{t-1}) + \beta u_t + \delta \Delta z_t + \varepsilon_t \quad (1)$$

where w and pc are the logs of the nominal wage and (consumption) price level, e denotes expectations, u is the unemployment rate and z is the logarithmic labour productivity. Δx stands for the growth rate of x .

⁵ By construction the average for each characteristic and for the overall indicator equals 7.7(=100/13).

According to the equation (1) wage growth is determined by inflation expectations, the level of the unemployment rate (the Phillips curve effect), the change in productivity and an 'error correction' term, $(w_{t-1} - pc_{t-1} - z_{t-1})$, implying an adjustment of real wages to (trend) labour productivity over time. In fact real wages adjust to marginal productivity, but assuming a Cobb-Douglas production function, marginal productivity $(\partial Y_t / \partial L_t)$ equals average productivity $(Y_t / L_t = z_t)$. Inflation expectations are assumed to be a convex combination of current and lagged inflation (adaptive expectations):

$$\Delta pc_t^e = \alpha \Delta pc_t + (1 - \alpha) \Delta pc_{t-1} = \alpha \Delta \Delta pc_t + \Delta pc_{t-1} \quad (2)$$

The closer α to one, the larger the effect of current inflation or institutionalized indexation ($\alpha=1$ implies contemporaneous full indexation) and, consequently, the smaller effect of lagged inflation. Substituting (2) in (1) and adding the difference between consumer and output price inflation (to test for a terms of trade effect) and changes in the unemployment rate (to test for possible hysteresis effects), the regression specification takes the following form:

$$\Delta(w_t - pc_{t-1}) = c + \alpha \Delta \Delta pc_t + \beta u_t + \gamma \Delta u_t + \varphi(w_{t-1} - pc_{t-1} - z_{t-1}) + \delta \Delta z_t + \theta(\Delta p_t - \Delta pc_t) + \varepsilon_t \quad (3)$$

In this specific setting with adaptive expectations, the impact of unemployment on nominal (Δw_t) and real ($\Delta(w_t - pc_{t-1})$) wage growth is interchangeable, as can be seen from (3) and (1). A theoretical justification for this "bargaining-augmented Phillips curve" can be found in Knoester and Van der Windt (1987). Wage growth in the private sector (Δw) is shown to be the outcome of negotiations between unions and employers, more specifically a weighted average of wage growth claims of unions and wage growth offers of employers. Unions' claims are assumed to reflect compensation for changes in consumer prices (Δpc) and for labour productivity growth in the private sector (Δz). Employers' offers are derived from marginal productivity conditions for profit maximising firms. The wage offers are shown to include compensation for changes in *output*

prices (Δp) and changes in labour productivity (Δz). Finally, the Phillips curve effect is introduced by the assumption that the respective bargaining power of unions and employers depend on the labour market situation, reflected by the unemployment rate (u).

We estimate equation (3) with unbalanced pooled data using OLS⁶. To reflect heterogeneity in wage flexibility in the selected countries we use country specific slope coefficients. Moreover to avoid endogeneity problems we instrument current unemployment with lagged unemployment. So the estimated equation is:

$$\begin{aligned} \Delta(w_{i,t} - pc_{i,t-1}) = & c + \alpha \Delta \Delta pc_{i,t} + \beta_0 (1 + \beta_{i,1} D_i) u_{i,t-1} + \gamma_0 (1 + \gamma_{i,1} D_i) \Delta u_{i,t-1} \\ & + \varphi (w_{i,t-1} - pc_{i,t-1} - z_{i,t-1}) + \delta \Delta z_{i,t} + \theta (\Delta p_{i,t} - \Delta pc_{i,t}) + \varepsilon_{i,t} \end{aligned} \quad (3')$$

with D_i : country dummy (taking the value of 1 for country i and zero otherwise).

The sample consists of annual observations for the period 1990-2005 and variables are taken from the OECD Economic Outlook Database. w , pc , p and z are expressed in logarithms, while the unemployment rate is expressed in levels (as a decimal). For the construction of the error correction term trend labour productivity based on a Hodrick-Prescott filter is used.

The regression results are shown in Table 9 are reported for the CEEC4 and EU9 separately and for the entire sample. The change in the unemployment rate turns out to be insignificant in all countries and is therefore not included in the reported regressions. Inflation changes are significant for both groups and the effect seems stronger in the CEECs than in the EU9, which could be explained by the greater variability of price inflation in the first group of countries. Yet the estimated coefficients are not significantly different from each other. Changes in productivity have a significant effect on wages in both country groups and the effect is significantly larger in the CEEC4, which motivates the introduction of the

⁶ The Hausman test gives a statistically significant chi square (49.58, prob 0.0005). The individual cross-section effects are correlated with the explanatory variables and therefore we can use the fixed effects model.

productivity CE dummy in the estimations for the entire sample. The terms of trade effect is only significant in the estimations based on the entire sample, but there is no indication that the two groups differ significantly in this respect.

We are particularly interested in the coefficients for the unemployment rate which we interpret as a measure of real wage flexibility. Apart from the Slovak Republic these coefficients turn out to be negative, as theoretically expected. They are statistically significant at 99 per cent for all countries, except for the Slovak Republic and Portugal. This contradicts with Radziwiłł and Walewski (2003) who were not able to find a negative relation for Hungary and the Czech Republic, but found wages to respond to unemployment in the Slovak Republic.

Although the estimations are not precise enough to derive strong conclusions we can tentatively distinct four groups. Hungary is the country with the highest real wage flexibility. A second group comprises the Czech Republic, the Netherlands and probably the United Kingdom. Belgium, France, Germany, Italy and Poland can be regarded as a third group, where real wage flexibility is lower than in the preceding groups. Denmark, Portugal and Spain form a subgroup with low macroeconomic wage flexibility. Finally, as already mentioned the Slovak Republic stands out as the country where wage growth is not responsive to unemployment at all. These conclusions are based on the unemployment coefficients estimated on the basis of the two groups (CEEC4 and EU9 separately). The estimates turn out to be fairly stable when the two subsamples are merged into one. The only countries that are affected are Denmark and Portugal, where the coefficient on unemployment increases (in absolute value), and the UK where the wage responsiveness to unemployment is estimated to be lower. Focusing on the position of CEEC4, a clear distinction therefore emerges between Hungary and the Czech Republic, with relatively high real wage flexibility, and Poland and the Slovak Republic where wages are much less or not responsive to unemployment. The last two countries are also those with the highest unemployment rates.

With respect to the Slovak Republic this broadly coincides with the position of this country on institutional rigidity (Table 8). Although the overall institutional rigidity indicator for the Slovak Republic coincides with the average of the countries in the sample, it is clearly the highest of the CEEC4.

Table 9. Wage equations, dependent variable $\Delta(w_t - pc_{t-1})$.

	CEEC4	EU9	All
<i>Const.</i>	-0.0125 (0.0404)	-0.6856*** (0.1479)	-0.0153 (0.0208)
$\Delta\Delta pc_t$	0.8359*** (0.1914)	0.6138*** (0.1296)	0.8143*** (0.0954)
$\Delta\Delta pc_t * CE$ dummy			
$\Delta p_t - \Delta pc_t$	0.4466 (0.3937)	0.0882 (0.1776)	0.3892** (0.1818)
ΔZ_t	1.1626*** (0.3808)	0.5095*** (0.0970)	0.4524** (0.1796)
$\Delta Z_t * CE$ dummy			0.7124*** (0.2653)
$w_{t-1} - pc_{t-1} - Z_{t-1}$	-0.0088 (0.0083)	-0.1534*** (0.0317)	-0.0093** (0.0044)
u_t :			
Czech Republic	-0.4833 (0.3960)		-0.4806*** (0.1470)
Hungary	-0.8076** (0.3240)		-0.8096*** (0.1260)
Poland	-0.3433* (0.1799)		-0.3450*** (0.0748)
Slovak Republic	0.0430 (0.3690)		0.0625 (0.2030)
Belgium		-0.4363*** (0.0744)	-0.3041** (0.1194)
Denmark		-0.1929* (0.1021)	-0.3762** (0.1585)
France		-0.3528*** (0.0564)	-0.2823*** (0.0927)
Germany		-0.4730*** (0.0817)	-0.4216*** (0.1342)
Italy		-0.4000*** (0.0578)	-0.3066*** (0.0938)
Netherlands		-0.6239*** (0.1114)	-0.5140*** (0.1882)
Portugal		-0.1755* (0.1056)	-0.2872 (0.1782)
Spain		-0.1169*** (0.0410)	-0.1764*** (0.0658)
UK		-0.6804*** (0.1158)	-0.2916** (0.1403)
Observations	43	122	165
Adj. R ²	0.3903	0.5141	0.4410
DW	1.9488	1.6389	1.8946

Notes: Standard errors in brackets, *, ** and *** statistically significant at 90, 95 and 99 per cent respectively.

6. Conclusions

The political and economic reforms in the beginning of 1990s resulted in high open unemployment and low employment in the Central and Eastern European countries. While in the meantime the depressed economies of the CEECs have recovered and economic growth exceeds the average growth of the incumbent EU members, high unemployment still remains a major problem.

Inflexible and costly labour market institutions have often been held responsible for weak labour market performance in a number of OECD countries. In this paper we therefore assess the possibility that rigid labour market institutions might contribute to the unemployment problem in the CEECs. We showed that on average institutions are more flexible in the CEEC4 than in the EU9, except for active labour market policies and taxation of wages. Estimations of the wage Phillips curve also showed that wages are more responsive to unemployment than in most EU countries, except for the United Kingdom. The Slovak Republic, however, is an exception to this finding, Slovak wages being completely unresponsive to unemployment. This is especially worrisome as Slovakia, contrary to the other CEEC4 countries plans to enter EMU already at the beginning of 2009.

Although these insights to some extent explain the different labour market performance in Hungary and the Czech Republic, at one side, and Poland and the Slovak Republic, at the other side, they do not tell the full story. Our conjecture is that transition in the CEECs is still not fully completed and that high unemployment will continue to be part of the transformation process for a number of years to go.

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