Firm-level Consequences of Large Minimum-wage Increases in the Czech and Slovak Republics

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Abstract. After an initial decline in the level of real minimum-wage rates, there were series of unusually large increases in their levels — 70 and 50 per cent — during the years 1999–2002 in the Czech and Slovak Republics, respectively. Using information from matched employee–employer data sets, we look at the impact of minimum-wage hikes on both wages and employment. Our results suggest that there are some, but not substantial, job losses in reaction to minimum-wage hikes and that the impact on firm wages is rather large, implying that further increases of similar magnitude might very well have negative consequences for employment.

1. Introduction

In this paper, our intention is to examine the consequences of minimum-wage increases on employment and distribution of wages in two transitional economies: the Czech and Slovak Republics. After an initial decline in the level of real minimum-wage rates, in

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both countries there were series of unusually large increases in their levels during the years 1999–2002. Thus, in the Czech Republic the nominal minimum wage increased by 35.8, 25, 11.1 and 14 per cent in the years 1999, 2000, 2001 and 2002, respectively. Corresponding figures for the Slovak Republic in 1999, 2000, 2001 and 2002 were 20, 22.2, 11.8 and 13.2 per cent, respectively. This is not the end of story, however, as for the Czech Republic there was another 9 per cent increase in the minimum wage from 1 January 2003, and the current government wants to raise the minimum wage up to 50–60 per cent of the average wage by the year 2006. Not surprisingly, these legislative steps have generated a heated debate among policy makers and economists about the effects of minimum wages on employment, skill formation and growth during a period of persistent increases in the unemployment rate. But so far, to the best of our knowledge, empirical evidence on the actual consequences of these significant changes has been lacking.

The effects of minimum-wage increases are part of the perennial controversies in economics. Models for competitive markets predict that minimum-wage hikes lead to employment decreases. However, in the monopsony case higher wages may enable the firm to employ more workers as the firm moves up along its labour supply curve. Owing to the influential book by Card and Krueger (1995) in which, contrary to the accepted wisdom, they report findings of positive employment effects of minimum-wage hikes, the monopsony case and models with monopsonistic features have gained some renewed interest. Manning (2002) argues that the local labour markets are 'thin' from the perspective of individual workers and that economists in their analyses should pay more attention to the possibility that the companies operate as having monopsony power. He presents evidence on workers' commuting patterns that suggests that local labour markets are indeed 'thin' in the geographical dimension.

Increases in employment are possible also if, as in the cases of the Czech and Slovak Republics, the minimum-wage hikes occur in a situation where the minimum wage is close to the level of subsistence wage and there are weak incentives for minimum-wage earners to work. This is because then the minimum-wage hikes may increase the motivation to work. In addition to *employment effects*, changes in the minimum wage may also lead to shifts in the entire wage distribution, or in portions thereof; see, for example, Grossman (1983). This less studied effect, which may of course further magnify the employment effects, may be of some importance in the Czech and

Slovak Republics as both countries have a wage tariff system in which the lowest tariff wage rate equals the minimum wage. Increases in the latter shift the tariff scale and are thus likely also to affect wages above the minimum wage.

Most previous studies have been concerned with fairly small minimum-wage increases, implying difficulties in distinguishing the employment effects of minimum-wage hikes from other factors. For the same reason, furthermore, it may also be difficult to unearth effects (if any) on the wage distribution. There are, however, two notable exceptions in the recent literature: the studies by Castillo-Freeman and Freeman (1991) and Rama (2001), which look at the consequences of large and unforeseen minimum-wage hikes in Puerto Rico and Indonesia, respectively.

Hence, one of the contributions of this paper is to add one additional piece of evidence from a case with large minimum-wage increases. Another is that we consider two transitional economies for which research on these matters is relatively scant. A third novel feature of this paper is that we make use of information from a fairly large linked employee–employer data set, which allows us to test for whether the impact of minimum-wage hikes on employment and the wage distribution differs across firms, regions and industries. This is potentially interesting since firms, regions and industries differ with respect to factors like skill levels or firm size, and comparisons of the differences in the impact may thus shed some light on the relevance of the competitive versus monopsony models. Another reason why differences between firms are interesting is the key role played by new privately owned and typically small firms in the marketization process in transition economies.

The following section of this paper describes development of the minimum wage in the Czech and Slovak Republics in detail and provides additional information on those countries. The third section provides short theory and literature overviews, and Section 4 contains the data description. Here we address the question of whether the minimum wage actually bites and we look at the extent to which this differs across the two countries. Section 5 presents results from the econometric analysis. First we look at the impact on wages and the wage distribution. This is followed by an analysis of the employment consequences. All analyses are made at the level of the firm. We carry out both analyses of firms *in general* and of the wages and employment in firms *according to size and ownership type*. Section 6 offers some concluding remarks.

2. The development of minimum wages in the Czech and Slovak Republics

In 1992, after 75 years as a common state, Czechoslovakia was split into two independent nations, the Czech and the Slovak Republics, respectively. Until that date, the two republics shared the same currency, legal system, institutional framework and the first steps in transforming the economy towards capitalism. Following this 'velvet divorce' of Czechoslovakia, the countries have chosen quite different paths of economic development.

The macroeconomic indicators in Table 1 show that after the initial decline in GDP during the first 3 (4) years of transition in the Czech (Slovak) Republic, both economies started to grow rapidly. In the Czech Republic, several years of strong economic growth were interrupted by an exchange rate crisis in 1997, which was followed by an economic recession. Real GDP declined by 2.7 percentage points in 1998 and the recession continued in 1999, accompanied by a rapid slowdown in inflation.

In 2000, the Czech economy started to grow again. One of the main reasons for the 1997 crisis was the strong growth in real wages. For most of the early transition years, wage growth in the Czech Republic exceeded growth in labour productivity (see Table 2). Prior to 1997, the Czech unemployment rate stayed below 4 per cent, a considerably lower level than in the other post-communist countries in Central Europe (as well as in most EU countries). Until recently, the Czech Republic's labour market was therefore characterized as a 'miracle' by numerous observers. After the recession in 1997, however, the situation deteriorated and by the end of 1999 the Czech unemployment rate had reached 9.4 per cent. At the same time, there are large economic differences between the regions (Fidrmuc, 2001; Pytlikova, 2002).

Development in the Slovak Republic has been rather different. After an initial economic decline in 1993 as a result of the separation, which led to loss of trade and fiscal revenues, Slovakia started to grow. However, this growth was achieved chiefly through extensive government spending which proved to be too generous and eventually resulted in growing external debt. At the same time, the Slovak National Bank pursued tight monetary policies[1] to offset fiscal spending, which led to further slowing of economic growth.

Moreover, the lack of effective bankruptcy procedures, the non-transparent privatization process and the introduction of revitalization programmes for selected enterprises revealed difficulties

Table 1. Macroeconomic development in the Czech and Slovak Republics: 1991–2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Czech Republic											
GDP annual growth at 1995 const. prices	−11.5	−3.3	0.1	2.2	5.9	4.3	−0.8	−2.2	−0.4	3.0	3.3
Inflation rate	56.6	11.1	20.8	10.0	9.1	8.8	8.5	10.7	2.1	3.9	4.7
Unemployment rate	4.1	2.6	3.5	3.2	2.9	3.5	5.2	7.5	9.4	8.8	8.5
Slovak Republic											
GDP annual growth at 1995 const. prices	−14.6	−6.5	−3.7	4.9	6.7	6.2	6.2	4.4	1.9	2.2	3.0
Inflation rate	61.2	10.1	23.2	13.4	9.9	5.8	6.1	6.7	10.5	12.1	7.6
Unemployment rate	—	—	12.2	14.8	13.1	12.8	12.5	15.6	19.2	18.6	19.5

Source: Czech and Slovak Statistical Offices.

Table 2. The development of minimum-wage and other labour market measures in the Czech and Slovak Republics: 1993–2001

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Czech Republic									
Minimum wage (CZK)	2,200	2,200	2,200	2,500	2,500	2,650	3,250 3,600[b]	4,000 4,500[b]	5,000
Increase (per cent)	0.0	0.0	0.0	13.6	0.0	6.0	22.6 10.8[b]	11.1 12.5[b]	11.1
Real MW 1994 = 100	2,444	2,200	2,016	2,104	1,941	1,858	2,473	3,000	3,132
Net MW (CZK)	1,903	1,903	1,903	2,188	2,188	2,319	3,114	3,783	4,184
Minimum subsistence wage (CZK)	1,960	2,160	2,440	2,890	3,040	3,430	3,430	3,770	3,770
MW ratio as percentage of gross average earnings	37.8	31.9	26.9	25.8	23.4	22.7	25.7 28.4[b]	29.7 33.4[b]	36.3
Labour productivity growth	1.7	1.4	3.3	3.7	1.1	–0.6	3.2	5.1	3.9
The growth of gross average earnings	3.7	7.7	8.6	8.8	1.9	–1.1	6.0	2.6	2.2
Slovak Republic									
Minimum wage (SKK)	2,200	2,450	2,450	2,700	2,700	3,000	3,600	4,000 4,400[a]	4,400 4,920[a]
Increase (per cent)	0.0	11.4	0.0	10.2	0.0	11.1	20.0	11.1 10.0[a]	11.0 8.0[a]
Real MW 1994 = 100	1,983	2,126	2,126	2,268	2,316	2,550	2,734	3,088	3,404
Net MW (SKK)	2,126	2,126	2,126	2,316	2,316	2,550	3,063	3,484	3,785
Minimum subsistence wage (SKK)	1,700	1,700	1,980	2,180	2,180	2,410	3,000	3,000	3,230
MW ratio as percentage of gross average earnings	40.9	38.9	34.1	33.1	29.3	30.0	33.6	32.6 35.9[a]	36.0 40.2[a]

Note: [a] Changes as from 1 October. [b] Changes as from 1 July.
Source: Czech and Slovak Statistical Offices; own calculations.

with the restructuring of enterprises. In many cases, privatized businesses have unclear ownership status, and in general firms' profitability has been low.[2] Thus, economic growth was not translated into employment growth. Rather, there was a strong reduction in total employment, which declined both in absolute terms and relative to the working-age population. As a consequence, unemployment has remained high since the beginning of the 1990s, varying between 13 and 14 per cent during most of the decade (see Table 1). In 1998, unemployment started to increase again and by the end of 2001 it had reached 19.5 per cent. In addition, the regional disparities in Slovakia are large, resulting in especially high unemployment rates in areas dominated by heavy industry and agriculture.

2.1 Minimum wages

Minimum wages were first introduced in the 1991 Minimum Wage Act. The minimum-wage rate was uniform for all employees across the country and was given on an hourly and monthly basis. During the period from 1991 to 1993 it was changed only once, by 10 per cent (from CZK2,000 to CZK2,200 in 1992).

Following the split of Czechoslovakia, the economies have followed different minimum-wage development paths, although both took over the previous common legislature. In both countries, the minimum-wage parameters are set by law following preliminary discussions within a tripartite body and are supposed to reflect changes in the development of the average wage, the subsistence wage and inflation. In the early transition years there were very few changes in the level of the minimum wage in both economies, one of the main reasons being the weakness of the trade unions.[3] The other was the fact that the minimum wage constituted the basis for the determination of many social benefits, such as health and pension insurance and unemployment benefits. Since parts of the state payments to the social system were derived from minimum-wage levels, governments had an obvious interest in maintaining minimum-wage rates. However, this situation changed during the second part of the 1990s.

In the Czech Republic, most of the above-mentioned links were transferred to the subsistence wage in 1998.[4] The Czech government's objective was to increase the minimum wage to 15 per cent above the level of the subsistence wage, and its long-term goal was to increase it further to at least 50 per cent of the average gross

wage. Consequently, the minimum-wage rate began to increase regularly in half-yearly intervals up to January 2003. The minimum wage to average earnings ratio rose from 22.7 per cent in 1998 to the current 39 per cent.

As another result of this process, in 1999 real minimum wages had returned to the same level as in 1993. Looking at the relation of minimum-wage development to the subsistence wage, we can also observe the paradox that occurred in the Czech labour market: for seven years the net minimum wage did not exceed the subsistence wage. Consequently, the incentives for the unemployed to accept low-paid jobs were weak. Also, the current level of the minimum wage weakens the incentives for unskilled labour to seek employment.

Prior to 1999, in the Slovak Republic, the levels of most of the social benefits such as health and pension insurance and unemployment benefits were tied to the minimum wage. The real minimum wage declined as the nominal minimum wage clearly lagged behind that of nominal wages and consumer prices. Since 1999, the benefits have been linked to the subsistence wage[5] and the minimum wage has been growing rapidly, as can be seen from Table 2. Despite the series of increases in the minimum wage between 1994 and 2001 in the Slovak Republic, the minimum to average wage ratio is still about the same as in 1993 (40.2 per cent).

Both Czech and Slovak Republics took over the 1991 Minimum Subsistence Amount Act which guarantees individuals or their household a given minimum level of income, called the subsistence wage. If the income from work (net of taxes), property, sickness benefits or pensions is less than the subsistence wage, the state pays the remaining income.[6] Thus, people can obtain the subsistence wage irrespective of whether or not they work. During the second half of the 1990s the net minimum wage in the Czech Republic was for several years actually lower than the subsistence wage. Consequently, the incentives to accept low-paid job offers were weak.

In both the Czech and the Slovak Republics employers pay a payroll tax of 35 and 38 per cent, respectively, for pension, sickness, unemployment, and health insurance. The employees' social security contributions amount to 12.5 and 12 per cent, respectively. Hence, increases in these benefits may affect employers' wage costs quite significantly.

Both countries have a so-called minimum-wage tariff system. Minimum-wage tariffs represent differentiated minimum rates, which depend on the complexity, responsibility of the job and the

skills required of the employee. The employer ranks the employee within the appropriate wage tariff on the basis of a comparison of the work type agreed in the employment contract with generally binding characteristics of wage tariffs. The lowest wage tariff is logically equal to the level of the minimum wage. However, employers can apply their own system with fewer tariff wage rates (or also without tariff wage rates, as in small enterprises for example). But they can only apply the system in such a way that the employee's total wage is at least equal to the amount of the minimum-wage rate specified for the type of work he/she is doing. The wage tariffs are important, as increases in the minimum wage automatically shift wages up through the tariff scale. Thus, for instance, in the recent collective agreements for 2003 between the employers' associations and the unions in the energy sector and in the mining industry the parties have agreed to continue to explicitly tie changes in the wage tariffs to changes in the minimum wage. The development of the wage tariffs is shown in Table 3.

During 1993–95 there was a 12-tariff wage system in the Czech Republic. As from the beginning of 1996 the number of tariff levels was reduced to three. However, this three-level system did not ensure sufficient differences in wages in relation to skills and the difficulty of the job, and therefore the government decided to change the system and reintroduced the 12-tariff system as from 2000.

In the Slovak Republic, there has been a 12-level wage tariff system during the whole transformation period without any changes in the system. The tariffs have been increased in the same way as the levels of minimum wage (see Table 3).

3. Previous research

The effects of minimum-wage increases constitute one of the many ongoing controversies in economics. The traditional view on minimum-wage increases stems from the basic competitive labour market model in which employers face a perfectly elastic labour supply curve. According to this model, any increases in wages would result in lay-offs of employees. Thus, the prediction is clear: employment will decrease. However, the competitive model is based on many simplifying assumptions, which may not be valid in real economies. One of them is homogeneity of the workforce. In reality, individuals differ in terms of skills, education, age, and work experience. Another frequently adopted assumption is that individuals

Table 3. Development of minimum wage tariffs in the Czech and Slovak Republics, monthly wage: 1998–2000

	Czech Republic (CZK)					Slovak Republic (SKK)			
Stage	**1.1.1998**	**1.1.1999**	**1.7.1999**	**1.1.2000**	**1.7.2000**	**1.1.1998**	**1.4.1999**	**1.1.2000**	**1.10.2000**
1				4,000	4,500	3,100	3,600	4,000	4,400
2				4,150	4,650	3,240	3,750	4,170	4,590
3	2,650	3,250	3,600	4,350	4,900	3,380	3,920	4,360	4,800
4				4,600	5,200	3,530	4,110	4,570	5,030
5				4,900	5,500	3,720	4,330	4,810	5,290
6				5,250	5,900	3,950	4,580	5,090	5,600
7	3,300	4,050	4,500	5,650	6,350	4,210	4,870	5,410	5,950
8				6,100	6,850	4,500	5,210	5,790	6,370
9				6,600	7,400	4,810	5,600	6,220	6,840
10				7,200	8,100	5,200	6,050	6,730	7,400
11	4,600	5,650	6,300	8,000	9,000	5,640	6,560	7,290	8,020
12				9,000	10,100	6,150	7,150	7,950	8,740

Source: Ministry of Labour and Social Affairs in the Czech and Slovak Republics.

have perfect information about job opportunities. When changing some of these assumptions, it is clear that the labour supply curve is not perfectly elastic (see Bhaskar *et al.*, 2002; Manning, 2002, 2003; Zavodny, 1998, for detailed discussions of how the predictions are modified).

The alternative view in minimum-wage discussions is that of monopsonistic markets, with the sole employer in the labour market exemplifying the extreme case of monopsony. According to the model's predictions, the minimum-wage hikes may increase employment, since the higher wage enables the monopsonistic firm to hire additional workers as the firm moves up along its labour supply curve. The traditional monopsony model is nevertheless rather unrealistic, as there is rarely only a single employer in the market. There are, however, many possible situations between the extremes of perfect competition and pure monopsony, such as oligopsony and monopsonistic competition (see Bhaskar *et al.*, 2002, for a survey).

All this is in line with the perception of labour markets as 'thin' (Manning, 2003). In reality, there is not usually just a single labour market but rather many local labour markets within a geographical area. Such a perception of the labour market indicates that workers are not faced with many potential employers within a reasonable distance.

The fact that some firms may operate in a labour market with employers having some monopsony power over their workers could explain the finding in some recent studies that minimum-wage hikes have the effect of increasing employment. It is important to note that all the above-mentioned models predict that high minimum wages will reduce employment. In the countries studied in the current paper, the levels of minimum wages are low, but on the other hand the changes therein are large.

According to theory, changes in the minimum wage may also lead to shifts in the wage distribution. An increase in the minimum wage not only raises wages for low-wage workers who remain employed, but the wage effects also 'spill over' to workers above (or below) the new minimum wage. This raises concerns about the impact of the forthcoming minimum-wage increase on wages, and ultimately price inflation (see, for example, Grossman, 1983). This less-studied effect may, of course, further magnify the employment effects.

As regards the empirical evidence of the relationship between minimum-wage increases and employment, a large body of empirical literature has built up, particularly for the USA. In line with the

traditional theoretical approach, many studies have found that minimum-wage hikes indeed lead to employment decreases (Brown, 1988; Brown *et al*., 1982; Currie and Fallick, 1996; Deere *et al*., 1995; Kim and Taylor, 1995; Neumark and Wascher, 1992, 1994; Wellington, 1991). Until recently, there was more or less a consensus about their direction and the discussion was concerned mainly with the magnitude of the effects. However, the discussion has intensified and changed character following the controversial findings of Card (1992a, b), Katz and Krueger (1992), Card and Krueger (1994, 1995), according to which minimum wages are associated with either no change in employment or even increases in employment levels. Although these studies have met strong criticism in relation to problems with possible measurement errors and overall problems with quasi-experiments, they have also pointed out several weaknesses in the earlier literature and hence led to a resurgence of interest in the issue and in finding new testing grounds.

It should be noted that the magnitude of minimum-wage increases in the USA has typically been rather small. Moreover, the increases have been infrequent and the coverage incomplete, all of which makes it difficult to distinguish between effects from minimum-wage changes and from other changes. Also in the case of EU countries, there has been no big change in minimum-wage levels and their experiences offer no better opportunities for minimum-wage research (cf. Dolado *et al*., 1996). An additional complication is the possible endogeneity of minimum-wage increases because increases take place during periods of high growth, thereby giving rise to a positive relationship between minimum wages and employment growth (see Neumark and Wascher, 1992, 1994). However, this is not the case in the Czech and Slovak Republics, as the large hikes occurred during years of stagnating employment.

There are, however, a few studies that merit attention. Abowd *et al*. (1999) examined the changes of the real minimum wage and the subsequent employment outcomes in France and the USA using micro-data sets similar to those in our study. They found that increases in the minimum wage in France decreased the probability of future employment. This is contrary to previous French studies that have been based on aggregate time-series data and have found no dis-employment effect of minimum-wage hikes. Abowd *et al*. estimate the conditional elasticity of subsequent employment as a function of the real minimum wage to be –3.2 for 26–30-year-old French men and –4.3 for men in the 31–35 age group.

A new source of European evidence is provided by the lively debated introduction of the minimum wage in the UK in 1999. Two recent studies have looked at its consequences.[7] Stewart (2002) used longitudinal data and a difference-in-differences estimator to find no significant adverse employment effects for any of the four demographic groups (youth, adults, men and women) considered in the paper. Machin *et al*. (2002) made use of data collected from the residential care homes sector, which is a non-unionized low-pay sector, and consequently likely to be affected by the new legislation. They found a considerable compression of wages at the lower end of the distribution plus some employment-reduction effects.

Two studies that are particularly interesting from the perspective of the current paper are the analysis of large and unforeseen minimum-wage increases in Puerto Rico and Indonesia by Castillo-Freeman and Freeman (1991) and Rama (2001), respectively. Castillo-Freeman and Freeman (1991) examined the effects of extending the US minimum wage to the Puerto Rican labour market in the late 1970s and early 1980s. They show that this minimum-wage increase had a substantial negative impact on employment in Puerto Rico, not because the minimum-wage elasticity of employment was high, but as a consequence of the large change in the minimum wage to average wage ratio.[8]

Rama (2001) estimated the effect of doubling the real minimum wage on employment and wage earnings in Indonesia. He found that this extraordinary large minimum-wage hike led to an increase in average wages in the range of 5–15 per cent and a decrease in urban employment in the range of 0–5 per cent. Moreover, he demonstrates that the employment effects vary considerably by firm size; small firms experience substantial decreases in employment, whereas large companies in some cases actually increase their workforce.

Minimum-wage developments in the post-communist Eastern European countries provide a unique possibility to examine the impact of minimum wages and changes therein. And yet, to the best of our knowledge, until now there has been no detailed study on the effects of minimum wages on the labour markets in transition economies.[9]

4. Data description

This study is based on a data set derived from a national survey on labour costs known as the Average Earnings Information System

(AEIS) which matches firms and workers. The data set has relatively rich information about both the workers and their employers. The data have been collected on a quarterly basis by a private consulting company, Trexima Ltd, on behalf of the Czech and Slovak Ministries of Labour.

The firms are legally obliged to supply Trexima with information in two files. The first one contains information on the following employer characteristics: location, industry, legal settings, type of ownership (private, state, foreign, etc.), size, etc. The second file includes worker characteristics such as age, gender, occupation, education, work experience in years and tariffs grade.

In this paper we use data from the fourth quarter of the years 1998–2000 for both the Czech and Slovak Republic. We analyse data on 1,049,582 employees in the Czech Republic and 295,210 employees in the Slovak Republic in 1998. As regards year 2000, we have information on 1,056,724 and 345,391 employees in the Czech and Slovak Republics, respectively. For further description of the data, see Kala (2002).

When examining the characteristics of minimum-wage workers, it is useful not to look exclusively at those workers earning exactly the minimum wage but to consider a somewhat broader range. We adopt two alternative definitions; firstly, we define 'minimum-wage workers' as workers earning 10 per cent above the minimum-wage level or less. Secondly, we adopt the definition of 'low-wage workers' used by, for example, the OECD: two-thirds of the median wage of all wage earners.

Tables 4 and 5 provide some descriptive statistics on minimum- and low-paid workers in the Czech and Slovak Republics in the years 1998 and 2000. Compared with the overall labour force, low-paid workers are clearly over-represented among females, youth and young adults. As many as nearly half of these categories belong to the low paid. The share of low-paid employees decreases with education. Low-paid workers are most likely to be employed in the sales, agriculture, hotels and restaurants and public administration sectors. In both countries, low pay is not concentrated in particular regions.

One obvious fact borne out by Tables 4 and 5 is that minimum wages in the Czech and Slovak Republics are *not* binding in the conventional sense. Only a tiny proportion of Czech wage earners receives minimum wages (less than 1 per cent). The share is very low in the Slovak Republic, too. However, in both countries the proportion has almost quadrupled in the late 1990s.

Table 4. Characteristics of minimum-wage (MW) and low-wage workers (LW), percentage of all MW, LW and total workers and percentage of each category, Czech Republic: 1998 and 2000

Characteristics	1998			2000		
	MW workers	LW workers	Total	MW workers	LW workers	Total
Employment	643	174,542	1,044,640	3,066	170,230	1,056,724
Share of total (per cent)	0.06	16.71	100	0.29	16.11	100
Gender (per cent)						
Men	31.73	23.14	51.34	34.47	30.80	54.76
Women	68.27	76.86	48.66	65.53	69.20	45.24
Age (per cent)						
Youth (<19)	6.22	3.36	0.83	2.71	1.22	0.27
Young adults (19–24)	19.75	16.55	11.89	12.82	15.68	9.51
Adults	74.03	80.09	85.25	84.47	83.09	90.22
Education (per cent)						
Primary school	17.11	15.90	6.13	1.08	0.67	0.26
Lower secondary school	39.19	38.43	34.58	40.61	31.04	14.66
Secondary school	9.18	13.37	24.6	49.61	59.21	64.2
Industry (NACE) (per cent)						
Agriculture, forestry	2.80	4.33	2.73	13.99	8.49	2.46
Processing industry	40.75	22.25	25.19	23.68	23.92	7.99
Trade, wholesale, repairs	9.64	7.68	4.03	10.18	9.32	2.51
Hotels & restaurants	3.11	2.29	0.89	2.25	1.78	0.45
Public and Social Services	3.27	1.83	1.47	7.18	3.57	0.95
Type of ownership (per cent)						
Private	34.21	24.32	26.01	41.94	41.30	36.16
Cooperative owned	26.28	7.04	2.65	30.46	9.42	3.19
State owned	23.95	43.48	35.03	12.23	26.65	31.05
Foreign[a]	0.31	6.62	3.46	2.28	5.60	4.39

Table 4. Continued

Characteristics	1998			2000		
	MW workers	LW workers	Total	MW workers	LW workers	Total
Percentage of each category						
Gender (per cent)						
Men	0.04	7.53	100	0.18	9.06	100
Women	0.09	26.39	100	0.42	26.39	100
Age (per cent)						
Youth (<19)	0.46	67.32	100	2.94	73.73	100
Young adults (19–24)	0.10	23.26	100	0.39	26.57	100
Adults	0.05	15.70	100	0.27	14.84	100
Education (per cent)						
Primary school	0.17	43.33	100	1.20	41.25	100
Lower secondary school	0.07	18.56	100	0.80	34.11	100
Secondary school	0.02	9.09	100	0.22	14.85	100
Industry (NACE) (per cent)						
Agriculture, forestry	0.06	26.47	100	1.65	55.67	100
Processing industry	0.10	14.76	100	0.86	48.21	100
Trade, wholesale, repairs	0.15	31.85	100	1.18	59.73	100
Hotels & restaurants	0.22	42.93	100	1.45	63.97	100
Public and Social Services	0.14	20.89	100	2.19	60.55	100
Type of ownership (per cent)						
Private	0.08	15.63	100	0.34	18.40	100
Cooperative owned	0.61	44.44	100	2.77	47.65	100
State owned	0.04	20.74	100	0.11	13.83	100
Foreign[a]	0.01	31.99	100	0.15	20.57	100

Note: [a] Foreign share: more than 50 per cent.
Source: Own calculations.

Table 5. Characteristics of minimum-wage (MW) and low-wage workers (LW), percentage of all MW, LW and total workers and percentage of each category, Slovak Republic: 1998 and 2000

Characteristics	1998			2000		
	MW workers	LW workers	Total	MW workers	LW workers	Total
Employment	1,134	45,384	295,210	3,350	45,384	345,391
Share of total (per cent)	0.38	15.37	100	0.97	15.18	100
Gender (per cent)						
Men	34.22	31.98	60.62	31.22	29.76	55.09
Women	65.78	68.02	39.38	68.78	70.24	44.91
Age (per cent)						
Youth (<19)	14.46	7.73	2.29	2.97	2.19	0.60
Young adults (19–24)	17.11	15.01	11.93	19.83	17.87	10.92
Adults	68.43	77.27	85.78	77.20	79.93	88.48
Education (per cent)						
Primary school	17.11	16.28	8.10	14.68	13.69	6.51
Lower secondary school	46.38	40.03	37.42	34.39	39.51	34.46
Secondary school	9.26	18.87	31.09	19.62	22.02	32.65
Industry (NACE) (per cent)						
Agriculture, forestry	6.70	8.46	4.70	—	—	—
Processing industry	44.10	30.90	27.90	—	—	—
Trade, wholesale, repairs	12.30	9.60	4.90	—	—	—
Hotels & restaurants	0.97	1.21	0.49	—	—	—
Public and Social Services	4.76	5.02	2.13	—	—	—
Type of ownership (per cent)						
Private	53.44	48.59	43.82	40.20	42.26	40.93
Cooperative owned	25.75	12.98	5.74	10.75	7.40	3.94
State owned	7.32	26.54	41.36	31.64	30.92	37.72
Foreign[a]	1.06	3.17	2.06	8.54	7.93	8.68

Table 5. Continued

Characteristics	1998			2000		
	MW workers	LW workers	Total	MW workers	LW workers	Total
Percentage of each category						
Gender (per cent)						
Men	0.22	8.11	100	0.55	8.20	100
Women	0.64	26.56	100	1.48	23.74	100
Age (per cent)						
Youth (<19)	2.43	51.88	100	4.78	55.48	100
Young adults (19–24)	0.55	19.33	100	1.75	24.83	100
Adults	0.31	13.85	100	0.84	13.71	100
Education (per cent)						
Primary school	0.81	30.89	100	2.18	31.93	100
Lower secondary school	0.48	16.45	100	0.96	17.40	100
Secondary school	0.11	9.33	100	0.58	10.24	100
Industry (NACE) (per cent)						
Agriculture, forestry	0.55	27.66	100	—	—	—
Processing industry	0.61	16.94	100	—	—	—
Trade, wholesale, repairs	0.96	30.29	100	—	—	—
Hotels & restaurants	0.75	37.75	100	—	—	—
Public and Social Services	0.86	36.14	100	—	—	—
Type of ownership (per cent)						
Private	0.47	17.05	100	0.95	15.67	100
Cooperative owned	1.72	34.79	100	2.64	28.50	100
State owned	0.07	9.87	100	0.81	12.44	100
Foreign[a]	0.20	23.59	100	0.95	13.87	100

Note: [a] Foreign share: more than 50 per cent.
Source: Own calculations.

The minimum wage (in Czechoslovakia) was initially set at a level comparable with that in many capitalist economies. However, minimum wages fell substantially in real terms (in the Czech Republic they fell by about 50 per cent during the years 1992–96). There was a curious situation in the Czech Republic between 1993 and 1999 in that the net minimum wage was below the minimum subsistence wage. In such a situation, minimum-wage earners lack incentives to work. As the minimum wage again exceeded the subsistence wage in the late 1990s, this created stronger motives for employees to work and to supply more hours. Even if the level had not fallen so dramatically, minimum wages would probably not have been effective anyway, as in the early transition years the authorities lacked the resources to enforce them.

This does not mean, however, that minimum wages have had no role to play. As we have seen, in the Czech and Slovak Republics the minimum wage constitutes the base level in the scale of minimum-wage tariffs and thus an increase in it shifts the other tariff wage rates and also, therefore, actual wages. During the period under study, 50 (60) per cent of the firms and 608,635 (238,799) of the employees in the Czech (Slovak) Republic have applied the minimum-wage tariff system in their wage-setting rules. The remaining firms have applied their own systems, but the wages of their employees should equal at least the level of the relevant tariff wage rate. Consequently, when the minimum wages in the late 1990s were elevated to considerably higher levels, one can certainly not rule out the possibility that minimum wages have had a *direct* effect on wages, in particular those of low-paid workers, and hence on employment. The next section aims to provide some evidence on this.

5. Estimations of wage and labour demand effects

In order to examine the effects of the minimum-wage changes on changes in firms' wages and on their demand for labour, we have estimated, following Card (1992b), a simple regression model on firm-level data. As the minimum wages in both the Czech and Slovak Republics are national, we try to capture the effects on firms' wage costs by using a variable that shows the vulnerability of the firm to changes in the minimum wage.

The model for log wage changes is:

$$\Delta \ln W(j,t) = \alpha + \beta MWI(j,t-1) + \gamma X(j,t-1) + \varepsilon(j,t), \qquad [1]$$

where j denotes the firm, t is time, X is a vector of firm characteristics, MWI is explained below, and α, β and γ are estimable parameters. MWI is the key variable measuring the potential significance of minimum wages for the firms. We have used two different operationalizations of MWI. The first is the proportion of low-paid workers in the firm. Low pay is defined (admittedly as in the low-pay literature, somewhat arbitrarily) as two-thirds of the median pay of all wage earners (in our two samples). The second is a 'minimum-wage gap' as per Card (1992b): (10th decile limit — minimum wage)/minimum wage. In both cases we expect that the higher the MWI, the stronger the impact of minimum-wage changes on the firm's average wage. Note that in order to control for industry-, region- or firm-specific influences on wage growth, we include sets of indicators for industrial affiliation, geographical location and type of ownership.

The employment equation contains the same explanatory variables as [1]. Here we use two different dependent variables: the log difference in the number of employees in the firm and the log difference in the total number of hours worked in the firm. Because of the uniformity of the minimum-wage changes, the impact of the minimum-wage change varies across firms due solely to the pre-change level of wages. This means that it is implicitly assumed that if there were no minimum-wage changes then the changes in firm wages and the initial level of firm wages are unrelated. A similar assumption is made, of course, in the employment and hours equations regarding the relation between employment and hours changes and the initial level of firm wages. Unfortunately, we have no data for the sample firms from earlier periods, which would allow us to test or shed some light on the reasonableness of these assumptions.

Naturally, the employment and hours equations are reduced forms and a step towards a simple structural model is to use MWI as an instrument for wage changes in the equation; that is:

$$\Delta \ln E(j,t) = \chi + \phi \Delta \ln W(j,t) + \varphi X(j,t-1) + \omega(j,t) \qquad [2]$$

$$\Delta \ln W(j,t) = \alpha + \beta MWI(j,t-1) + \gamma X(j,t-1) + \varepsilon(j,t). \qquad [1]$$

In addition to employment and hours worked, we have also used the proportion of low-skilled workers in the firm as a dependent variable. The motivation for this is that when firms are forced to pay higher wages for low-skilled employees, they may consider hiring

more skilled workers instead. Thus, minimum-wage increases may not only change the level but also the composition of firms' workforces.

We have estimated equations [1] and [2] on all firms and subsamples consisting of profit and non-profit firms as well as firms with more and with fewer than 100 employees. The estimation results for the periods 1998–99 and 1999–2000 for the Czech and Slovak Republics, respectively, are displayed in Tables 6 and 7.[10]

Beginning with the estimates for the Czech Republic (see Table 6) we may note that in both periods, albeit with different strength, the larger the proportion of low-paid workers in a firm, the higher the increase in the firm's average wage.[11] According to the estimations for 1998–99, firms with a higher share of employees on low pay expanded their employment more than other firms, whereas the opposite is true for the period 1999–2000. The effect on hours worked in the firm is of negative sign for both periods. It should be noted that the average employment and total hours growth is negative in both periods: –14.4 and –5.1 per cent, and –5.1 and –5.4 per cent for employment and hours, respectively. The estimations employing the alternative minimum-wage gap variable tell roughly the same story. The larger the gap, the larger the effect on the firm's average wage. Employment and total hours in firms are unaffected by the minimum-wage increases in the first period and negatively affected in the second. One possible interpretation of these results is, of course, a 'monopsonistic' or 'thin labour market' interpretation. One should remember that the real minimum wage was below the subsistence wage and that increasing the former provided stronger incentives to work. But then one would expect that the working hours would react in the same manner, and not move in the opposite direction. Hence, we think the results are clearly more consistent with the notion of a competitive labour market.

The estimates for the Slovak Republic (see Table 7), which are based on substantially fewer observations, do also clearly show that the average wage of firms employing relatively many workers from the lower end of the wage distribution is raised more as a consequence of hikes in the minimum wage. For the Slovak Republic we find a negative effect on employment in the first period but no significant effect in the second period. The impact on hours is less precisely estimated and the estimates indicate, if anything, that the impact is positive in the second period. In both cases it should be noted that the number of observations in the second period is quite small.

Table 6. Effects of minimum-wage changes on firm average wages and firm employment,[a] Czech Republic: 1998–99 and 1999–2000

	Dependent variable									
	Δ ln firm average wage		Δ ln firm employment		Δ ln total hours		Δ ln in firm's proportion of workers with basic education		Δ ln in proportion of hours worked by workers with basic education	
	1998–99	1999–2000	1998–99	1999–2000	1998–99	1999–2000	1998–99	1999–2000	1998–99	1999–2000
Independent variable: proportion of low-paid employees in firm										
Regressions using the two-thirds of median pay variable as a definition of low pay										
Total	0.121***	0.053***	0.185***	–0.142***	–0.119***	–0.124***	0.103	–0.130	–0.014*	–0.036
No. of obs. (1,717; 1,844)	(0.017)	(0.014)	(0.046)	(0.036)	(0.040)	(0.038)	(0.138)	(0.097)	(0.017)	(0.028)
Profit firms	0.069***	0.059***	0.166***	–0.140**	–0.154***	–0.132***	–0.160	–0.060	0.009	–0.047*
No. of obs. (989; 1,199)	(0.024)	(0.018)	(0.053)	(0.045)	(0.055)	(0.047)	(0.129)	(0.108)	(0.023)	(0.034)
Non-profit firms	0.174***	0.016	0.135***	–0.143***	–0.114**	–0.136***	0.568**	–0.330**	–0.044*	–0.062
No. of obs. (728; 645)	(0.020)	(0.022)	(0.058)	(0.058)	(0.057)	(0.062)	(0.290)	(0.182)	(0.026)	(0.045)
Less than 100 employees	0.142***	0.086***	0.028	–0.122**	–0.149**	–0.117*	–0.268***	–0.063	–0.030	–0.043
No. of obs. (618; 669)	(0.028)	(0.026)	(0.061)	(0.064)	(0.060)	(0.065)	(0.117)	(0.045)	(0.027)	(0.043)
More than 100 employees	0.120***	0.036**	0.281***	–0.134***	–0.101**	–0.100**	0.349*	0.140***	0.001	–0.011***
No. of obs. (1,099; 1,175)	(0.022)	(0.018)	(0.055)	(0.045)	(0.056)	(0.050)	(0.220)	(0.165)	(0.024)	(0.039)
Regressions using the minimum-wage gap variable as a definition of low pay										
Total	0.059***	0.025***	–0.008	–0.036***	0.004	–0.027***	0.048	–0.055***	0.002	–0.024***
No. of obs. (1,782; 1,959)	(0.004)	(0.004)	(0.010)	(0.010)	(0.010)	(0.010)	(0.034)	(0.026)	(0.004)	(0.008)
Profit firms	0.058***	0.026***	–0.010	–0.041***	–0.008	–0.032***	0.022	0.043*	0.008*	–0.027***
No. of obs. (1,041; 1,300)	(0.006)	(0.005)	(0.013)	(0.011)	(0.013)	(0.012)	(0.029)	(0.027)	(0.005)	(0.009)
Non-profit firms	0.049***	0.006	–0.031*	–0.050***	0.012	–0.040**	0.135*	–0.083	–0.013*	–0.026*
No. of obs. (741; 659)	(0.006)	(0.007)	(0.018)	(0.020)	(0.018)	(0.021)	(0.087)	(0.060)	(0.008)	(0.015)
Less than 100 employees	0.055***	0.033*	–0.050***	–0.037***	–0.037**	–0.029**	0.002	–0.036***	–0.003	–0.030***
No. of obs. (661; 756)	(0.009)	(0.006)	(0.018)	(0.015)	(0.019)	(0.016)	(0.034)	(0.011)	(0.008)	(0.011)
More than 100 employees	0.062***	0.014***	0.004	–0.041***	0.020*	–0.027**	0.043	–0.051	0.002	–0.016
No. of obs. (1,121; 1,203)	(0.004)	(0.005)	(0.012)	(0.014)	(0.012)	(0.015)	(0.048)	(0.049)	(0.005)	(0.011)

Notes: [a] Controls included in the regressions are: 13 regional dummies, 13 industry dummies and 4 dummies for type of ownership; 10, 5 and 1 levels of confidence are indicated by *, ** and ***, respectively. Standard errors are in parentheses.

Table 7. Effects of minimum-wage changes on firm average wages and firm employment,[a] Slovak Republic: 1998–99 and 1999–2000

	Dependent variable									
	Δ ln firm average wage		Δ ln firm employment		Δ ln total hours		Δ ln in firm's proportion of workers with basic education		Δ ln in proportion of hours worked by workers with basic education	
	1998–99	1999–2000	1998–99	1999–2000	1998–99	1999–2000	1998–99	1999–2000	1998–99	1999–2000
Independent variable: proportion of low-paid employees in firm										
Regressions using the two-thirds of median pay variable as a definition of low pay										
Total	0.179***	0.852***	–0.108*	0.416	–0.075	0.543	0.039	–0.079	0.037	–0.086
No. of obs. (513; 119)	(0.038)	(0.303)	(0.040)	(0.619)	(0.080)	(0.641)	(0.042)	(0.198)	(0.054)	(0.198)
Profit firms	0.095**	1.346***	–0.146*	1.053	–0.099	1.001	0.066	–0.224	0.063	–0.228
No. of obs. (284; 62)	(0.047)	(0.394)	(0.087)	(0.973)	(0.097)	(0.991)	(0.053)	(0.297)	(0.097)	(0.297)
Non-profit firms	0.353***	0.216	–0.116	0.079	–0.054	0.247	–0.091	–0.128	–0.089	–0.138
No. of obs. (229; 57)	(0.064)	(0.492)	(0.134)	(0.897)	(0.141)	(4.365)	(0.069)	(0.283)	(0.069)	(0.283)
Less than 100 employees	0.193***	1.236*	–0.155*	–0.365	–0.108	–0.375	0.096*	–0.070	0.091*	–0.072
No. of obs. (206; 54)	(0.064)	(0.711)	(0.094)	(0.880)	(0.128)	(0.916)	(0.059)	(0.307)	(0.059)	(0.311)
More than 100 employees	0.178***	0.741**	–0.119	1.644*	–0.039	1.805**	–0.019	0.006	–0.017	–0.021
No. of obs. (307; 65)	(0.049)	(0.362)	(0.113)	(0.860)	(0.111)	(0.937)	(0.060)	(0.353)	(0.060)	(0.353)
Regressions using the minimum-wage gap variable as a definition of low pay										
Total	0.111***	0.269***	–0.038***	0.138	–0.010	0.250*	0.006	0.006	0.006	0.005
No. of obs. (550; 134)	(0.008)	(0.075)	(0.015)	(0.147)	(0.016)	(0.152)	(0.008)	(0.048)	(0.008)	(0.048)
Profit firms	0.046***	0.268***	–0.046**	0.155	–0.025	0.253	0.010	–0.001	0.009	–0.004
No. of obs. (312; 75)	(0.012)	(0.083)	(0.022)	(0.182)	(0.026)	(0.185)	(0.013)	(0.056)	(0.013)	(0.056)
Non-profit firms	0.147***	0.187	–0.036*	0.203	–0.009	0.118	–0.002	0.024	–0.003	0.025
No. of obs. (238; 59)	(0.009)	(0.254)	(0.021)	(0.487)	(0.021)	(0.508)	(0.010)	(0.152)	(0.010)	(0.153)
Less than 100 employees	0.129***	0.247*	–0.023*	0.229	–0.007	0.292	0.007	0.065	0.006	0.066
No. of obs. (238; 66)	(0.010)	(0.141)	(0.015)	(0.195)	(0.020)	(0.207)	(0.009)	(0.065)	(0.009)	(0.066)
More than 100 employees	0.085***	0.302***	–0.075***	0.442*	0.006	0.507*	0.005	–0.096	0.005*	–0.098
No. of obs. (312; 68)	(0.014)	(0.123)	(0.034)	(0.271)	(0.033)	(0.295)	(0.018)	(0.110)	(0.018)	(0.110)

Notes: [a] Controls included in the regressions are: 9 regional dummies, 13 industry dummies and 4 dummies for type of ownership; 10, 5 and 1 levels of confidence are indicated by *, ** and ***, respectively. Standard errors are in parentheses.

Thus, the estimates imply that although the minimum-wage rates are not binding, increases in them still have an indirect effect on firms' wages that is, moreover, rather large. This is clearly borne out by the regression analyses for both countries: the estimated influences on firms' labour demand are mixed, with the negative ones dominating. Assessing the impact on working hours is more straightforward, and is found to be negative for the Czech Republic. According to our estimations, the effect of the first large minimum-wage hikes in 1998–99 on total working hours is negative in the Czech Republic; for the Slovak Republic the working hours' coefficients are positive in the second period.

We next look at whether the impact of minimum-wage hikes differs between different types of firms.[12] More specifically, our intention is to examine whether the effects differ between firms that are operating with a profit motive and those that are not (state-owned firms, cooperatives). Furthermore, we will investigate whether there are differences between firms of different size in relation to wage and employment effects. This is of some interest as small firms are likely to be operating in a more competitive environment, leading us to expect a stronger negative effect on employment here. On the other hand, larger firms are more likely to fit the monopsony model of the labour market.

We begin by looking at the results for the Czech Republic. A first observation is that the size of the firm average wage effect does not differ between profit versus non-profit and small versus large firms in the first period but it does in the second where the effects are systematically larger in profit-motive and small firms. When looking at the employment effect, it should be noted that labour demand developed quite similarly in profit and non-profit firms between 1998 and 2000. For the first period the estimates for changes in employment differ considerably depending on which low-pay measure is used. For the second period the employment effect is consistently negative for all sub-samples. For changes in total hours, the results are similar; here there are negative effects in both types of firms and no noteworthy differences in their magnitudes. Distinguishing between small and larger firms shows negative employment effects, especially in the second period, and negative hours' effects in both periods. The coefficients in the change-in-hours equations are larger for smaller firms, but the differences are not statistically significant.

For the Slovak Republic, the same pattern as for the aggregate is also found for profit and non-profit firms as well as for small and

large firms. For Slovak firms there are some indications that the negative employment impacts are greater in the profit-motive and smaller firms.

In the two last columns of Tables 6 and 7 we report the results from estimations with changes in the number or proportion of less-educated employees. The idea is to determine whether this category of employees, which makes up a large proportion of the low-paid workers, is particularly hurt by the increase in minimum wages. As can be seen from the tables, in Slovakia there is little evidence of the demand for less-educated workers being affected, and for the Czech Republic the results are mixed — some cases of positive employment effects and a few small negative hours' effects.

6. Conclusions

In this paper, we have made use of fairly large and detailed databases, collected in an identical way and containing information from two countries: the Czech and Slovak Republics. This allows us to examine how the internationally large increases in minimum wages — 40 and 30 per cent — in these two countries in the late 1990s have affected firms' wage costs and their labour demand. Clearly, provided the minimum wage were binding, increases of this magnitude would in most cases lead most economists to expect substantial decreases in employment. But as the increases in both countries took off from very low levels, the minimum wages were binding only to a limited extent.

As is well known, increased minimum wages can lead to an increase in employment if an employer has monopsony in a local labour market. This can also happen even if there are a fairly large number of potential employers in the market. According to Manning (2003) and the evidence presented therein, local labour markets are frequently 'thin' from the perspective of individual workers. Thus, companies may very well operate as monopsonies.

The fact that the minimum wages are not binding except for a small part of the labour market does not mean, however, that changes in them do not have important indirect effects. In the case of the two countries studied here, two mechanisms are worth noting. Firstly, as the minimum wage constitutes the lowest tariff wage rate in the tariff system that underlies wage setting in both countries, increases in the minimum wage potentially affect a non-negligible part of the wage distribution. Secondly, and this is the case for the

Czech Republic in particular, increasing minimum wages closer to or above the subsistence wage is likely to strengthen the incentives of low-paid workers to supply their labour to the market and may reinforce adjustment mechanisms in monopsonistic markets.

A key and very robust result of our econometric analysis is that the minimum-wage hikes had a large positive effect on firms' average wages. This effect was stronger in non-profit than in profit firms. In the Czech Republic the first minimum-wage hikes in 1998–99 resulted in higher employment whereas the next hikes were accompanied by reductions in firms' demand for workers. In both periods the number of work hours was reduced. In the Slovak Republic the first hikes gave rise to a decline in firms' employment but no further changes in employment or hours. Thus, for both countries, the influences on firms' labour demand appear to be rather mixed. Likewise, in both countries there are no statistically significant differences in the labour demand effects between profit and non-profit firms or between small and medium-sized and large firms. Finally, we find that, at least in the short run, the minimum-wage increases do not seem to have changed the composition of firms' workforces very much.

To sum up, the evidence from the Czech and Slovak Republics presented in this paper indicates that the minimum-wage increases clearly raise firms' average wages. The pattern of the estimated effects on employment and working hours reflects the fact that elevating the minimum wage closer to and above the subsistence wage motivates low-paid workers to supply more of their labour. The relatively large impact on firms' average wages indicates that as the minimum wage becomes more binding, those portions of the wage distribution other than the lowest tail are affected too. A consequence of further minimum-wage increases may therefore be that the adverse employment effects become larger. Hence, policies committing the government to raise the minimum wage to a certain fraction of the average wage, before the consequences of the more recent minimum-wage hikes are known, may have unintended detrimental effects.

Notes

[1] Monetary policy has been conducted towards the growth of the interest rates.

[2] See Marcincin and Beblavy (2000) and Lubyova *et al.* (1999) for an overview of economic development in Slovakia.

[3] The unionization rate was and has remained about 20 per cent. In general, employers have taken a strongly negative attitude to the existence of trade unions in their companies.

[4] The minimum wage is currently used as the basis for the general health insurance contributions for certain categories lacking income from work, such as students, unemployed individuals who not eligible for unemployment benefits, women on maternity leave, self-employed individuals, etc.

[5] The same changes were made in the Czech Republic 1 year earlier.

[6] The 1991 Act distinguishes between single-person households and households with several members.

[7] Britain had in fact a minimum rate of pay system, where the rates were set by industry-based wage councils. This system was abolished in 1993. Dickens *et al.* (1999) examined the wage and employment consequences of changes in the minimum rates. Their results show a significant compression of wage dispersion but no negative impact on employment.

[8] Thus, the result is consistent with both the competitive and the monopsony model.

[9] For Czechoslovakia, Buchtíková (1995) carried out a simulation in an effort to describe the effect of a minimum-wage increase on employment and wage distribution in some Czechoslovak industries in the early 1990s. However, the simulations were not based on estimates of parameters using Czech data and, moreover, the data used in the simulations referred to state enterprises.

[10] We have also estimated the wage and employment equations on a pooled data set including both countries and both periods, obtaining, for the most part, the same results. The restrictions that the coefficients are equal across the two countries are, however, decisively rejected by the data.

[11] Overviews of the development in hourly wage distribution during 1998–2000 for the Czech and Slovak Republics are available from the authors on request.

[12] Unfortunately, in some cases the results for the subgroups for the Slovak Republic have to be based on rather few observations.

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