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Growth Resurgence, Productivity Catching-up and Labour Demand in CEECs

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Growth Resurgence, Productivity Catching-up and Labour Demand in CEECs

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Abstract

The collapse of communist regimes in Central and Eastern Europe marked a historical event for the countries on both sides of the iron curtain. Using the recently released EU KLEMS database on detailed sectoral growth and employment measures, we analyse the productivity performance in the period after 1995 for five transition economies, i.e. the Czech Republic, Hungary, Poland, the Slovak Republic and Slovenia, and compare their performance with a group of European core economies and partly Austria as a neighbouring small open economy. Our analysis reveals a strong catching-up process with the Western European economies in terms of productivity and sectoral structures. The factors driving this convergence process, however, differ across countries and industries. Apart from an analysis at the aggregate or broad sectoral performance we devote special emphasis to the detailed industry level and in particular to the manufacturing industry, which has served as the main driver in growth and productivity. We demonstrate that the Central and Eastern European countries have successfully specialized in higher-tech industries while maintaining gaps, albeit diminishing, in services. As the strong productivity catching-up was accompanied by low employment growth in the period 1995-2004 – despite high unemployment levels – we also investigate the labour market structures and the changes in patterns of employment.

Keywords: *economic transition, restructuring, growth, multifactor productivity, labour demand*

JEL classification: *D24, P52*

Peter Havlik, Sebastian Leitner and Robert Stehrer

Growth resurgence, productivity catching-up and labour demand in CEECs

1 Introduction

The collapse of communist regimes in Central and Eastern Europe in 1989/1990 marked a historical event for the countries on both sides of the iron curtain. The years after the political changes have been characterized first by a severe and widely unexpected decline of economic activities in the whole region, followed by a phase of rapid recovery, economic restructuring as well as productivity and technological catching-up, all occurring simultaneously roughly since 1995. The economic opening resulted in a redirection of trade flows towards Western Europe and in the attraction of foreign direct investment which facilitated also outsourcing activities from Western Europe, in particular from the bordering countries Austria and Germany. This highly dynamic process of economic restructuring and trade integration raises new challenges and opportunities for the whole of Europe. However, the challenges of the economic restructuring process were mainly felt in the Central and Eastern European countries and partly in the neighbouring economies such as Austria and Germany.

In this paper we investigate the period 1995-2004 for five Central and East European (CEE) countries: the Czech Republic, Hungary, Poland, Slovakia and Slovenia, and compare their growth and productivity performance with a group of West European core economies (EU-10): Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Spain and the United Kingdom, in order to provide a wider comparison of restructuring and catching-up processes in the period before EU accession.[1] For this purpose we mainly use the recently available detailed EU KLEMS database.[2]

The structure of the paper is as follows: In Section 2 we present the main macroeconomic and sectoral trends over the entire transition period and give an account of the key growth components during 1995-2004. In Section 3 we take a detailed look at the structure of the economies in the five countries under consideration in comparison with the EU-10 country group and show the patterns of structural convergence in a descriptive manner. In Section 4 we investigate the manufacturing sector, as this sector has played a special role in restructuring processes of the Central and Eastern European economies. We analyse economic developments at the level of total manufacturing with respect to various

[1] This group of countries is dictated by the availability of information on groups of countries in the EU KLEMS database, there abbreviated as 'EU15EX'.

[2] The database can be accessed via www.euklems.org. A detailed description of the methodology and data issues can be found in Timmer et al. (2007), also available from the EU KLEMS website. A first set of comparative results is presented in the first EU KLEMS productivity report (see van Ark et al., 2007).

indicators of growth performance and their determinants (multifactor and labour productivity growth, value added and employment growth, and the role of IT capital). Next, we also analyse structural changes and specialization patterns within the manufacturing sector. Finally, Section 5 deals in detail with structural shifts on the labour market regarding both employment and hours worked, as well as with changes in the labour composition according to different skills. Section 6 summarizes and concludes.

2 Overview of economic performance

2.1 The path from a command to a market economy

The five CEE countries underwent a severe crisis after the start of the transformation from a command to a market economy in the early 1990s. In a number of contributions the causes and consequences of the 'transformational' recession were discussed mainly in an empirical but also theoretical way (Eichengreen, 2007, Chapter 10; for a recent overview on empirical studies see Foster and Stehrer, 2007). From 1995 onwards most of the countries started to recover, though with some smaller recessions; this period, however – which will be the main focus of this chapter – can only be properly addressed when taking the earlier crisis into account. Let us thus have a look at the longer-term developments in these economies with respect to GDP growth, employment performance and the changes in the rate of unemployment. Figure 2.1 presents the index of GDP (1995 = 1) for these five economies.

As one can see, in 1995, GDP levels were lower than in 1990 in all countries but Poland (here the reference year is 1989)[3]. GDP had dropped by some 15% to 20% since the political regime change in 1989-90. The extent of that decline had been largely unexpected by most economists and still is a matter of debate. Thereafter, four out of the five economies investigated succeeded in remaining on a more or less stable growth path and thus reached the initial GDP levels again at the end of the 1990s. There has been a extensive debate, which is still not fully settled, on the drawbacks and merits of different policies – 'gradualism' versus 'shock therapy' – concerning the depth and length of the transitional recession (see Foster and Stehrer, 2007, for an overview). Only the Czech Republic suffered a more severe secondary crisis at the end of the 1990s due to a financial collapse and thus phased out its period of recovery until 1999. Thus from 1995 onwards (for Czech Republic from 1999) these countries experienced a period of rapid (though not spectacularly high) GDP growth rates between 3% and 4.5% on an annual average.

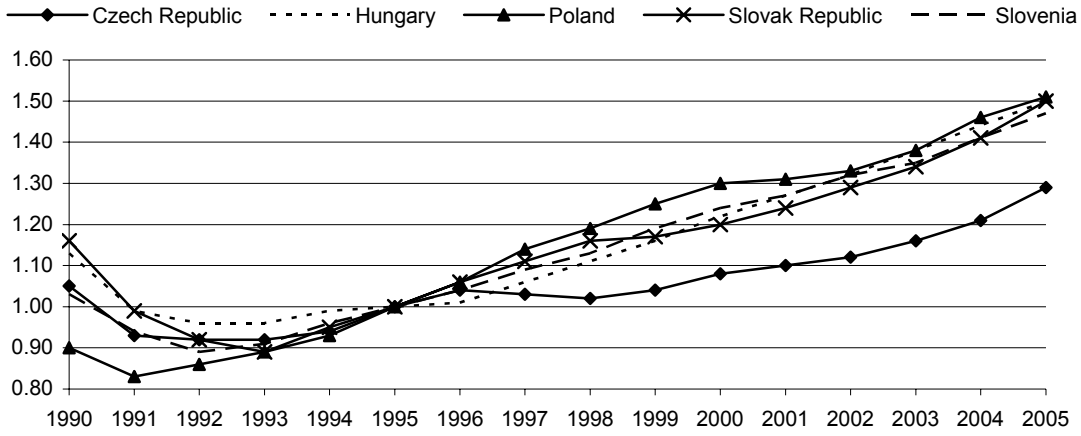
The 'transformational recession' together with strong improvements in productivity (discussed below in detail) had a severe impact on the levels of employment (see

[3] Poland slipped into a recession already in 1989 and thus started off transition with an already lower GDP level compared to 1995.

Figure 2.2[4]). In most countries (in particular in the Czech Republic, Hungary and Poland) employment levels are still lower than at the beginning of the transformation. Compared to the levels in 1995, employment was rising between 4% in the Slovak Republic and about 8% in Hungary and Slovenia – which has to be viewed against the background of an increase in GDP by almost 50% in these countries as can be seen from Figure 2.1 above. In Poland and the Czech Republic employment levels in 2005 are still below the levels in 1995 by about 5%. This sluggish employment growth is mainly explained by strong overall increases in (labour) productivity and the structural change. These aspects will be dealt with in more detail below.

Figure 2.1

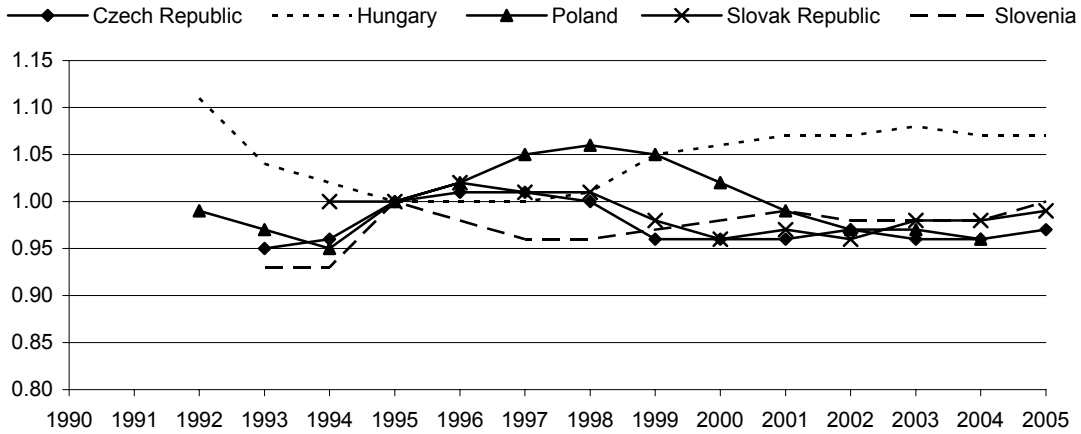
GDP index (1995 = 1)



Source: wiiw Handbook of Statistics 2006; own calculations.

Figure 2.2

Employment index (1995 = 1)



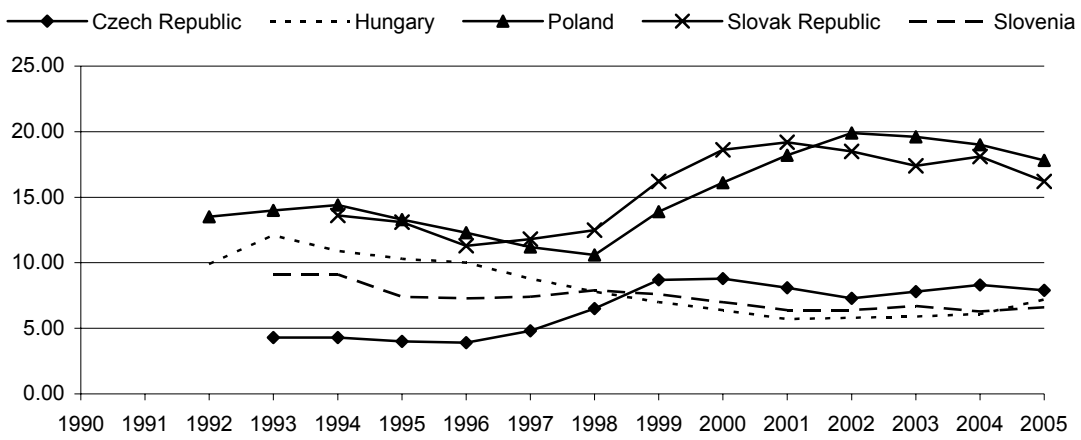
Source: wiiw Handbook of Statistics 2006 and EU KLEMS database November 2007; own calculations.

[4] Figures before 1995 are based on LFS data; from 1995 on the EU KLEMS database was used.

This resulted in high and persistent unemployment rates as shown in Figure 2.3 – despite already relatively low and in some cases even declining activity rates (see Landesmann, Vidovic and Ward, 2004, for details).

Figure 2.3

Unemployment rates (in %, LFS)



Source: wiiw Handbook of Statistics 2006.

Unemployment rates fluctuated between 5% and 10% in the Czech Republic, Hungary and Slovenia and have recently even started to come down thanks to strong GDP growth rates. The pattern, however, differs in the individual countries: whereas in Hungary and Slovenia unemployment rates were quite high already before 1995 and declined steadily thereafter, the Czech Republic experienced a large jump in its unemployment rate from less than 5% in 1996 to nearly 10% in 1999, due to delayed restructuring and the subsequent financial crisis. In the other two countries, Poland and the Slovak Republic, the unemployment rate started at already higher levels in the early 1990s and then jumped again to almost 20% at the end of the 1990s from which it has started to decline only more recently. In 2005, however, unemployment rates were still at high levels of between 16% in the Slovak Republic and almost 18% in Poland (Landesmann, Vidovic and Ward, 2004).

Summarizing, in all five economies under consideration the period before 1995 was characterized by a severe decline in economic activities. During this transformational recession GDP levels dropped by about 10% to 20% as compared to the level of 1989 – an unprecedented decline during peace times. The period of decline was then followed by a phase of recovery, starting with Poland already in 1992 and followed by other countries with a time lag of about two years. Some countries were hit by a secondary crisis at the end of the 1990s (see Foster and Stehrer, 2007, for an econometric analysis). In the present paper we investigate only the period after 1995, consistent with the coverage of Central and East European countries in the EU KLEMS database.

Thus, in the remaining part of this chapter we focus on the period from 1995 onwards, analysing GDP growth and productivity, components of growth at the aggregate and broad sectoral levels, as well as changes in employment patterns consistent with the coverage of the Central and Eastern European countries in the EU KLEMS database. The aim is to obtain a more detailed insight into the performance of these countries in this era of catching up and growth resurgence.

2.2 Comparative macroeconomic performance in a recovery phase of transition

Let us start with a comparison of the growth rates of some important macroeconomic variables. Table 2.1 presents the growth rates of output, intermediate inputs, and value added (all three variables are expressed at 1995 prices), employment, hours worked – which are also differentiated by educational attainment levels (high, medium and low) – and labour and multifactor productivity for the period 1995 to 2004 (2004 is the last year covered in the preliminary version of the EU KLEMS database). The table also includes figures for the EU-10 countries for the purpose of comparison.

Over the whole period 1995-2004, the Central and Eastern European countries performed relatively better in terms of output and value added growth than the West European core countries denoted by EU-10, with the exception of value added growth in the Czech Republic. For the other countries value added growth was between 3.5% and 4% over that period and thus approximately two percentage points higher than in the core Western economies (the EU-10 countries were growing at 2%). When considering the more recent period 2000-2004, also the Czech Republic performed relatively better compared to the EU-10. Output growth was even higher, particularly in Hungary and Poland, driven mainly by high growth rates of intermediate inputs.

The high value added growth rates were driven by high labour productivity growth, resulting in a fast catching-up process to Western economies as well as in strongly expanding internal and external demand. Altogether, demand growth was not sufficient to compensate for labour productivity growth, which implied that both employment and hours worked were declining (initially with the exception of Hungary where, however, hours worked started to decline in the period 2000-2004).

The high labour productivity growth combined with high (but not spectacular) growth of value added is reflected in the growth rates in the demand for labour, which was negative in nearly all these countries. The only exception was Hungary, where employment rose by 0.77% per year in that period. This was close to the average growth rate reached in the West European core countries. Thus, given the relatively high labour productivity growth rates, which reflect the catching-up process, overall growth was not sufficient to increase employment. Here one should note, however, that more recently most of these countries show higher productivity growth rates than in the period up to 2004, accompanied by

positive employment growth and even first signs of emerging labour shortages especially of skilled workers (see Gligorov and Richter, 2007). A closer look reveals that the earlier unfavourable employment dynamic was unevenly distributed across the different skill groups of workers (see Section 5 for details).

Table 2.1

Average annual growth rates in %, 1995-2004

	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
			Period 1995-2004			
Gross output	4.17	6.23	4.75	3.02	3.74	2.30
Intermediate inputs	5.49	7.61	5.43	2.57	3.46	3.24
Gross value added	1.67	4.15	3.81	3.58	3.84	2.02
Employment	-0.48	0.77	-0.41	-0.27	-0.21	1.18
Hours worked	-0.83	0.54	-0.52	-1.19	-0.46	0.78
High-skilled	1.43	3.27	3.88	1.07	3.58	4.27
Medium-skilled	-0.77	0.56	-0.77	-0.93	-0.03	0.78
Low-skilled	-4.98	-2.47	-2.73	-8.49	-4.66	-1.25
Labour productivity	2.50	3.61	4.33	4.78	4.30	1.24
Multifactor productivity	-0.47	2.40	2.60	n.a..	0.69	0.12
			Period 2000-2004			
Gross output	5.34	4.73	3.16	1.57	3.20	1.45
Intermediate inputs	6.76	5.32	3.47	-0.18	2.90	1.79
Gross value added	2.75	3.49	2.59	3.71	3.48	1.40
Employment	-0.05	0.23	-1.46	0.38	0.02	0.79
Hours worked	-1.31	-0.57	-1.83	-0.91	-0.24	0.44
High-skilled	1.56	4.14	6.78	3.85	4.35	3.71
Medium-skilled	-1.08	-0.66	-2.22	-1.25	0.32	0.41
Low-skilled	-8.65	-5.55	-6.73	-7.90	-5.91	-1.62
Labour productivity	4.06	4.06	4.42	4.62	3.72	0.96
Multifactor productivity	0.74	1.72	2.30	n.a.	1.31	-0.06

Source: EU KLEMS database, March 2007, www.euklems.net; and own calculations.

There is, however, a strong skill bias in the structure of labour demand as growth rates for the highly educated workers are positive in all Central and Eastern European countries and in some cases (particularly in the period 2000-2004) even higher than value added growth. On the other hand, growth rates for workers with low educational attainment are negative and quite large in all countries, ranging from -2% to even -8%. A similar pattern is observed for the Western core economies (EU-10). The main reasons for this consist in the skill bias in the pattern of technical change (when catching up to Western technologies) and the structural shifts towards more skill-intensive industries. These patterns of employment dynamics reflect an uneven process of catching-up in terms of productivity, skill-biased technical change within sectors as well as structural shifts in the composition of industries (see Stehrer, 2005, for an in-depth analysis of the changing patterns in labour demand

structures). A more detailed discussion on employment structures and dynamics is provided in Section 5.

As mentioned above, labour productivity growth was very strong in all countries under investigation. The high growth rates are mainly a reflection of the catching-up process: the starting level of GDP per capita and GDP per employed person was much lower in the five Central and Eastern European countries than in other EU countries. In Table 2.2 we report labour productivity levels (value added at 1995 prices per hour worked at PPP 1995) for Austria and the five countries.[5] As one can see, in 1995 labour productivity compared to Austria reached only 33% in Poland and was 48% in Slovenia, the most advanced country. These productivity gaps narrowed remarkably in the Slovak Republic and Slovenia where the level compared to Austria reached 52% and 62% respectively in 2004 (i.e. an increase by 13 percentage points). Poland, still lagging behind the other countries, did also quite well, improving by 9 percentage points (from 33% to 42%). Somewhat slower progress can be observed in Hungary (plus 8 percentage points) and the Czech Republic (plus 4 percentage points).[6]

Table 2.2

Labour productivity levels (at 1995 PPP)

	Value added per hour worked			in % of Austria		
	1995	**2000**	**2004**	**1995**	**2000**	**2004**
Austria	23.4	26.0	27.0	100.0	100.0	100.0
Czech Republic	10.3	11.0	12.9	44.0	42.3	47.9
Hungary	9.5	11.2	13.2	40.6	43.1	48.8
Poland	7.7	9.5	11.3	32.7	36.5	41.8
Slovak Republic	9.1	11.6	14.0	38.9	44.9	51.9
Slovenia	11.3	14.3	16.6	48.2	55.2	61.5

Source: EU KLEMS database, March 2007, www.euklems.net; and own calculations.

Finally, coming back to Table 2.1, multifactor productivity growth – as compared to the West European core economies EU-10 – was higher in most of the Central and Eastern European economies over the period 1995-2004. The exception is again the Czech Republic where this is true only for the second subperiod. There is, however, a quite large variety in magnitudes, with Hungary and Poland showing the highest growth rates of multifactor productivity.[7] This issue is addressed in more detail in the next section, which looks at the sectoral structure of growth and individual contributions to growth.

[5] We use Austria as the reference country because PPP rates are not available for country aggregates such as the EU-10. The PPP rate is taken from Eurostat with the EU-15 countries as a reference.

[6] In fact, the catching-up process has markedly accelerated after the CEE countries' accession to the EU in 2004 (see Gligorov, Richter et al., 2007, for a recent study).

[7] For the Slovak Republic no multifactor productivity indicators are available due to the lack of capital stock data.

2.3 Sectoral growth performance and contributions to growth

Table 2.3 presents growth rates for value added, number of employed persons, total hours worked, labour productivity (gross value added per hour worked) for the total economy and seven industry aggregates. We shall not go into the details for each country (for those see van Ark et al., 2007, i.e. the first EU KLEMS productivity report) but rather present a cross-country comparison of the relevant variables. The overall performance of these countries compared to the Western European core economies has been outlined in the previous section.

The first line in Table 2.3 again presents growth rates for the whole economy; some of these have already been discussed above (see Table 2.1). Starting with the overall growth of gross value added, the first striking issue is that growth in 'Electrical machinery, post and communication' was highest in the Central and Eastern European economies, ranging between 7.4% in Slovenia and 15.1% in Hungary. This is in most cases (i.e. excepting the Slovak Republic) followed by growth in 'Distribution services' and 'Finance and business services'. Growth in the latter industry was especially high in Poland (8%) and Slovenia (6.1%). Other manufacturing industries reaching high growth rates are 'Manufacturing, excluding electrical' – particularly in Poland and the Slovak Republic. Generally, these patterns of growth rates imply a shift towards more high-tech and skill-intensive industries in both the manufacturing and services sectors.

Looking at the column presenting productivity growth rates (GVA per hour worked) one observes that high value added growth rates coincide with high productivity growth rates and particularly so in the manufacturing industries. Furthermore, the labour productivity growth rates in the manufacturing industries are higher than in the other sectors in general. This linkage between value added and labour productivity growth is less pronounced in the services sectors 'Distribution services' and 'Finance and business services' where productivity growth is even negative in Hungary and Poland in the latter industry.

This implies that employment growth (measured either in persons engaged or hours worked) is quite low in the fast growing manufacturing sectors. For 'Manufacturing, excluding electrical' productivity growth outstripped value added growth in all countries implying decreasing labour demand. Employment in the higher-tech manufacturing industry 'Electrical machinery, post and telecommunication' was declining only in Poland; that industry is, however, characterized by very low employment growth in the other economies as well. In most countries, in terms of employment growth, the strongest performance is observed in the services sectors and here particularly in 'Finance and business services' where growth rates reached 5% to 6% in Hungary and Poland. However, growth rates are less pronounced in the other countries. In the Czech Republic in particular, employment growth in that industry has been quite low compared to other Central and Eastern European economies.

Table 2.3

Gross value added, labour input and labour productivity, 1995-2004

	(annual average volume growth rates, in %)				Average share in total hours worked (%)	Contribution to LP growth in total industries
	Gross value added	Total persons engaged	Total hours worked	GVA per hour worked		
Czech Republic						
TOTAL INDUSTRIES	1.7	-0.5	-0.8	2.5	100.0	2.5
.Electrical machinery, post and communication	9.7	2.0	1.5	8.2	4.6	0.3
.Manufacturing, excluding electrical	2.6	-0.9	-1.2	3.8	23.9	0.9
.Other goods producing industries	-1.9	-3.6	-3.8	1.9	18.4	0.4
.Distribution services	4.4	-0.3	-0.5	4.8	21.1	1.0
.Finance and business services	3.1	1.9	1.4	1.7	9.1	0.1
.Personal and social services	-1.9	1.5	1.2	-3.1	6.9	-0.2
.Non-market services	-1.0	0.3	-0.1	-0.9	16.1	-0.1
.Reallocation of labour effect						0.0
Hungary						
TOTAL INDUSTRIES	4.1	0.8	0.5	3.6	100.0	3.6
.Electrical machinery, post and communication	15.1	3.5	3.1	12.0	5.6	0.6
.Manufacturing, excluding electrical	2.4	-0.5	-0.8	3.2	20.4	0.7
.Other goods producing industries	2.6	-1.1	-0.9	3.5	17.1	0.6
.Distribution services	3.9	1.1	0.7	3.2	20.8	0.7
.Finance and business services	5.2	6.0	5.4	-0.2	6.9	0.0
.Personal and social services	0.7	0.6	0.1	0.6	8.1	0.1
.Non-market services	3.7	0.8	0.8	3.0	21.1	0.6
.Reallocation of labour effect						0.4
Poland						
TOTAL INDUSTRIES	3.8	-0.4	-0.5	4.3	100.0	4.3
.Electrical machinery, post and communication	9.7	-1.5	-1.7	11.4	2.3	0.3
.Manufacturing, excluding electrical	5.9	-2.5	-2.5	8.4	16.4	1.5
.Other goods producing industries	0.6	-0.7	-0.7	1.3	40.1	0.5
.Distribution services	4.4	0.1	-0.5	4.9	17.7	0.9
.Finance and business services	8.0	5.0	4.9	3.1	5.5	0.1
.Personal and social services	2.1	1.5	0.7	1.4	3.6	0.0
.Non-market services	1.7	-0.2	0.1	1.5	14.5	0.2
.Reallocation of labour effect						0.7
Slovak Republic						
TOTAL INDUSTRIES	3.6	-0.3	-1.2	4.8	100.0	4.8
.Electrical machinery, post and communication	9.0	1.3	0.9	8.1	4.4	0.3
.Manufacturing, excluding electrical	4.8	-1.8	-2.0	6.8	22.1	1.5
.Other goods producing industries	3.7	-3.5	-4.5	8.2	16.5	1.6
.Distribution services	2.5	2.5	1.2	1.3	20.9	0.2
.Finance and business services	2.1	4.3	3.2	-1.1	7.7	-0.1
.Personal and social services	2.8	-1.0	-1.7	4.5	6.7	0.3
.Non-market services	3.0	-0.3	-1.9	4.9	21.7	1.1
.Reallocation of labour effect						-0.3
Slovenia						
TOTAL INDUSTRIES	3.8	-0.2	-0.5	4.3	100.0	4.3
.Electrical machinery, post and communication	7.4	0.7	0.8	6.6	4.2	0.3
.Manufacturing, excluding electrical	4.4	-1.9	-1.6	6.1	24.7	1.6
.Other goods producing industries	2.2	-1.9	-2.8	5.0	24.6	1.3
.Distribution services	2.3	-0.4	-0.5	2.8	17.1	0.5
.Finance and business services	6.1	2.7	2.5	3.6	8.8	0.3
.Personal and social services	4.5	1.4	0.9	3.6	6.1	0.2
.Non-market services	3.1	2.4	2.7	0.4	14.4	0.1
.Reallocation of labour effect						0.1

Table 2.4a

Gross value added growth and contributions, 1995-2004

(annual average volume growth rates, in %)

	Gross value added growth	Contribution of Labour input growth	*of which Total hours worked*	*of which Labour composition*	Contribution of Capital input growth	*of which ICT capital*	*of which Non-ICT capital*	Contribution of Multifactor productivity growth
	(1)=(2)+(5)+(8)	(2)=(3)+(4)	(3)	(4)	(5)=(6)+(7)	(6)	(7)	(8)
Czech Republic								
MARKET ECONOMY	2.3	-0.3	-0.5	0.2	2.5	0.8	1.7	0.1
.Electrical machinery, post and communication	9.7	0.9	0.7	0.1	7.4	3.7	3.7	1.4
.Manufacturing, excluding electrical	2.6	-0.5	-0.6	0.1	2.3	0.3	1.9	0.7
.Other goods producing industries	-1.9	-2.0	-2.2	0.2	1.8	0.2	1.5	-1.7
.Distribution services	4.4	0.0	-0.2	0.2	2.5	0.7	1.8	1.9
.Finance and business services	3.1	1.2	0.9	0.3	2.1	1.4	0.7	-0.1
.Personal and social services	-1.9	0.9	0.7	0.2	0.9	0.4	0.5	-3.6
Hungary								
MARKET ECONOMY	4.3	1.0	0.6	0.4	1.0	0.6	0.4	2.2
.Electrical machinery, post and communication	15.1	1.8	1.4	0.4	2.4	1.0	1.5	10.9
.Manufacturing, excluding electrical	2.4	-0.1	-0.4	0.3	1.4	0.4	1.1	1.1
.Other goods producing industries	2.6	-0.5	-0.8	0.3	-0.3	0.2	-0.5	3.3
.Distribution services	3.9	1.2	0.8	0.4	0.7	0.5	0.2	1.9
.Finance and business services	5.2	4.1	3.4	0.7	1.6	1.5	0.1	-0.5
.Personal and social services	0.7	0.6	0.0	0.6	0.9	0.7	0.2	-0.7
Poland								
MARKET ECONOMY	4.4	-0.3	-0.5	0.2	2.2	n.a.	n.a.	2.5
.Electrical machinery, post and communication	9.7	-0.7	-1.0	0.2	2.6	n.a.	n.a.	7.9
.Manufacturing, excluding electrical	5.9	-1.4	-1.6	0.2	0.6	n.a.	n.a.	6.8
.Other goods producing industries	0.6	-1.4	-1.7	0.3	0.7	n.a.	n.a.	1.4
.Distribution services	4.4	-0.1	-0.3	0.2	3.8	n.a.	n.a.	0.7
.Finance and business services	8.0	2.4	2.1	0.2	4.7	n.a.	n.a.	0.9
.Personal and social services	2.1	1.3	1.0	0.3	0.9	n.a.	n.a.	-0.1

Table 2.4b

Gross value added growth and contributions, 1995-2004

(annual average volume growth rates, in %)

	Gross value added growth	Contribution of Labour input growth	*of which Total hours worked*	*of which Labour composition*	Contribution of Capital input growth	*of which ICT capital*	*of which Non-ICT capital*	Contribution of Multifactor productivity growth
	(1)=(2)+(5)+(8)	(2)=(3)+(4)	(3)	(4)	(5)=(6)+(7)	(6)	(7)	(8)
Slovak Republic								
MARKET ECONOMY	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
.Electrical machinery, post and communication	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
.Manufacturing, excluding electrical	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
.Other goods producing industries	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
.Distribution services	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
.Finance and business services	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
.Personal and social services	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Slovenia								
MARKET ECONOMY	4.1	0.0	-0.2	0.2	1.6	0.5	1.1	2.5
.Electrical machinery, post and communication	7.4	0.8	0.6	0.2	3.2	2.6	0.7	3.4
.Manufacturing, excluding electrical	4.4	-0.8	-1.0	0.2	1.6	0.3	1.2	3.7
.Other goods producing industries	2.2	-0.7	-1.1	0.4	0.4	0.3	0.1	2.6
.Distribution services	2.3	-0.2	-0.3	0.1	1.5	0.1	1.4	1.1
.Finance and business services	6.1	1.9	1.8	0.1	2.7	1.1	1.7	1.4
.Personal and social services	4.5	1.1	0.9	0.2	1.0	0.4	0.6	2.4

We have seen above that it was mainly 'Electrical machinery, post and telecommunication' and 'Finance and business services' (and in some cases also 'Distribution services') that have experienced fairly high growth rates in almost all of the five economies. However, the share of employment in the first two industries is quite low (between 2.3% in Poland and 5.6% in Hungary for 'Electrical machinery, post and telecommunication' and between 5.5% in Poland and 9.1% in the Czech Republic for 'Finance and business services'). It is much larger in the other fast growing industry, 'Distribution services', with about 17% in Slovenia and Poland and more than 20% in the other countries. Since the contribution to labour productivity growth in total industries (last column in Table 2.3) is the product of the labour productivity growth rate and the employment share, the ranking of the contributions to labour productivity growth is somewhat different from the ranking with respect to gross value added or labour productivity growth itself. Here it turns out that in most countries – the Czech Republic, Poland, the Slovak Republic and Slovenia – the industries 'Manufacturing, excluding electrical' and 'Other goods producing industries' show the highest contributions to overall labour productivity growth. 'Other goods producing industries' are, however, not important in Poland despite their large share of employment as the productivity growth rate is rather low. In Hungary the three goods producing sectors are almost equally important together with 'Distribution services' and 'Non-market services'. The industry performing best with respect to value added and labour productivity growth, 'Electrical machinery, post and communication', is less important in terms of contributions due to its low employment share. In the services industries it is mainly the 'Distribution services' industry which is important while 'Finance and business services' play only a minor role. This is especially the case in the Czech Republic, Hungary and Poland but to a lesser extent also in the Slovak Republic and in Slovenia. In the latter country these two industries are almost equally important.

The importance of 'Distribution services' is mainly explained by high employment shares and higher productivity growth rates in general (in all countries except Slovenia). The effect of reallocation of labour contributed relatively less in most countries. Only in Poland does an effect of 0.7 percentage points indicate a remarkable shift of labour towards industries with higher productivity levels. Second ranks Hungary with a value of 0.4.

As we have seen, the growth rates of value added differ across industries for each country although there is a more or less coherent pattern of the relative importance of the particular industries. We now turn to factors that might explain the growth rates of value added. Table 2.4 reports the growth rates of value added for industries in the market economy (i.e. all industries except 'Non-market services'). In the growth accounting framework, the growth rate of value added is the sum of changes in factor inputs, i.e. labour measured in total hours worked, labour composition, capital which is differentiated by ICT and non-ICT capital and the remaining part referred to as multifactor productivity growth.[8]

[8] This exercise could not be performed for the Slovak Republic due to the lack of data.

As we have already discussed above (see Table 2.1) employment growth was negative in all countries except Hungary. From this one might expect a negative contribution of labour inputs to value added growth in the market economy as well. This turns out to be the case for the Czech Republic and Poland (Table 2.4). In Slovenia, the contribution of employment growth was zero. Only in Hungary can we find a positive contribution of one percentage point. However, there are remarkable differences across industries. The contribution of labour input is in most cases positive in the high-tech industry 'Electrical machinery, post and communication' and the services industry 'Finance and business services'. As shown above, in these industries value added growth was outstripping labour productivity growth. Only Poland shows a negative contribution in 'Electrical machinery, post and communication', which is however relatively low as compared to other industries. The contribution of labour input growth can be split into a pure quantity measure, i.e. total hours worked, and a 'quality' measure referred to as change in the labour composition (i.e. a shift of employment towards jobs with higher marginal productivity).[9] For the market economy the quantity of total hours worked was negative (again except Hungary) whereas change in labour composition contributed positively in all countries. In Hungary, the quantity change was however larger than the composition effect. Again, there are remarkable differences at the industry level. The labour composition effect turns out to be positive for all countries and industries. The size of this effect is remarkably similar across industries in most countries. Larger differences can be observed only in 'Distribution services' in Hungary and 'Other goods producing industries' in Slovenia (see Section 5 for more details).

The second input factor we consider is capital. As opposed to labour input, the contribution of capital to growth is strongly positive in all countries in the market economy (Table 2.4). In the Czech Republic the contribution of this factor is as high as the value added growth rate itself; it accounts for almost half of value added growth in Poland and for one third in Slovenia. Only in Hungary is this factor not that important. With respect to particular industries, one tends to find higher values especially in the faster growing industries. However, when relating the contribution of capital input growth to the overall value added growth by industry, the pattern is slightly different. In the Czech Republic the contribution of capital input growth relative to value added growth by industry fluctuated between 55% and almost 90%, thus giving a strong role to changes in the input structure towards more capital-intensive production. In Hungary, the role of capital was particularly strong in 'Manufacturing, excluding electrical' with almost 60% (again relative to value added growth). But it played a minor role in the other industries with the exception of 'Personal and social services' where it was even larger than value added growth. Again, the pattern is different in Poland where capital growth contributed mainly in 'Other goods producing industries' and 'Distribution services' and to a lesser extent in 'Finance and business services'. Finally, in Slovenia the contribution of capital input growth was strong especially in 'Distribution services' with about 70%. It was however quite low in 'Other goods

[9] This issue will be discussed in more detail in Section 5.

producing industries' with only less than 20%; the other sectors are being in between. This points towards remarkable differences in the explanation of industry performance across countries and may be either due to differences in composition changes within these industry aggregates or to differences in adapted technologies.

The contribution of capital is split into contribution of ICT capital and non-ICT capital (columns [6] and [7] in Table 2.4).[10] In the Czech Republic and Slovenia, the contribution of non-ICT capital was more important. However, this is mainly due to the larger share in the capital stock as the growth rates of ICT capital are generally larger. In Hungary the contributions of these two factors are almost equally important. Again, there are remarkable differences across industries. In the Czech Republic the contribution of ICT capital is equally important in 'Electrical machinery, post and communication' and even much higher in 'Finance and business services'. In Hungary – where ICT capital contributed more than non-ICT capital in the market economy but capital in general contributed relatively little to value added growth – the contribution of ICT capital was particularly high in the services industries. It was also higher in 'Other goods producing industries' where the contribution of non-ICT capital was even negative. However, ICT capital also played an important role in 'Electrical machinery, post and communication'. In Slovenia, the contribution of ICT capital was relatively important again in 'Electrical machinery, post and communication' (with 2.6 versus 0.7 percentage points), 'Finance and business services' and 'Personal and social services'.

Finally, this leads us to the remaining part of value added growth which cannot be attributed to labour and capital input growth, i.e. multifactor productivity growth. Let us again first compare this item for the market economy across countries. In the Czech Republic, multifactor productivity was only marginally important since – as we have seen – capital input growth was fairly strong (Table 2.4). In the other three countries about 50% to 60% cannot be explained by growth of input factors, which gives an important role to unmeasured factors. With respect to industry differences, the striking fact is that multifactor productivity is often negative in services sectors (the exception being Slovenia) meaning that growth of labour and capital input was larger than value added growth, which may have been important in terms of capacity building in this period. In the other cases multifactor productivity growth is less important when compared to the other sectors. Secondly, multifactor productivity growth played a larger role in the 'Other goods producing industries' compared to other industries in Hungary, Poland and Slovenia (in the Czech Republic value added growth in that industry was negative). With respect to the other industries the pattern is quite mixed. In the Czech Republic – where multifactor productivity played a minor role in general – one can find a sizeable contribution in 'Electrical machinery, post and communications' as well as in 'Distribution services'. In Hungary, the contribution of multifactor productivity is extremely important in 'Electrical machinery, post and communication' which is also the case for Poland

[10] This could not be calculated for Poland as capital stock data on ICT and non-ICT capital were not available.

together with an important contribution in 'Manufacturing, excluding electrical'. Finally, in Slovenia multifactor productivity growth is important in both 'Electrical machinery, post and telecommunications' and 'Manufacturing, excluding electrical', and similarly important in the other sectors, contributing about 50% of value added growth.

3 The restructuring process in CEE economies

3.1 Broad structural shifts and convergence

All CEE countries have experienced fast structural changes, in particular during the first period of transition when most economic activities recorded huge declines ('passive restructuring'). The broad sectoral shifts were then summarized – in classical terms – as de-agrarianization, de-industrialization and tertiarization (for details see European Competitiveness Report 2003, Chapter 4). In the period of economic recovery starting from the mid-1990s, the speed of restructuring slowed down and restructuring patterns changed – though not uniformly in all countries concerned. The changes in nominal value added shares are presented in Figure 3.1 (see also Appendix Tables A.3.1). The processes of de-agrarianization have continued in all CEE countries as the share of value added in Agriculture, hunting and forestry (AtB) declined further although from already low values. Real estate, renting and business activities (JtK) and Community, social and personal services (LtQ) increased in all countries. In the other services sectors there is no clear pattern across these countries. Larger changes can be observed for the value added shares of Wholesale and retail trade (G) in the Czech Republic and the Slovak Republic, but remained constant or even slightly decreased in the other countries. Transport (I) increased mainly in Poland and Slovenia. The value added shares of manufacturing (D) – which is still the largest sector in most countries (exceptions are Hungary and Slovenia) – increased in the Czech Republic and only negligibly so in Hungary in the period 1995-2004; in the other countries the nominal shares have slightly fallen.

From the viewpoint of whether a process of structural convergence to the European countries can be observed, it is even more interesting to look at the differences to the latter group of countries. Figure 3.2 therefore presents the deviations of value added shares in the CEE countries vis-à-vis the EU-10 country group in percentage points for 1995 and 2004. In most countries the sectors Agriculture (AtB), Manufacturing (D), and most service sectors – apart from Financial intermediation (J), Real estate, renting and business activities (K) and Community, social and personal services – show higher shares compared to the EU-10. By contrast, the latter three sectors are highly underrepresented in all CEE countries. The

Figure 3.1

Shifts in the structure of (nominal) value added between 1995 and 2004

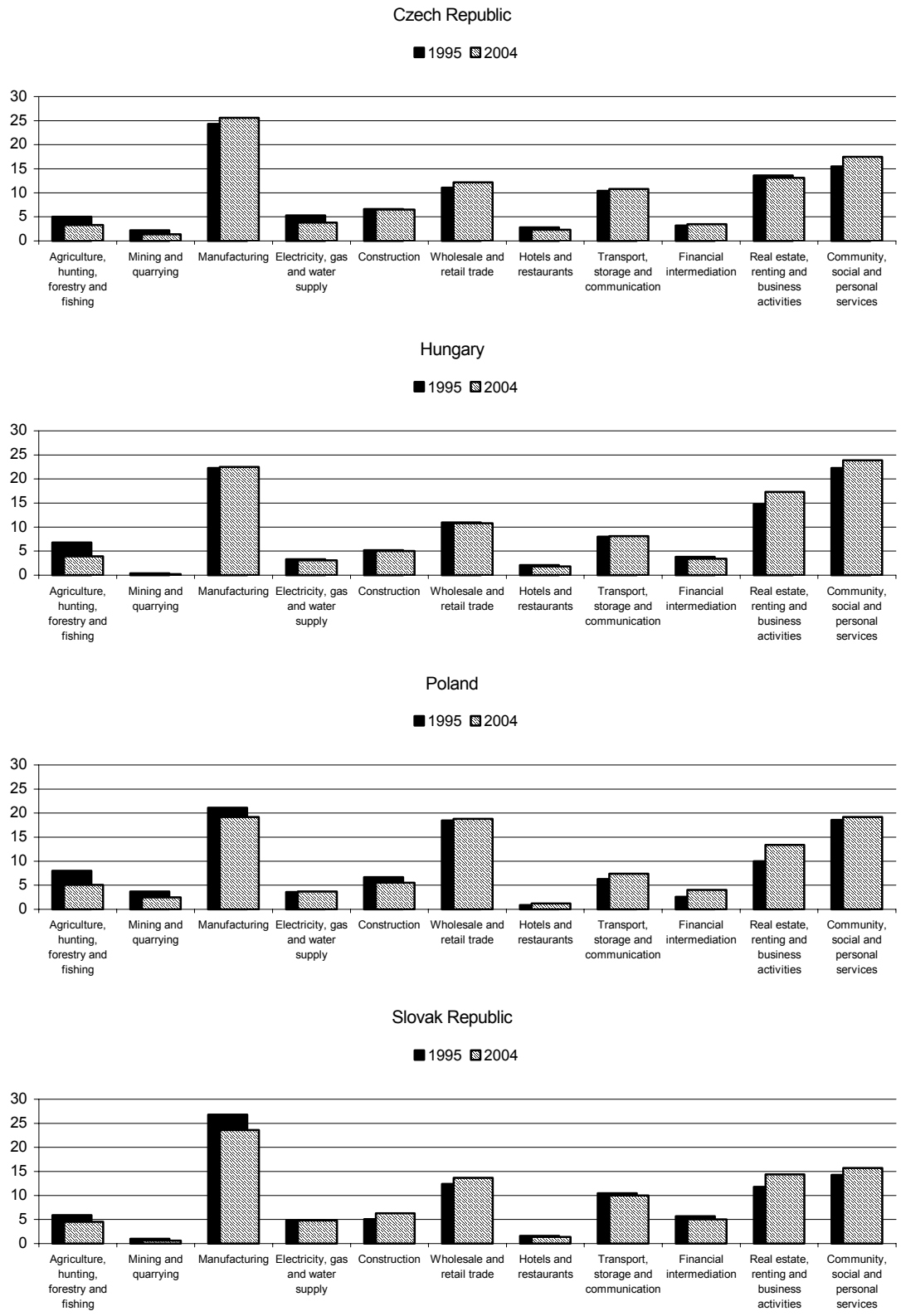
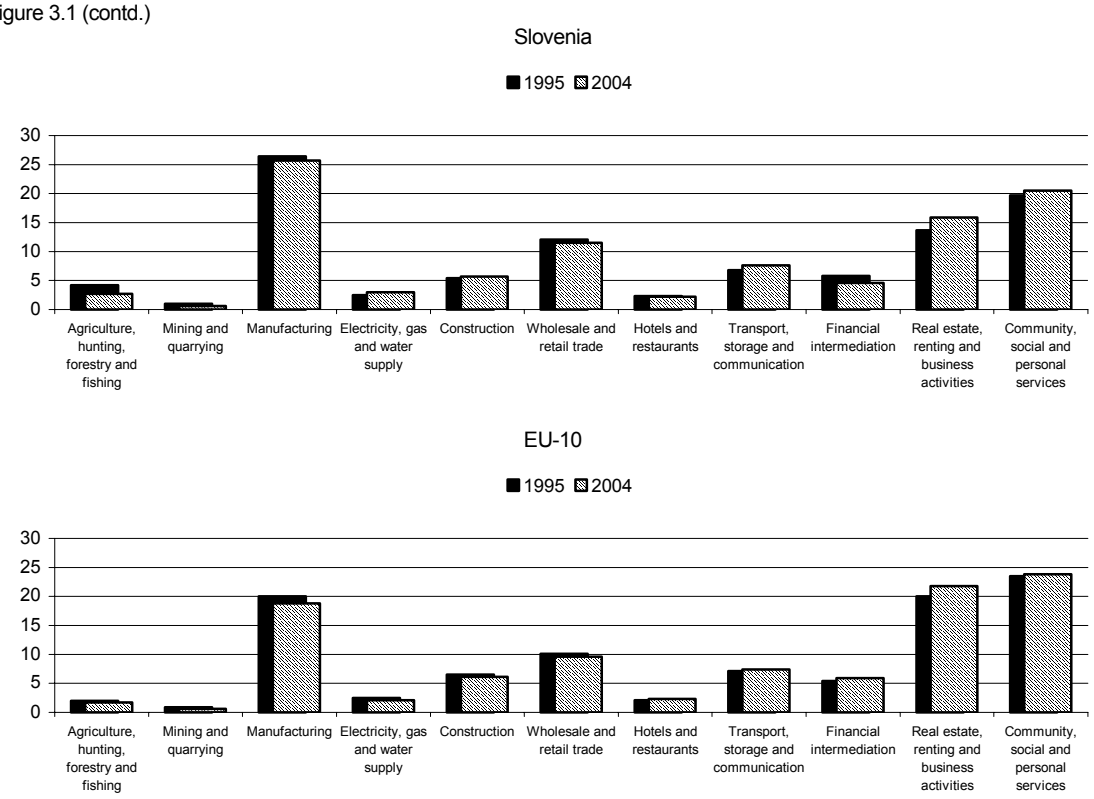


Figure 3.1 contd.

Figure 3.1 (contd.)



Source: Own calculations based on EU KLEMS database.

Figure 3.2

Deviations in (nominal) value added shares to EU-10, 1995 and 2004

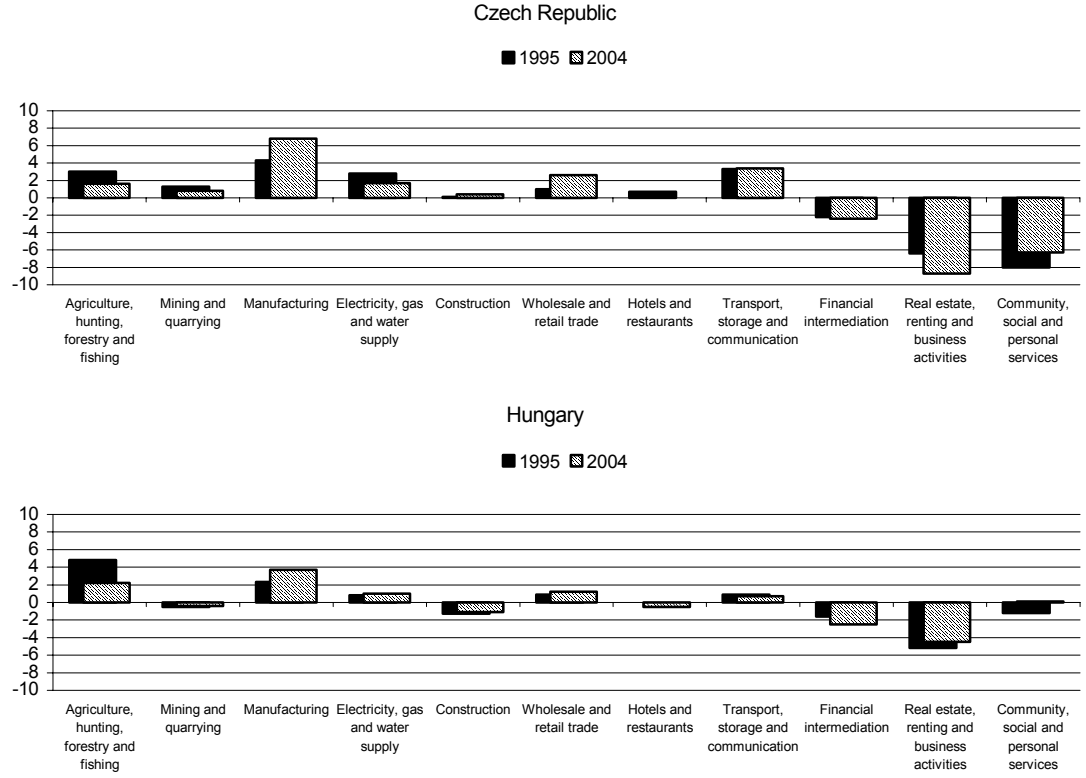
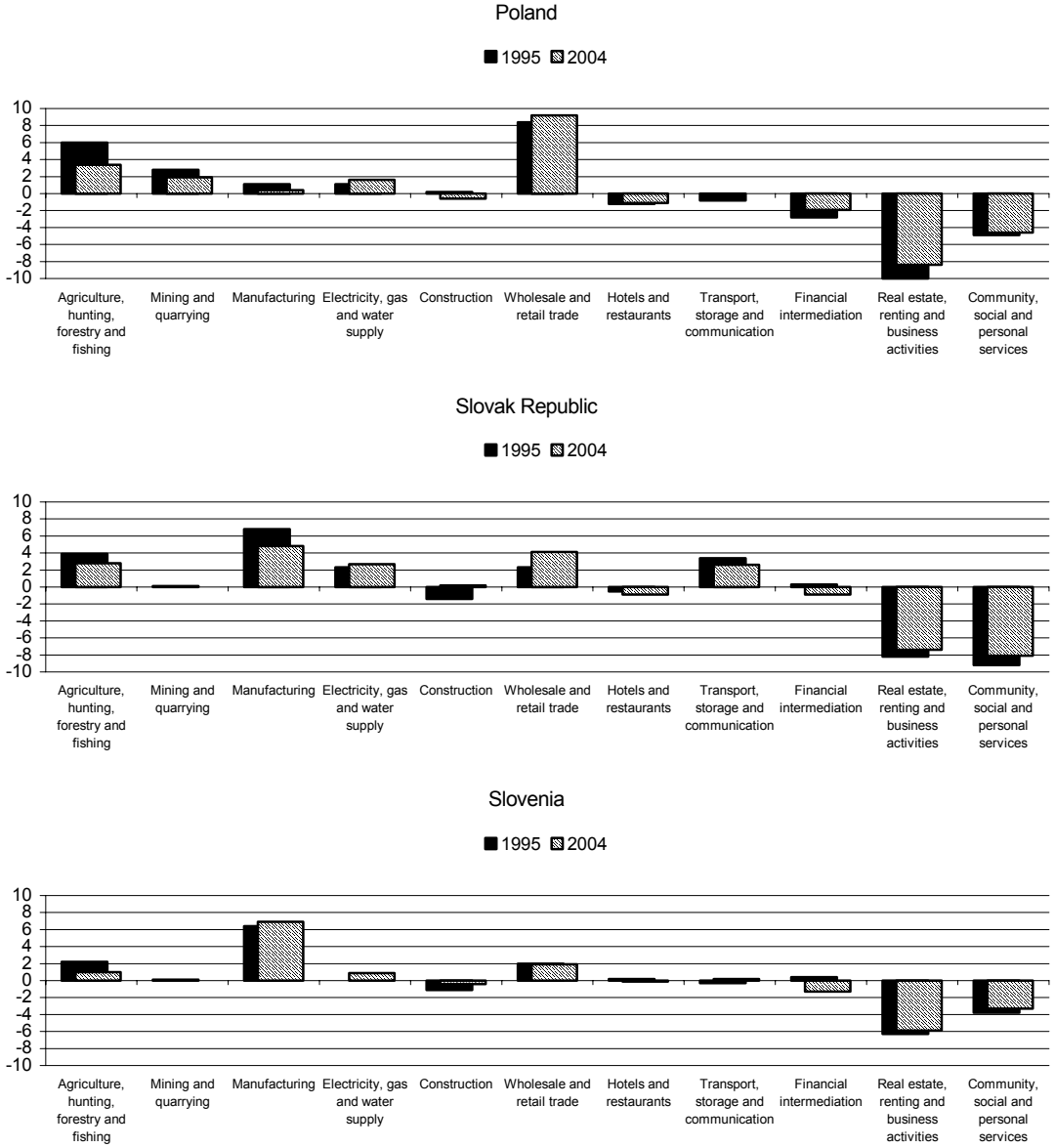


Figure 3.2 contd.

Figure 3.2 (contd.)



Source: Own calculations based on EU KLEMS database.

difference is up to 8 percentage points in Poland and the Czech Republic. In general, Community and social services were contributing relatively less to GDP in the Czech and Slovak Republics.[11]

By the year 2004, the structure of GDP, however, became more similar across the CEE countries with respect to the larger sectors. As shown in Figure 3.2, the share of Agriculture, hunting, forestry and fishing (AtB) diminished in all countries, whereas Real

[11] The nominal value added shares are affected by differences in relative price levels; the latter are particularly low in CEECs' community, social and personal services (see OECD, 2004). Employment shares show a slightly different picture – see Section 5.

estate, renting and business services (K) and Community, social and personal services (LtQ) increased also relative to the EU-10 (one exception is the Czech Republic in sector K). These two sectors now account for about 20% shares of value added in GDP (slightly less in the Czech and the Slovak Republics), but are still lower than in the EU-10 (except Community, social and personal services in Hungary).

Let us also have a look at the share of hours worked in these broader sectors. As we are particularly interested in the deviations from the EU-10, we only present the differences in the shares in percentage points in Figure 3.3.

Generally, the same broad pattern is observed for the structure of hours worked as well.[12] One remarkable development is that the shares of hours worked in Manufacturing (D) are increasing in all CEE countries relative to the EU-10, as presented in Figure 3.3; in absolute terms, the shares are decreasing as can be seen in Appendix Table A.3.1c. The developments with respect to employment and hours worked are discussed in Section 5 below and thus we shall not go into details here.

Figure 3.3

Deviations in shares of hours worked to EU-10, 1995 and 2004

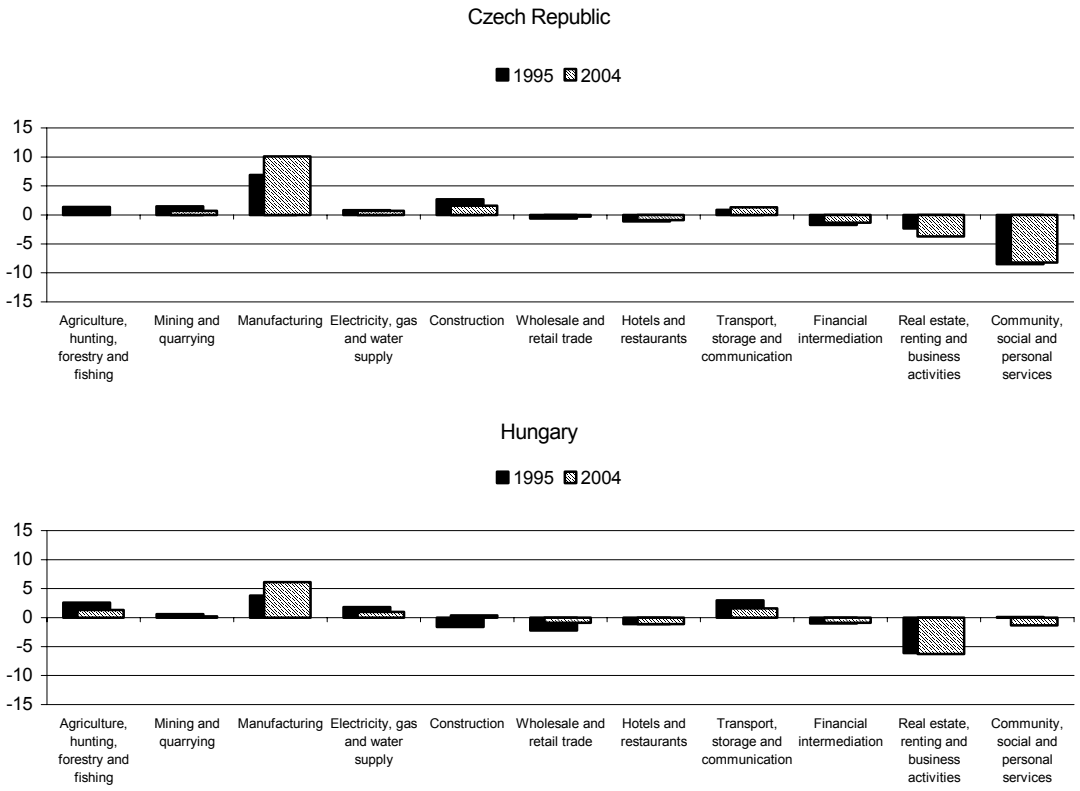
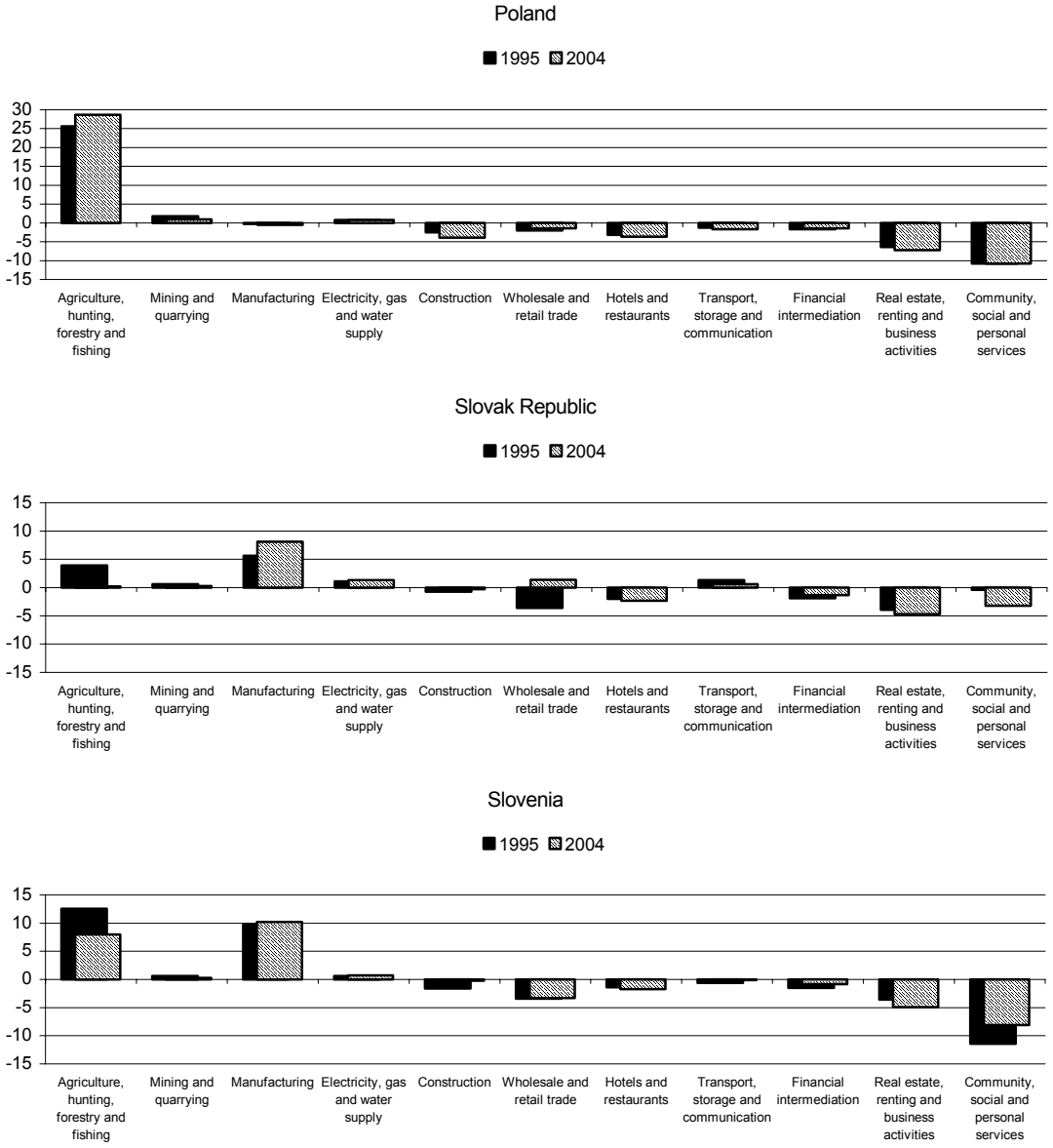


Figure 3.3 contd.

[12] The high share of hours worked in Poland distorts the figures for the other sectors. These high shares partly result from data as well as methodological problems (see Section 5 for details).

Figure 3.3 (contd.)



Source: Own calculations based on EU KLEMS database.

3.2 A more detailed view on structural shifts

The period 1995-2004 covered by the EU KLEMS database is thus characterized by a moderate pace of restructuring in most CEE countries at the broader sectoral level. Let us now discuss the relevance of structural change at a more detailed industry level (53 industries) provided by the EU KLEMS database (see Appendix Tables A.3.2 to A.3.5 for details). Table 3.1 presents some indicators on structural deviation and the speed of change for the number of employed persons, hours worked and value added. Structural deviation is measured as

$$S = \sum_i \left(s_{i,1995} \left(s_{i,2004} - s_{i,1995} \right)^2 \right)^{0.5}$$

where $s_{i,t}$ denotes the share of the respective variable.

The change in shares squared is weighted by the initial share; a larger value thus indicates more structural turbulence.

As a second measure we present the speed of structural change measured as

$$S = \sum_i \left| s_{i,2004} - s_{i,1995} \right|$$

Again, a higher value indicates a more rapid structural change having occurred over the period considered.

Table 3.1

Indicators of structural change

	Structural deviation			Speed of change		
	Employment	Hours worked	Value added	Employment	Hours worked	Value added
Czech Republic	0.32	0.32	0.35	0.19	0.19	0.23
Hungary	0.40	0.41	0.40	0.24	0.24	0.25
Poland	0.38	0.34	0.41	0.20	0.18	0.24
Slovak Republic	0.47	0.48	0.37	0.26	0.25	0.26
Slovenia	0.39	0.51	0.28	0.19	0.22	0.18
EU-10	0.23	0.23	0.14	0.12	0.12	0.09

Source: EU KLEMS database; own calculations.

These indicators of structural change show that, in terms of employment and hours worked, the Slovak Republic experienced the strongest structural change, followed by Hungary, Slovenia and Poland. With respect to value added, the indicator is highest in Hungary, Poland and the Slovak Republic. In particular, all countries experienced more structural change over that period than the EU-10 countries. This holds for the measure of the speed of structural change as well, where the indicators in the CEE countries are more or less twice as high as in the EU-10.

However, despite a largely unspectacular speed of overall structural change in this period (albeit higher than in the EU-10) one can still observe marked differences at a more detailed level as indicated by the evolution of individual sectoral shares. Figures 3.4a-3.4e present the differences to the EU-10 in 1995, together with the changes in value added shares over the period 1995-2004 in percentage points; the industries are sorted according to the former variable.

Generally, one observes structural convergence in all countries: industries being underrepresented as compared to the EU-10 (negative bars) gained in terms of value added shares over this period, while in industries being overrepresented in relative terms

Figure 3.4a **Structural differences and changes in value added shares: Czech Republic**

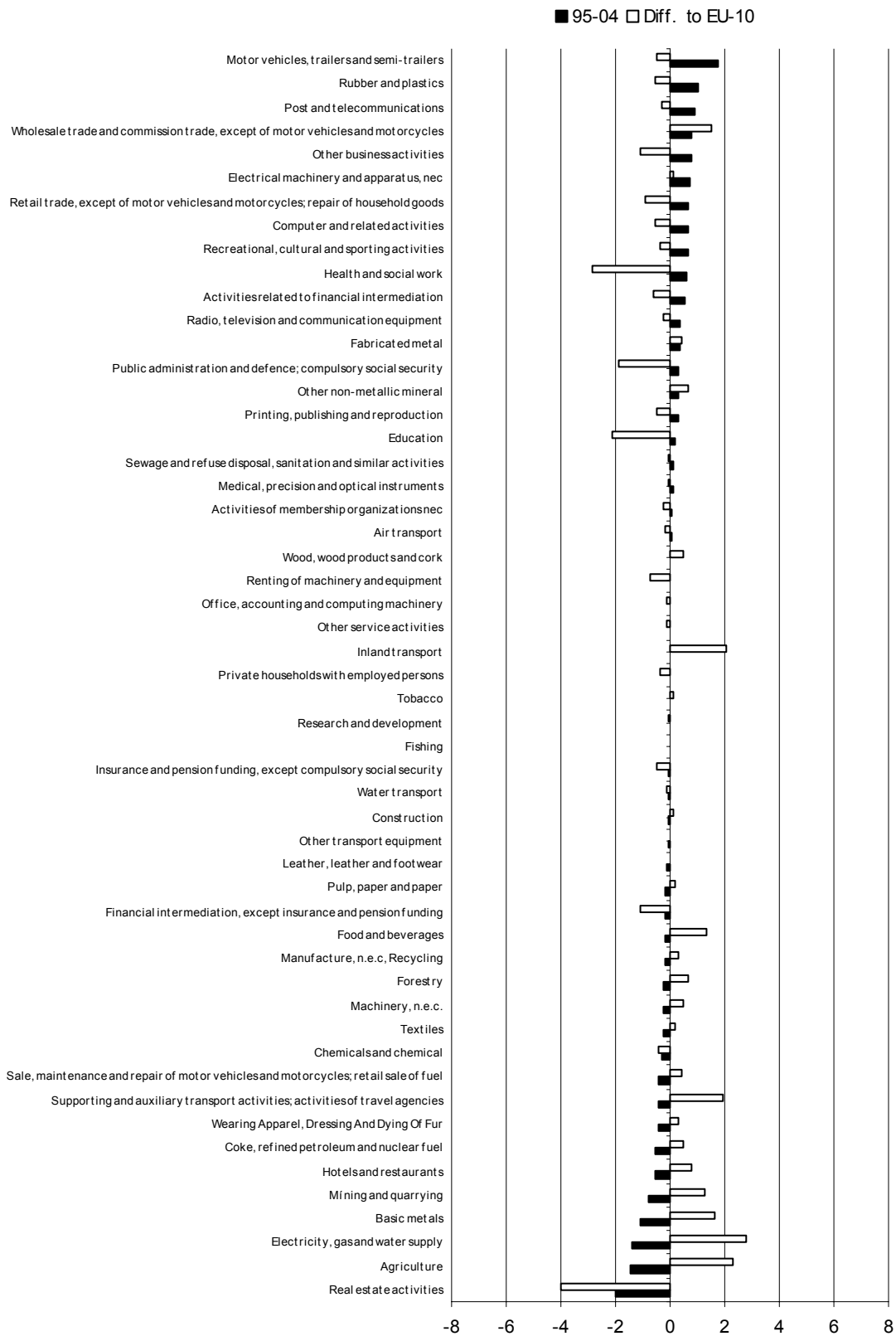


Figure 3.4b **Structural differences and changes in value added shares: Hungary**

Figure 3.4c **Structural differences and changes in value added shares: Poland**

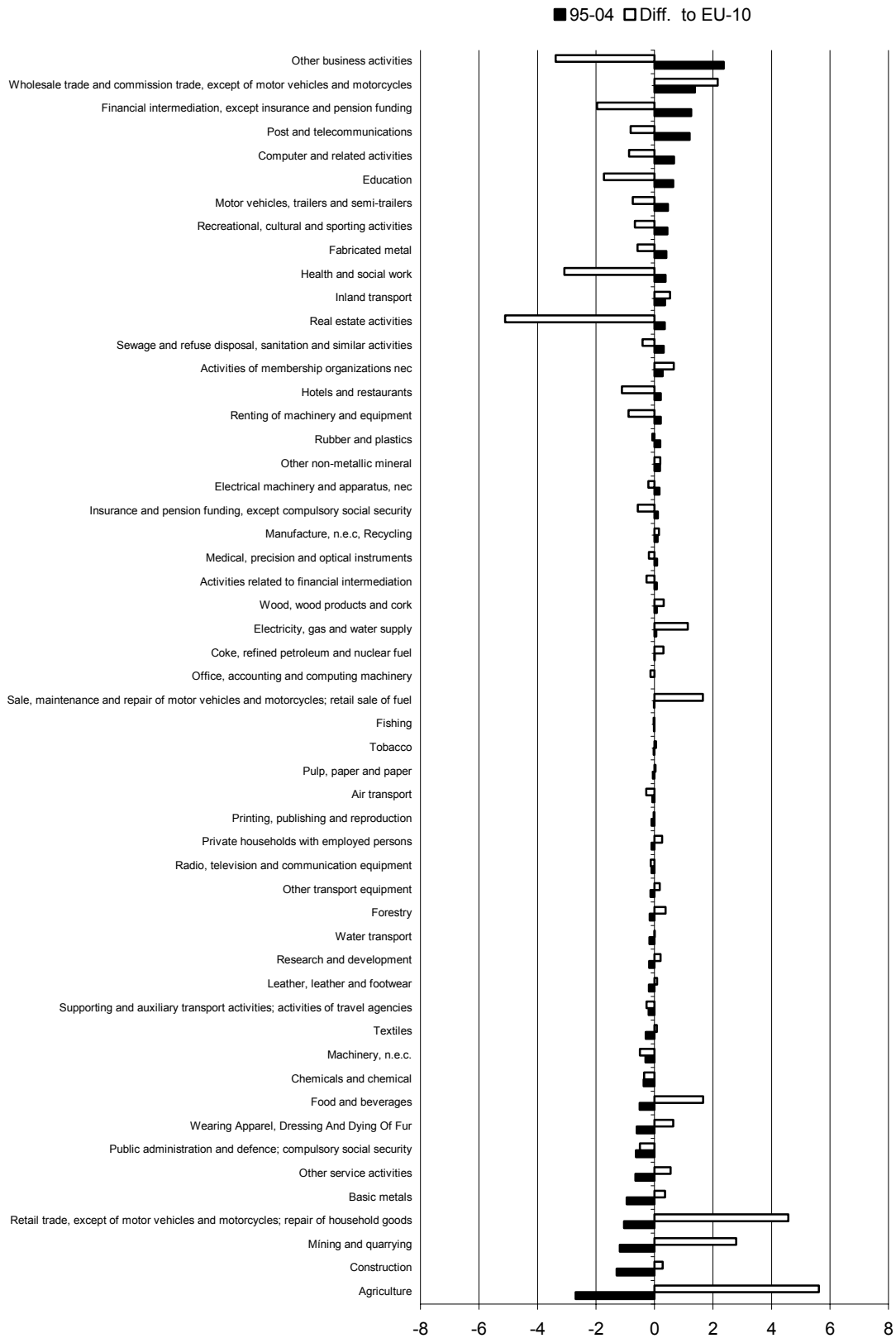


Figure 3.4d **Structural differences and changes in value added shares: Slovak Republic**

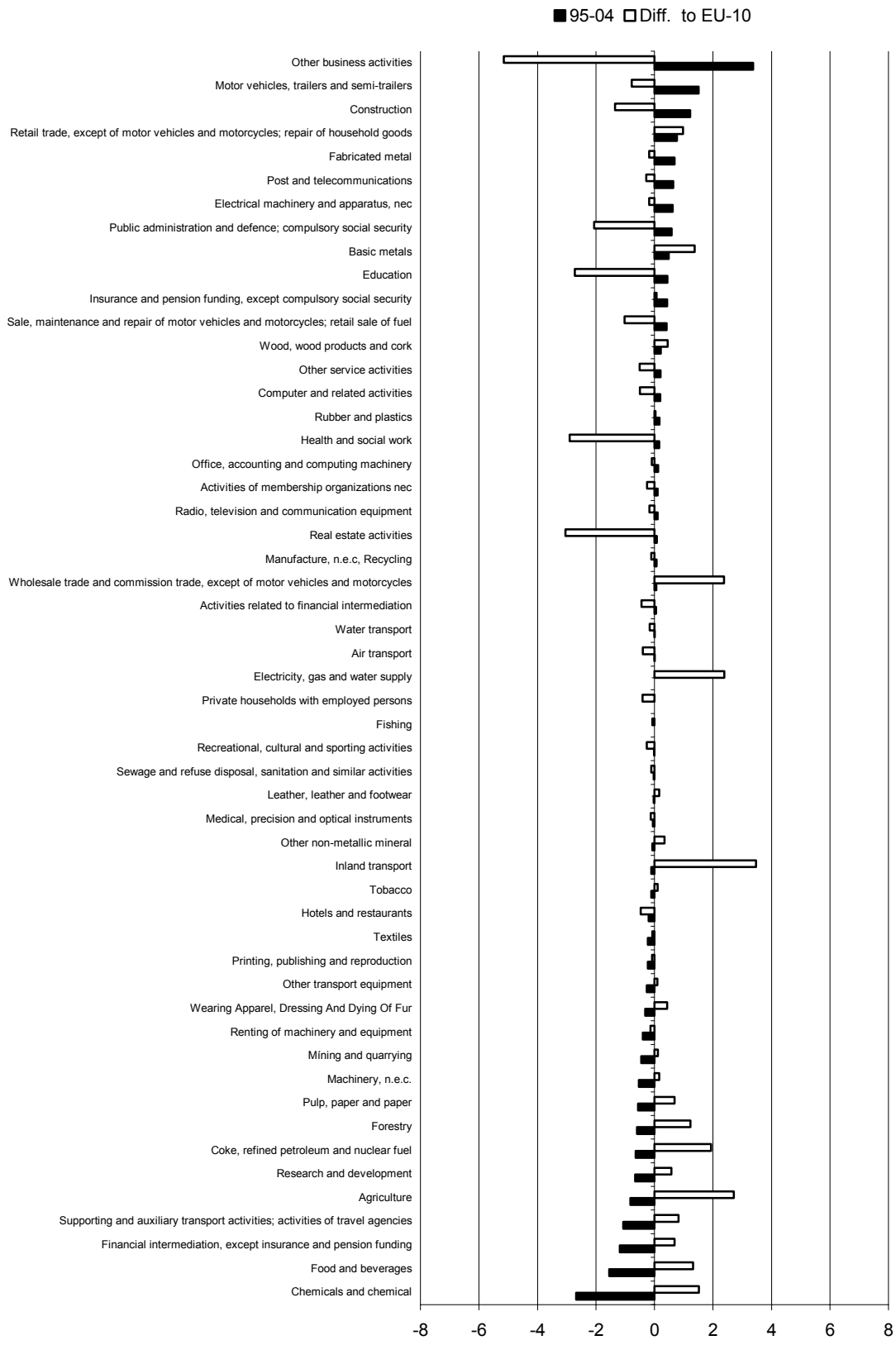


Figure 3.4e **Structural differences and changes in value added shares: Slovenia**

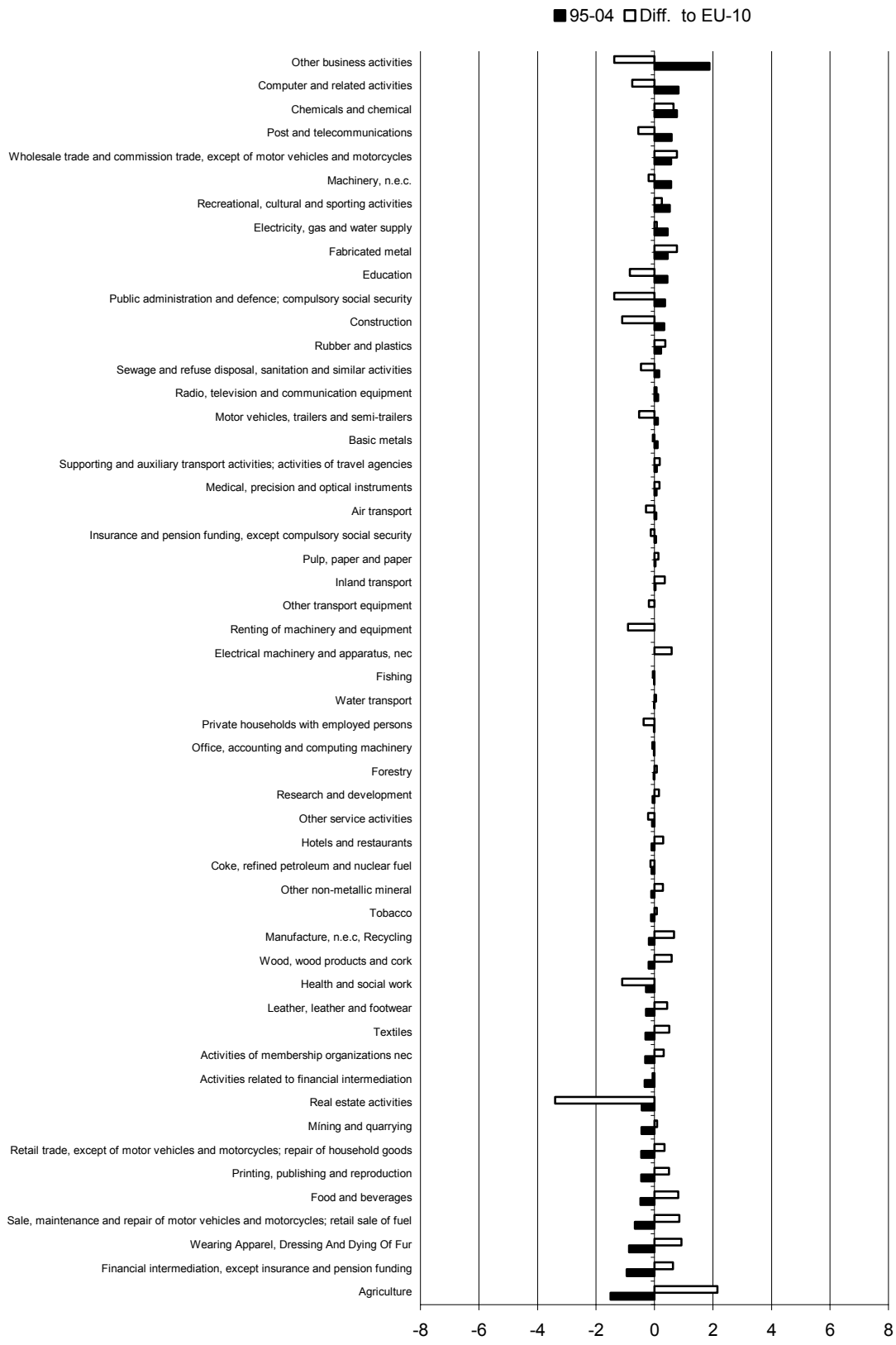
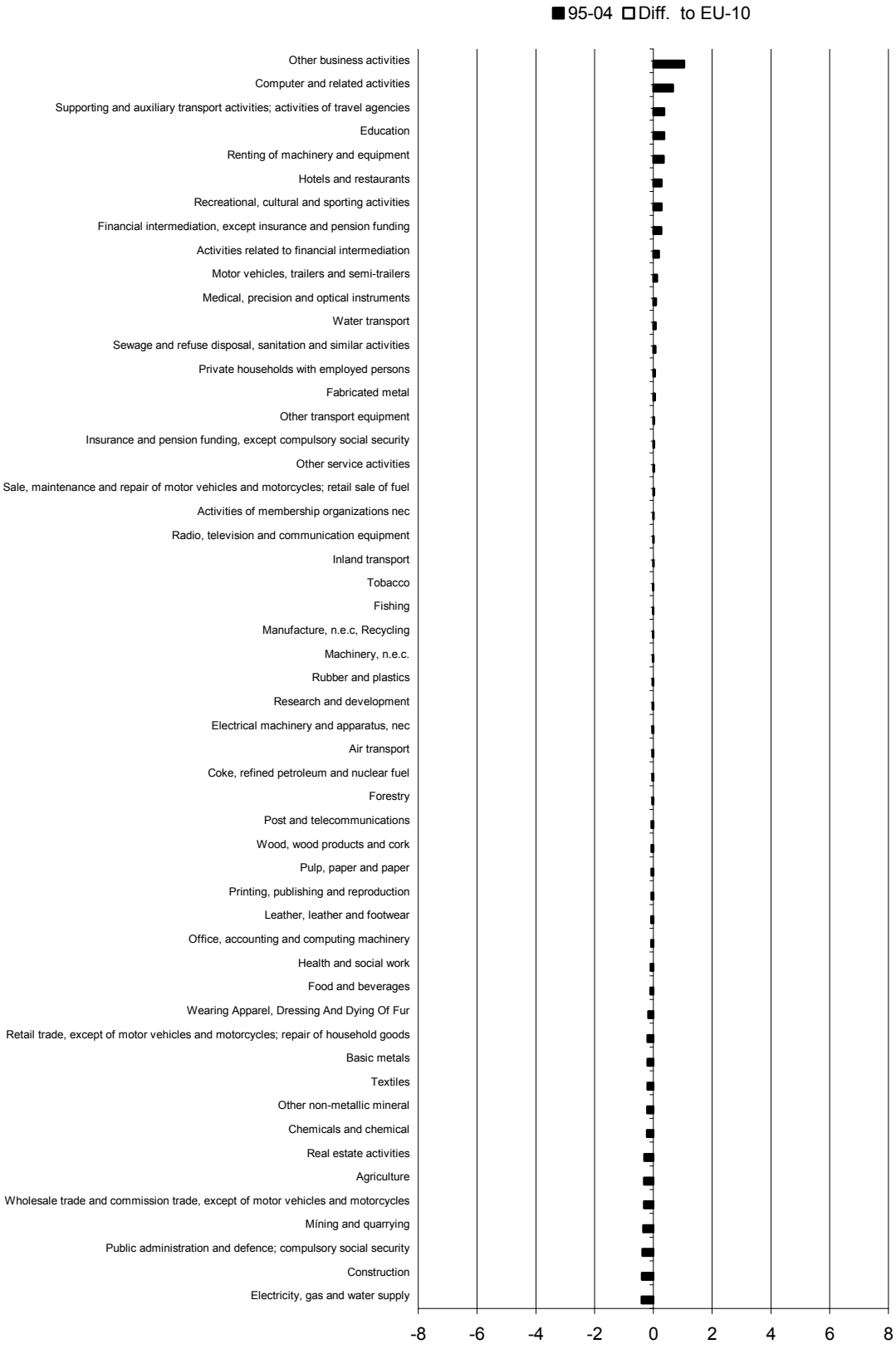


Figure 3.4f

Changes in value added shares: EU-10



the value added shares declined. The gaining industries are in most countries higher-tech manufacturing industries (such as Motor vehicles and semi-trailers, Electrical machinery and apparatus, n.e.c.) or services industries such as Computer and related activities, and business activities. Conversely, the losing industries are mainly lower-tech industries such as Chemicals and Basic metals, although there are country-specific differences.

Finally, the magnitude of the ongoing changes can be compared to the changes in the EU-10 country group over the period 1995-2004 which are presented in Figure 3.4f. The latter graphically confirms the result above – that structural turbulence was higher in the Central and Eastern European countries as the magnitude of changes is much lower in the EU-10. One exception to this might be Slovenia where the ongoing structural changes were less dramatic.

4 Productivity and specialization patterns in manufacturing industries

As we have seen in Section 2, the manufacturing industries along with distribution services have been the most important sectors in terms of value added growth and contribution to (labour) productivity growth. The other sectors have played a much less important role. On the other hand, the manufacturing sector has contributed only very modestly, and in some cases even negatively, to employment growth, as will be discussed in Section 5. In this section we look in more detail at the developments of this sector as it played a vital role in the restructuring process in the transition period.

4.1 The relative importance of the manufacturing sector

Let us first look at the relative importance of this sector with respect to the share of output, value added and employment in the total economy. Table 4.1 presents the shares of this sector for the five CEE countries under consideration and for the EU-10 (see also results in Section 3).

The first striking fact is that manufacturing played, and still plays, a much larger role in the Central and Eastern European countries than in the EU-10 group. This is the case for all three indicators over the whole time period. The only country which might be an exception is Poland, where agriculture still plays an important role and pushes the shares of manufacturing (particularly regarding hours worked) downward. For the other countries, the gross output share of manufacturing was about 4 to 7 percentage points above that for the EU-10. Furthermore, the EU-10 experienced a slight decline of this share by about 1 percentage point whereas the respective shares have been increasing in the Czech Republic, Hungary and to a lesser degree in the Slovak Republic. Only in Slovenia was the manufacturing gross output share falling by one percentage point during that period. Similarly, the share of value added in manufacturing was higher in all CEE countries in

1995 and the distance to the EU-10 was somewhat lower than in the case of gross output. Over time, the share for the EU-10 group was falling by about 1 percentage point but again increasing in the Czech Republic. In the other countries the value added share was either relatively constant (Hungary and Slovenia) or falling (Poland and the Slovak Republic). The difference to the gross output shares indicates that an increase in intermediate inputs was important in CEE countries' manufacturing.

Table 4.1

Shares of manufacturing sector in total economy

	Gross output			Value added			Hours worked		
	1995	**2000**	**2004**	**1995**	**2000**	**2004**	**1995**	**2000**	**2004**
Czech Republic	35.7	39.4	39.6	24.3	26.8	25.6	26.5	26.9	26.8
Hungary	35.2	43.0	38.9	22.3	24.1	22.5	23.4	24.1	22.8
Poland	32.2	29.9	32.6	21.1	18.5	19.2	19.3	17.2	16.2
Slovak Republic	37.5	36.9	38.5	26.8	24.7	23.6	25.2	24.6	24.8
Slovenia	37.8	38.1	36.8	26.4	26.5	25.7	29.4	27.6	26.9
EU-10	31.0	31.8	30.2	20.0	20.1	18.8	19.6	18.4	16.7

Source: EU KLEMS; own calculations

It is also worth taking a closer look at the structural dynamics within the manufacturing sector. Figures 4.1 and 4.2 present the shares of individual industries within manufacturing. Figure 4.1 presents these shares in terms of value added and Figure 4.2 in terms of hours worked.[13] Let us highlight just the most striking developments. In all countries there was a strong decline in the value added shares of the industries 'Food, beverages and tobacco' and 'Textiles, leather and footwear'. 'Chemicals, rubber, plastics and fuel' also declined strongly in Hungary and the Slovak Republic where this industry had taken quite a large share in 1995; however, it strongly increased in Slovenia. Another larger sector, 'Basic and fabricated metals', declined in the Czech Republic, Hungary and to a lesser extent in Poland, but increased strongly in the Slovak Republic and – less markedly – in Slovenia. In some countries, particular in Hungary, but also in the Czech and Slovak Republics, there was a strong increase in the industries 'Electrical and optical equipment' and 'Transport equipment'. This also happened in the other countries but the magnitudes were less spectacular. These structural changes show the successful restructuring process going on in the transition economies.[14] Most of the countries have now reached or even surpassed

[13] Corresponding figures can be found in Appendix Tables A.4.1.a (for gross output shares), A.4.1.b (value added shares) and A.4.1.c (shares of hours worked).

[14] Initially, the 'winner' manufacturing branches (in terms of relative output growth rates during 1990-1992) were food and beverages, paper, wood, chemicals and rubber and construction materials, whereas 'loser' branches included not only textiles and leather, but also electrical and optical equipment as well as machinery and transport equipment. This pattern of industrial structural change changed almost completely thereafter, both at the aggregate level as well as with regard to individual industries: the process of de-industrialization came to an end in most CEECs and manufacturing became an engine of growth. In particular, many former 'loser' industries turned into winners and vice versa (Urban, 2000).

Figure 4.1

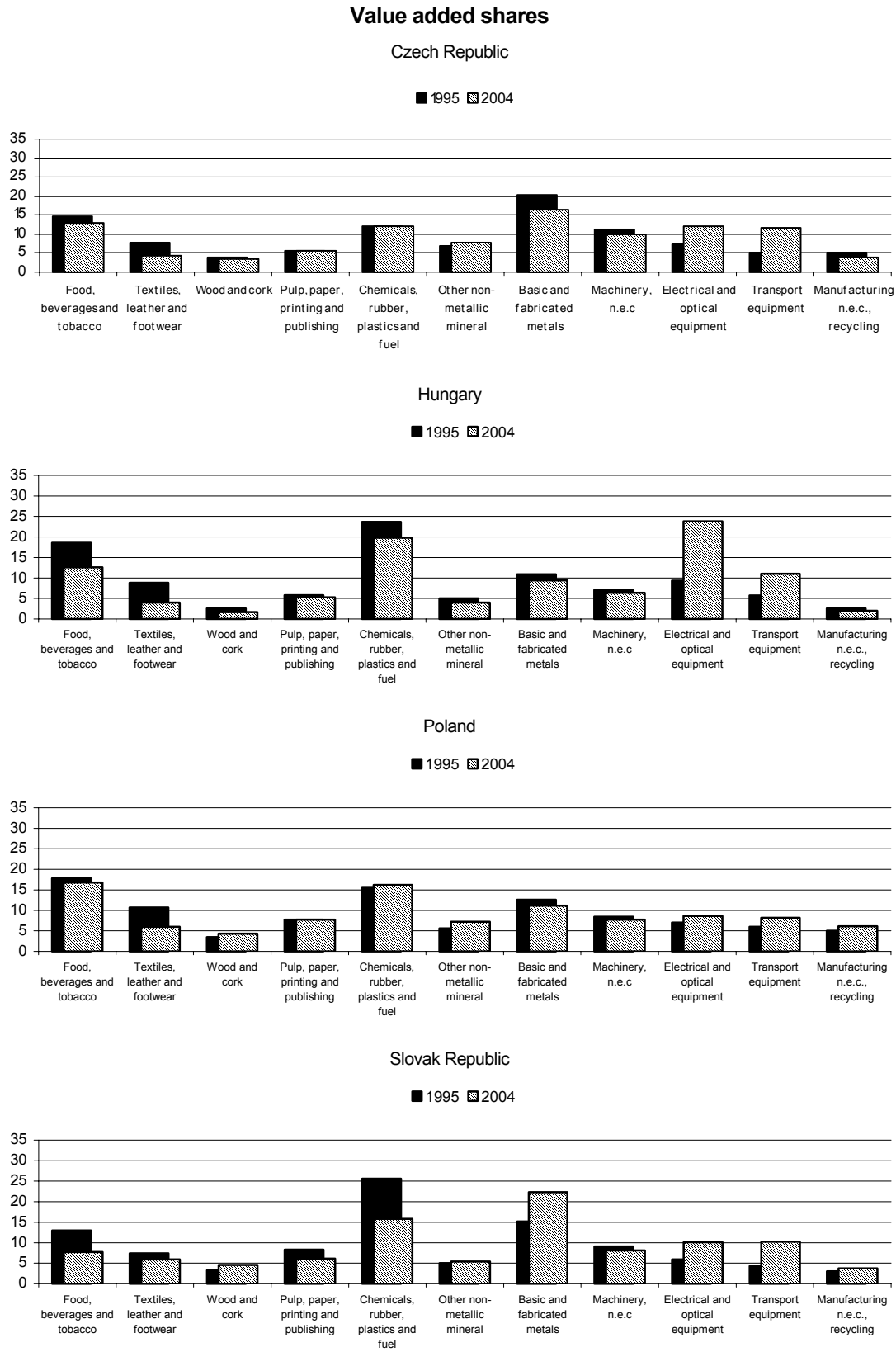


Figure 4.1 contd.

Figure 4.1 (contd.)

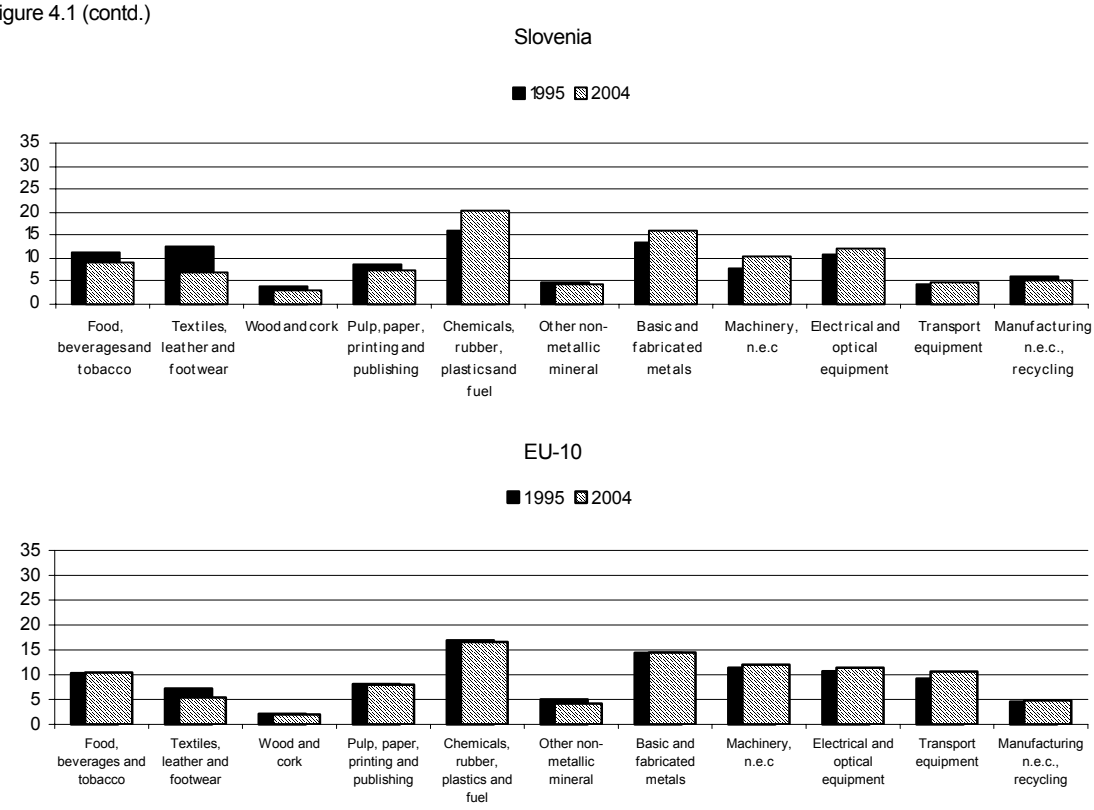


Figure 4.2

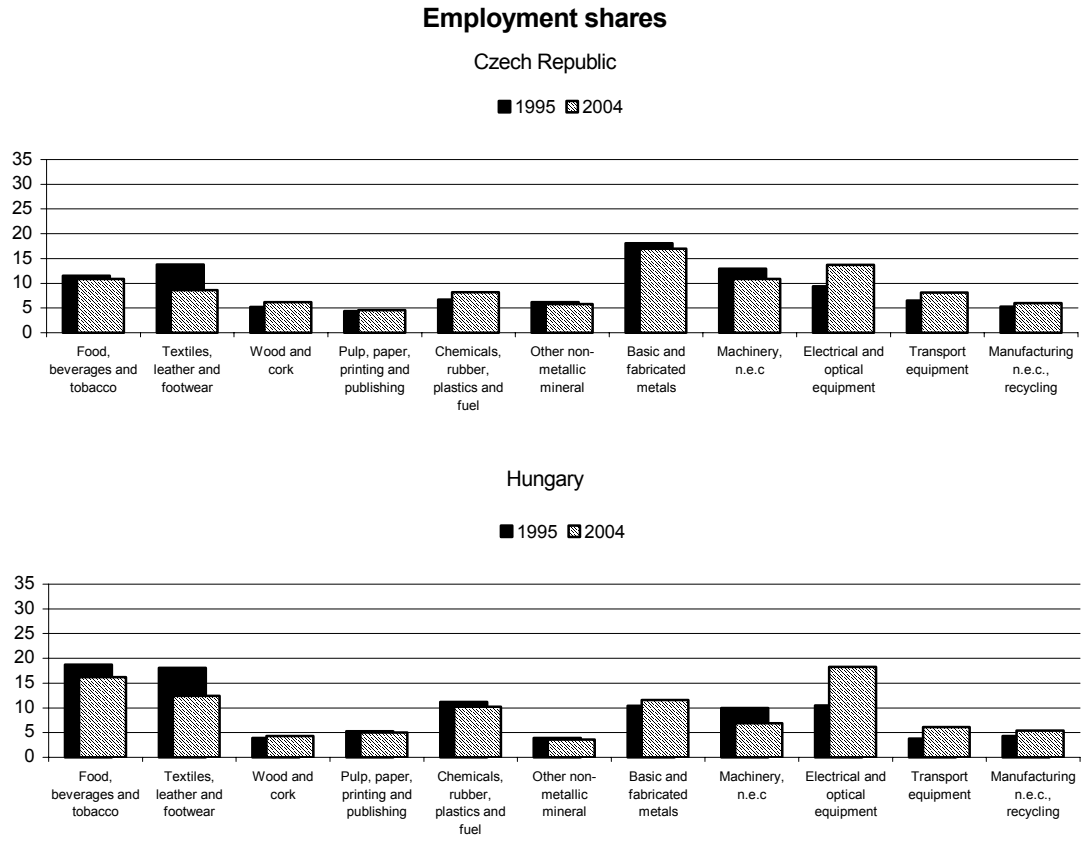


Figure 4.2 contd.

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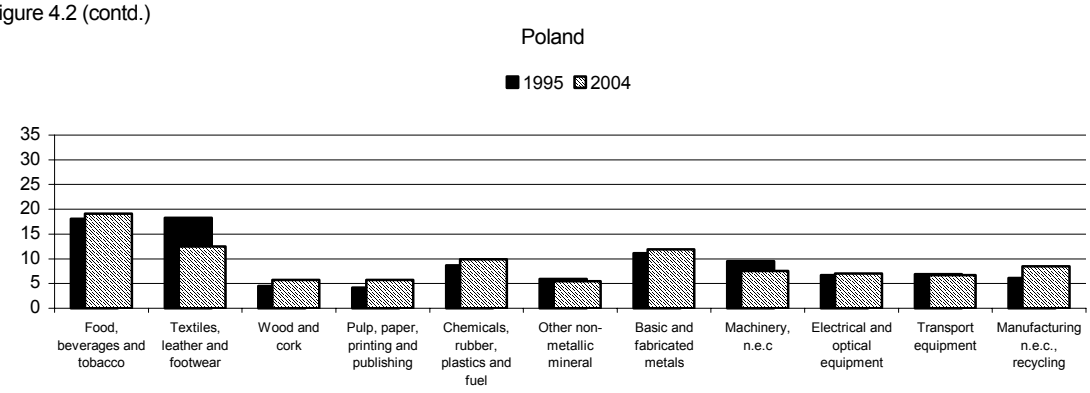
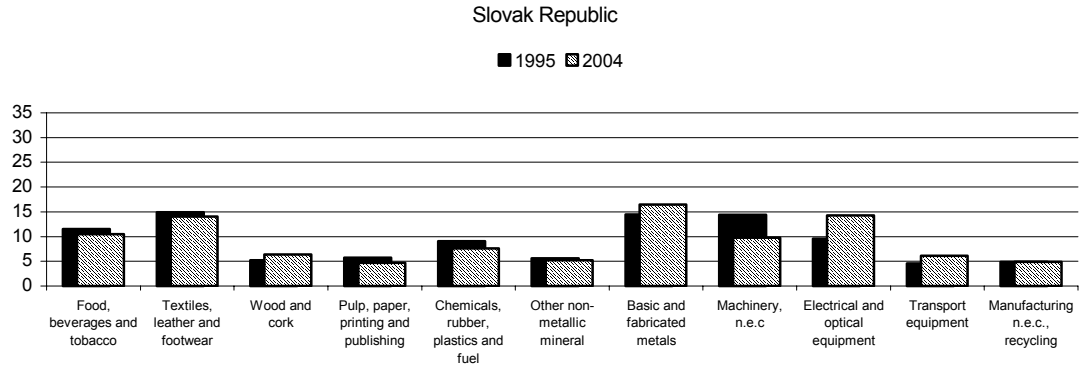
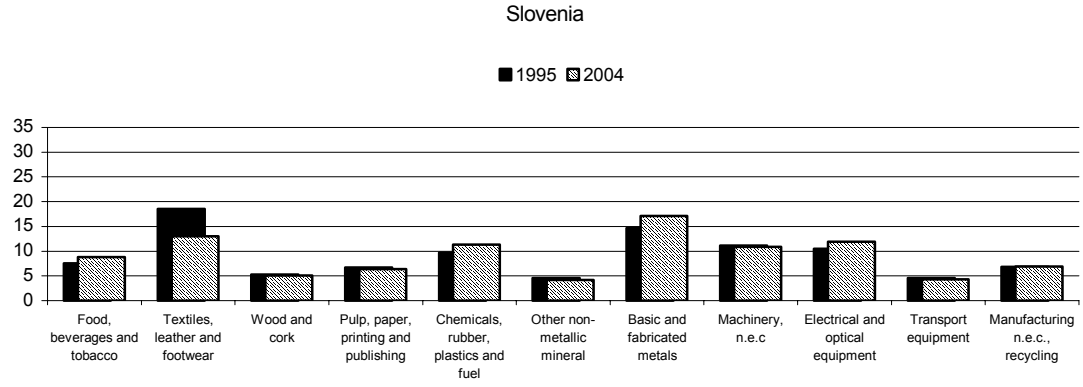
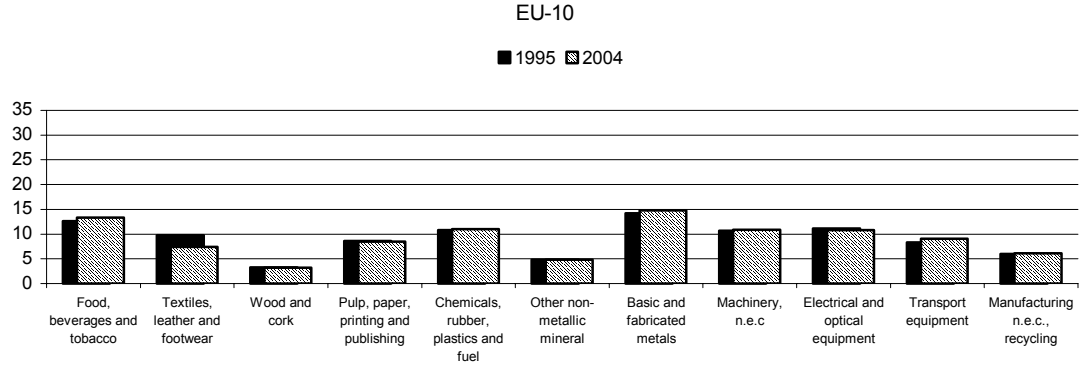








the shares of the EU-10 in the higher-tech industries. The reasons behind that rapid structural change are the fast adjustment to Western technological standards, which in turn was made possible by the highly educated workforce, the geographical closeness to Western markets and the fact that some of these CEE countries have been targeted either for outsourcing or FDI of Western economies. Similar structural changes, although less pronounced, can be observed when looking at the shares of hours worked. This is explained by the strong increases in (labour) productivity, as already outlined in Section 2 and discussed in more detail in the next subsection for the manufacturing industry.

4.2 Productivity dynamics in the manufacturing sector

Next, let us analyse manufacturing productivity growth in more detail, as this sector played a crucial role in the restructuring process of Central and Eastern European countries. Table 4.2 presents growth rates of various variables for total manufacturing in the economies concerned.

Table 4.2

Average annual growth rates in manufacturing in %, 1995-2004

	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
Gross output	6.72	9.18	6.70	6.12	4.78	2.16
Intermediate inputs	7.55	10.36	6.66	6.29	4.33	2.56
Value added	3.66	5.37	6.20	5.57	4.95	1.26
Employment	-0.36	0.54	-2.44	-1.24	-1.68	-0.74
Hours worked	-0.68	0.23	-2.48	-1.37	-1.44	-0.97
High-skilled	1.06	2.32	3.27	-0.39	1.59	2.82
Medium-skilled	-0.36	0.53	-2.77	-0.84	-1.23	-0.50
Low-skilled	-3.98	-1.46	-5.47	-7.67	-3.00	-3.43
Labour productivity	4.34	5.13	8.68	6.95	6.39	2.24
MFP (value added)	1.31	3.20	7.00	.	4.10	0.91

Source: EU KLEMS database; own calculations.

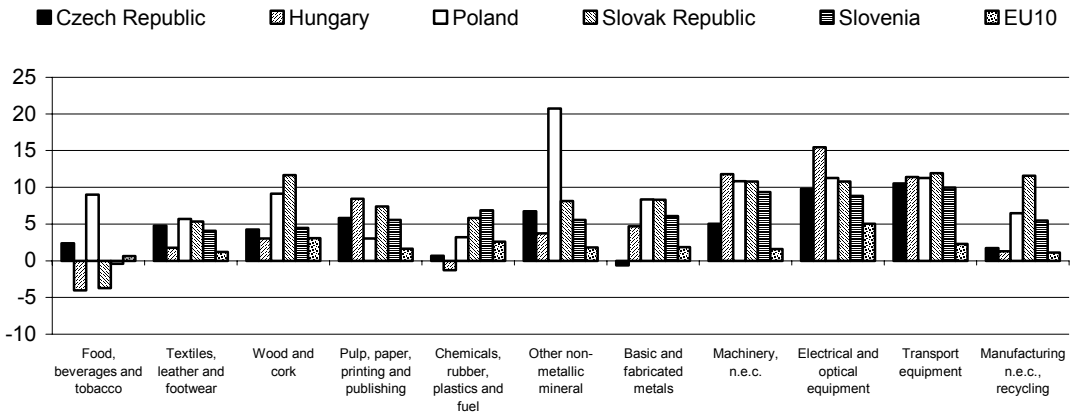
Again, the broad patterns of performance discussed above – fast growth of output, value added and productivity coupled with declining employment (the latter with the exception of Hungary) – can be observed for the total manufacturing sector as well (see also Section 5 for details) and we thus shall not go into details here. Let us mention only the much faster productivity growth in the CEE countries' manufacturing industry as compared with the EU core economies. Not only labour productivity growth but also multifactor productivity (MFP) growth was higher in the CEE countries than in the West European core economies. The difference in the growth of labour productivity relative to the EU-10 was between 2 percentage points (Czech Republic) and more than 6 percentage points (Poland). A similar but far less spectacular difference can be found for multifactor productivity (except Poland). For the CEE economies this reflects a strong catching-up process and points to a

strengthening of their position in the European pattern of broader specialization in the manufacturing industry.

Apart from the overall manufacturing performance, it is even more interesting to look at industry details. Figure 4.3 presents the growth rates of labour productivity. Appendix Tables A.4.4 present labour productivity and multifactor productivity growth rates for industries within manufacturing.

Figure 4.3

Growth rates of labour productivity in manufacturing branches



Source: EU KLEMS database; own calculations.

Although there is a wide variety of branch-specific patterns, the striking feature is that the productivity growth differential between most CEE countries and the EU core economies was particularly high in the more technology-intensive sectors such as Machinery, Electrical and optical equipment and Transport equipment. In some of those sectors the growth differential in labour productivity was as much as 10 percentage points, with especially Hungary, Poland and the Slovak Republic outperforming the others. The transport equipment sector in particular – dominated by foreign investments – shows large growth differentials in labour productivity growth in all five CEE countries. On the other hand, the productivity growth differentials in the lower-tech sectors range from 2 to 6 percentage points on average and thus are much lower.[15]

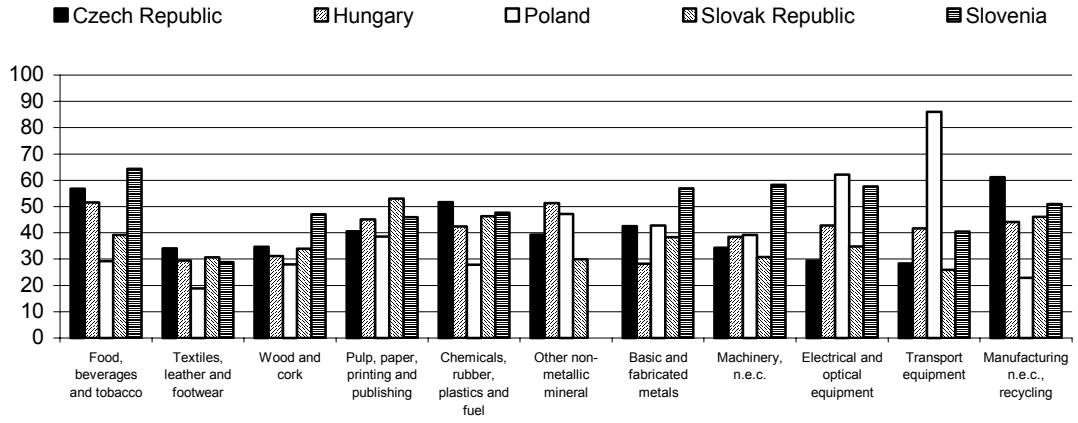
That pattern of productivity catching-up may be explained either by different convergence trajectories or by the structure of the initial productivity gaps, which are shown in Figure 4.4 (for detailed numbers see Appendix Table A.4.3). In the first case industries might be characterized by different convergence parameters whereas in the second case productivity growth due to catching-up might differ only because of differences in the size of the initial gaps. Landesmann and Stehrer (2003) referred to these two cases as 'strong

[15] For a more detailed analysis see Havlik (2005a).

Gerschenkron effect' and 'weak Gerschenkron effect', respectively. The figure presents the productivity levels in per cent of Austria in 1995. In the case of a significant catching-up process – in the sense that industries with a higher initial gap are growing faster – one would expect higher productivity growth rates in sectors with higher initial gaps (under the assumption of equal convergence parameters). However, variations across countries reveal no clear-cut pattern of the initial gap being higher in the higher-tech sectors.[16] As productivity growth relative to the Western countries was nonetheless larger in the higher-tech sectors, the latter were characterized by a higher catching-up parameter.

Figure 4.4

Initial productivity levels (in % of Austria), 1995



Source: EU KLEMS database; own calculations.

As the catching-up process is faster in the higher-tech sectors whereas the pattern of wage growth is more even across industries, this leads to a change in the structure of unit labour costs and relative unit labour costs as compared with the Western economies. Over time this implies that the comparative cost advantage of catching-up economies is gradually shifting towards the higher-tech sectors (see Landesmann and Stehrer, 2003, and Havlik, 2006, for details). In the particular case of the Central and Eastern European economies, these changing patterns of comparative advantage have (at least until recently) further been supported by the availability of skilled workers, in particular well-trained technicians. The large scope for productivity growth, the well educated workforce and the successful strategy of these countries of remaining cost competition also attracted FDI and stimulated outsourcing activities, which again were concentrated mainly in the higher-tech sectors of manufacturing (see, e.g., Hunya, 2000, for a study on FDI patterns, and Ng and Kaminski, 2001, for a detailed study of trade and production fragmentation). These dynamics resulted in the specialization of these countries in the higher-tech sectors, notably in transport

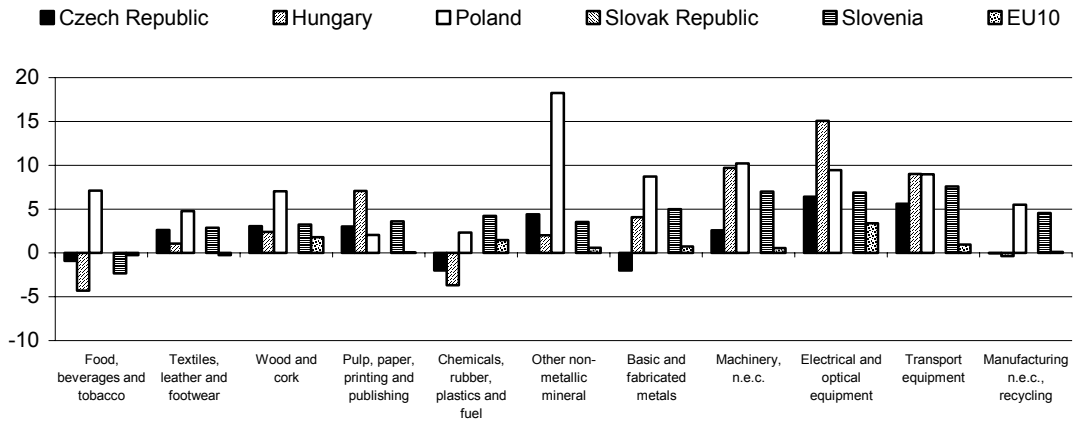
[16] An earlier paper (Monnikhof and van Ark, 2002), using industry-specific conversion factors (unit value ratios, UVR) for comparing manufacturing productivity levels, arrived at similar conclusions for the Czech Republic, Hungary and Poland (see also Havlik, 2005b).

equipment in the Czech Republic, Hungary and the Slovak Republic, and in electrical and optical equipment in Hungary and the Slovak Republic. The change in structures has been less dramatic in Slovenia, which has undergone a more balanced path of restructuring. A similar dynamic can be found when looking at shifts in the patterns of trade flows (see Landesmann and Stehrer, 2003, for details).

A similar pattern of productivity growth rates can also be found when looking at multifactor productivity instead (see Figure 4.5). Again, the growth rates are higher in the higher-tech sectors.

Figure 4.5

Growth rates of multifactor productivity (1995-2004)



Source: EU KLEMS database; own calculations.

Table 4.3

Average annual growth rates of capital services in %, 1995-2004

	IT capital services				Non-IT capital services			
	Czech Republic	**Hungary**	**Slovenia**	**EU-10**	**Czech Republic**	**Hungary**	**Slovenia**	**EU-10**
Food, beverages and tobacco	12.5	11.5	15.8	9.5	4.0	-2.4	4.3	0.8
Textiles, leather and footwear	11.9	11.6	18.4	7.7	1.0	-2.6	2.9	0.1
Wood and cork	17.0	12.9	20.9	8.4	4.9	0.6	3.3	1.8
Pulp, paper, printing and publishing	18.0	14.0	16.2	11.1	4.7	0.8	2.8	1.6
Chemicals, rubber, plastics and fuel	15.9	18.1	18.0	8.9	6.0	2.8	5.5	1.4
Other non-metallic mineral	11.8	15.1	20.3	8.1	2.8	2.4	2.7	1.6
Basic and fabricated metals	8.9	17.9	22.0	10.2	1.8	0.6	2.8	1.5
Machinery, n.e.c.	14.1	18.8	21.1	8.8	4.9	3.5	7.6	1.1
Electrical and optical equipment	23.6	13.5	17.7	12.5	12.1	6.9	6.1	2.2
Transport equipment	14.0	20.4	15.1	11.6	12.0	8.5	9.0	2.9
Manufacturing n.e.c., recycling	12.6	23.9	5.2	9.5	5.4	10.0	0.9	1.6

Source: EU KLEMS database; own calculations.

These high growth rates of labour productivity (but also of multifactor productivity) in the high-tech industries can also be driven by investment in capital and IT capital in particular. Table 4.3 shows the growth rates of the IT and non-IT capital services over this period (data are not available for Poland and the Slovak Republic).

As one can see, growth rates of (both IT and non-IT) capital services are generally higher than in the EU-10 country group. However, there is no significant pattern of higher growth rates of IT capital services in the higher-tech sectors. But the growth rate differential for this type of capital vis-à-vis the EU-10 group is higher than for non-IT capital services. On the other hand, there is a significant difference in the growth of capital services in the industries 'Electrical and optical equipment' and 'Transport equipment', where growth rates are much higher than in the other manufacturing industries, particularly so in the Czech Republic and Hungary.

Thus, these five Central and Eastern European economies successfully transformed their manufacturing sectors towards higher-tech and skill-intensive sectors within a relatively short period.

5 Shifts in employment structures and skills

As already illustrated in Section 2, all transition countries in the CEE region (excepting Hungary, which reduced employment earlier) experienced an overall reduction of employment in the period 1995-2004. In this section we first present the structural shifts of employment and hours worked and, second, the effects of the changes in labour quality based on the growth accounting framework. In particular we are going to present the contributions of changes in skills to shifts in labour composition for the total economy as well as for selected industries.

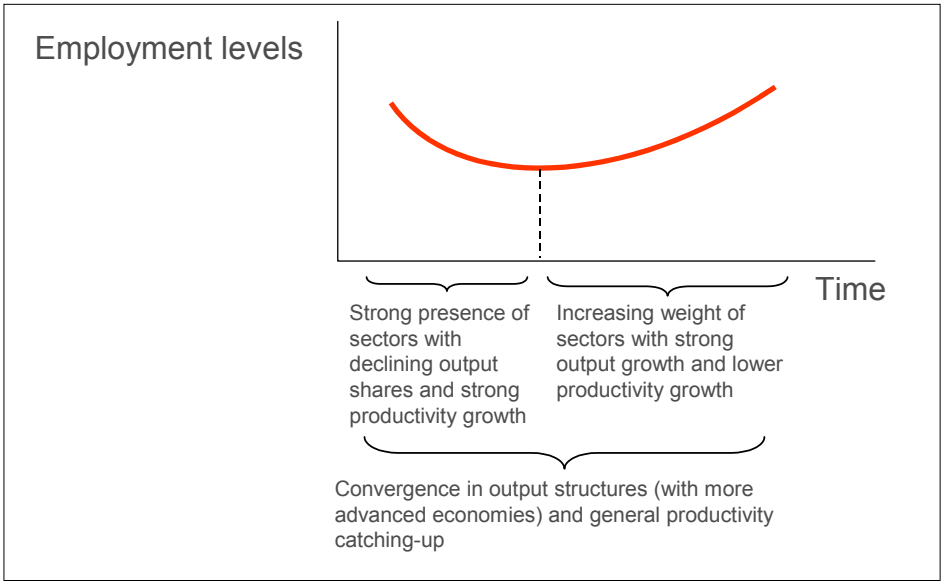
5.1 Changing patterns of employment and hours worked

Sectoral employment developments in the transition countries have been strongly affected by the legacy of the sectoral structures inherited from the Communist period, with its heavy emphasis on industry and the relative neglect of service activities, combined with a path of convergence in output structures and catching-up in productivity levels, both of which resulted in a convergence of employment structures with the more advanced EU economies (see Sections 3 and 4 above). The impact of these structural adjustments on the development of aggregate employment levels can be described in a stylized way (for details see also Stehrer, 2005, and Landesmann and Vidovic, 2006). Here the aggregate development is characterized as a 'U-shaped' pattern, where the initial downward sloping phase features first strong productivity growth above the level of output growth and second

a contraction of sectors which have initially a strong weight in the transition economies' sectoral structures (industry and agriculture – Figure 5.1).

Figure 5.1

Stylized U-shaped pattern of employment growth

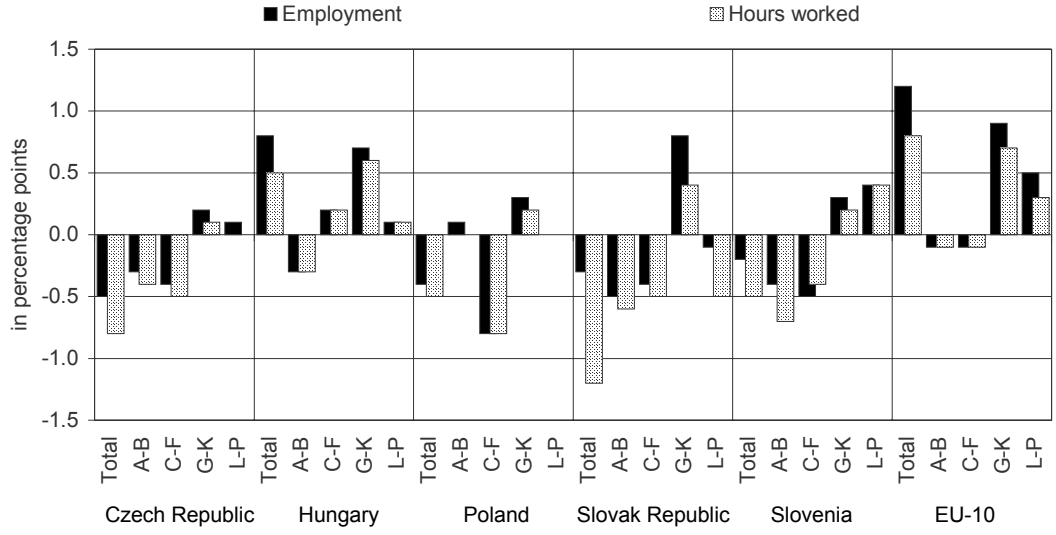


As initial productivity levels were also particularly low in these sectors (in agriculture this is true, e.g., for Poland where farm sizes are rather small, but not for other countries such as the Czech Republic) there was large scope for productivity catching-up and hence, as productivity growth proceeded, also large scope for reducing redundant labour. The sectors which were 'under-represented' as compared to developed market economies – particularly market services – still have a smaller weight and, though they generate new jobs, this does not compensate for the employment losses in the contracting sectors. Over time, however, the weight of these sectors increases and that of the contracting sectors falls. Furthermore, the employment elasticities are higher in the services sectors leading to a gradual recovery of aggregate employment levels. Finally, the successful catching-up process implies that productivity growth rates are becoming lower and thus less labour is being laid off. At relatively constant output growth rates this again implies a recovery of employment growth. There are many additional features accompanying these processes, such as skill- and age-group mismatches, temporary labour hoarding phenomena especially in agriculture, positioning in the international division of labour etc., but the actual developments and the positioning of different economies along the U-shaped pattern – which is dependent on the initial starting points of sectoral composition and initial productivity levels as well as on the progress in relation to output convergence and sectoral productivity catching-up – seems to support the stylized picture of what underlies aggregate employment developments in transition countries.

From the general development of total employment in CEE countries as illustrated in Section 2, one can conclude that, although output was already rising from 1995 onwards, it was outpaced by the growth in labour productivity and the above-outlined structural changes resulting in falling employment in Slovenia, the Czech and Slovakia. In Poland an economic downturn at the end of the 1990s led to a sharp reduction in employment as well. Hungary, where employment had fallen before, was the only country experiencing employment growth throughout the period 1995-2004 which was comparable to that in the EU-10 region (see Figure 5.2). Only recently – together with accelerated GDP growth – employment growth picked up in all CEE countries, resulting not only in a fall of unemployment but in rising employment rates as well (Gligorov, Podkaminer et al., 2007).

Figure 5.2

Contributions of main sectors to average annual growth of employment and hours worked, 1995-2004



Source: EU KLEMS Database, March 2007, http://www.euklems.net; and own calculations.

Figure 5.2 illustrates the labour shedding and gaining sectors in the CEE countries and the EU-10.[17] As can be seen, the downturn of labour demand taking place in the aftermath of the transitional crises lasted even longer and was more severe when measured in hours worked. This was particularly the case in the Czech and Slovak Republics where annual growth rates of hours worked, at -0.8% and -1.2% respectively, were the lowest. In Poland, the reduction of employment and of hours worked, at -0.4% and -0.5% per year, was similar in magnitude, whereas in Slovenia hours worked fell with a growth rate of -0.5% per

[17] Throughout this section we are going to present contributions to overall employment and hours worked growth instead of growth rates. This allows us not only to take a look at the development of the individual sectors but also to detect which industries contributed to the overall labour demand developments in these economies. Corresponding figures on growth rates of employment and hours worked also including figures at the more detailed NACE revision 1 level can be found in the Appendix. Contributions to growth are calculated by weighting average annual growth rates of individual sectors by their average share in total employment and hours worked, respectively, over time.

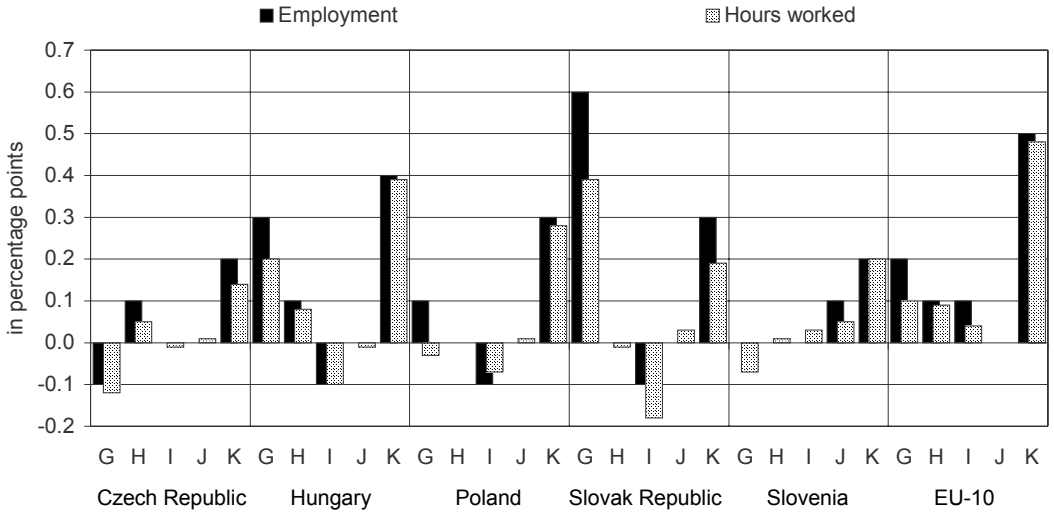
year and thus more than double compared to employment. In Hungary, the growth rate of hours worked, at 0.54%, was somewhat lower than that of employment (0.77%). One explanation for the difference between the growth rates of employment and of hours worked is that temporary contracts as well as part-time employment, which were not common in the CEE countries at the beginning of the transition period, were gaining significance, particularly in the expanding services sectors (see Landesmann and Vidovic, 2006). The shift from agriculture and industry towards services sectors also favoured shorter weekly working hours per person on average.

In all CEE countries the sectoral changes led to a shift of employment from agriculture and industry towards services. In the Slovak Republic, not only the primary and the secondary sectors but also the public service sector contributed to the overall negative development in hours worked. By contrast, labour demand in market services rose substantially. In the Czech Republic the fall of hours worked taking place in Agriculture, fishing and forestry (AtB) as well as in Manufacturing and Construction (C-F) could not be offset by the mere rise in services sector activity. The severe crisis of the Polish industry brought about an annual reduction of hours worked of -0.76%. The large agricultural sector, where hours worked remained roughly constant in the same period, may have served as a substitution possibility for the workforce, considering that between 1998 and 2002 the nation-wide unemployment rate rose from 10.6% to over 19% and remained at that level until 2004 (Gligorov, Podkaminer et al., 2007). The expansion of market services (G-K) remained low as well. In Slovenia, not only the growth in market services, but even more so the rise in hours worked in the public services sector was a driving force of the structural change in the economy. At the beginning of the period, among the CEE countries Slovenia recorded the second largest share of the workforce in the agricultural sector, with slightly more than 10%. Therefore productivity growth was likely to lead to a reduction in hours worked in the primary sector as it was the case in industry to a lower extent. In Hungary, the only country where structural changes took place in the presence of rising employment in that period, the rise in market services was also the highest. Moreover, Hungary was the only country to register growth in manufacturing employment, so that the fall of hours worked in the agricultural sector could be largely compensated. In addition, substantial growth in hours worked was observed in Construction (F), as was the case in Slovenia as well (see Appendix Table A.5.2).

Figure 5.3 reveals the detailed pattern of employment growth within the market services sector. The most striking fact is that the Business services sector (K), including renting and real estate services (NACE K), was the engine of job growth in the whole CEE region. But only in Hungary and Poland was the contribution comparable to that in the EU-10. In the Slovak Republic, Slovenia and the Czech Republic its contribution to overall sectoral shifts was only moderate with growth below 0.2% per year in terms of hours worked.

Figure 5.3

Contributions of market services to average annual growth of employment and hours worked, 1995-2004



Source: EU KLEMS Database, March 2007, http://www.euklems.net; and own calculations.

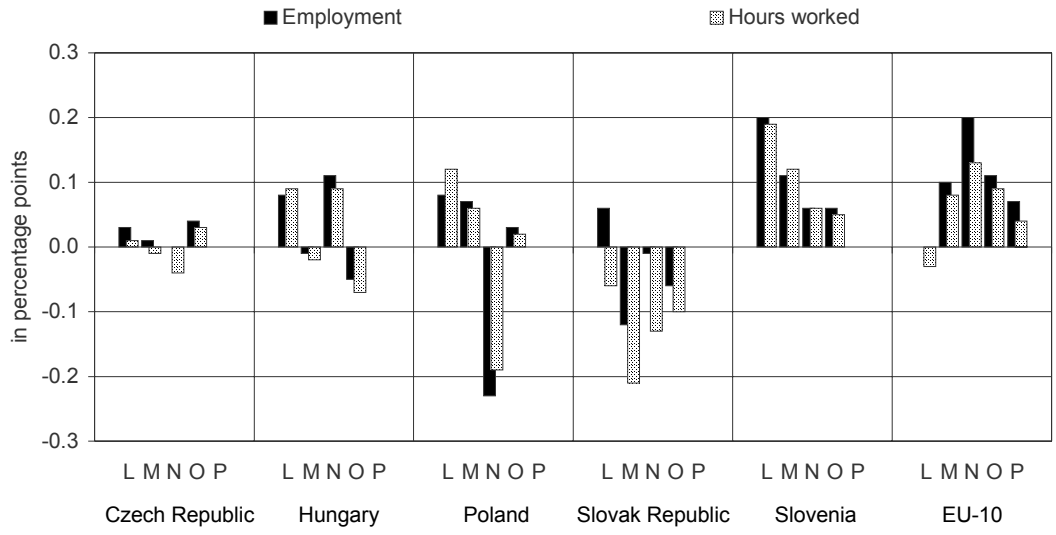
Wholesale and retail trade (NACE G), which tend to represent industries with a job creating potential, grew generally only in the Slovak Republic and to a lesser extent in Hungary, whereas in the Czech Republic, Slovenia and Poland hours worked even declined. The obvious difference between hours worked and employment development in this sector is, as already mentioned, due to the substantial rise in part-time work, also to be found in the EU-10. Minor rises of hours worked have taken place in Hotels and restaurants (NACE H), while the Transport sector (NACE I) registered a reduction in all CEE countries except Slovenia. In 1995, the share of the finance sector in the total workforce was in the whole CEE region only half of that in the EU-10. However, the average growth rates of hours worked during 1995-2004 amounted only in the Slovak Republic and in Slovenia to about 2% p.a. (see Table 5.2). In Poland and the Czech Republic growth rates were surprisingly low and even negative in Hungary.

The development of employment and hours worked in public and private services also varied in the CEE region, depending on the policies pursued by the individual governments in the countries concerned (see Figure 5.4). Nevertheless, growth contributions of public service sectors were generally low as compared to market service sectors and did not exceed 0.2% p.a. While in Slovenia hours worked expanded in all public services sectors (particularly so in Public administration, NACE L and Education, NACE M), in the Slovak Republic a reduction took place especially in Education as well as in the Health sector (NACE N). In Poland the latter industry was affected by cuts in employment whereas there were rises in Public administration and Education. In the Czech Republic, almost no changes took place in employment and hours worked in public and private services, while in Hungary an overall growth in public services was driven by rising hours worked in Public

administration and Health sectors. Due to their small size, changes in Other community and private services (NACE O and P) had only minor impacts on overall labour developments in all CEE countries. In the EU-10, during the same period, public services expanded in all sectors, except for Public administration where hours worked were even slightly reduced.

Figure 5.4

Contributions of public and private services to average annual growth of employment and hours worked, 1995-2004



Source: EU KLEMS Database, March 2007, http://www.euklems.net; and own calculations.

5.2 Shifts in the skill composition of hours worked

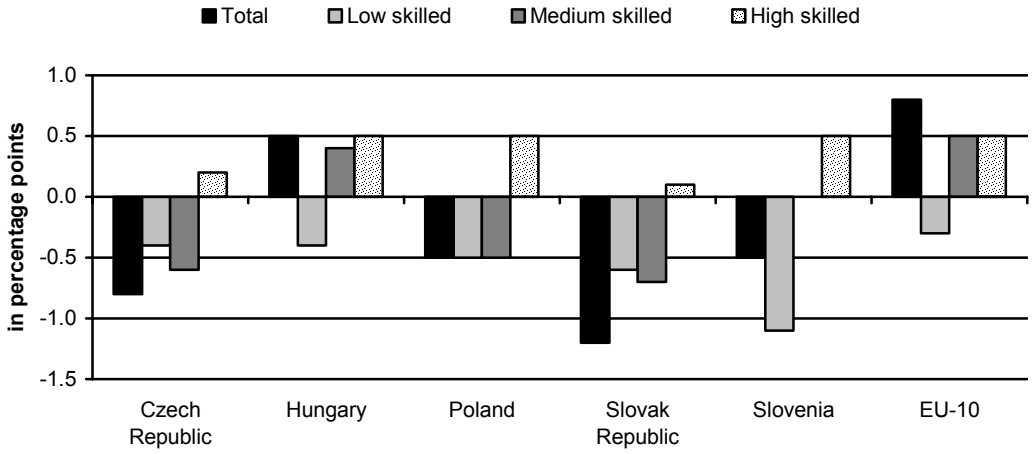
The restructuring of CEE economies was characterized not only by shifts in the sectoral composition of employment and hours worked, but also by large changes in the skill composition of labour. Figure 5.5 illustrates the contributions of individual educational attainment groups to overall developments in hours worked in the region. In all CEE countries a reduction of hours worked of low-skilled employed occurred, ranging from -0.4% p.a. in the Czech Republic to -1.1% p.a. in Slovenia, measured as average growth contributions. In the EU-10 the decline was much lower in the same period.

By contrast, hours worked by high-skilled employed persons rose in all countries, but the magnitude differed. In Hungary, Poland and Slovenia growth contributions were similar to the EU-10 (about 0.5%), whereas in the Czech and Slovak Republics only a moderate rise (0.17% and 0.14% respectively) was achieved in that group of employed persons. In the latter two countries (as well as in Poland) also the medium-educated workforce was hit by the reduction in labour demand. Since their share in total employment is the largest of all skill groups, their contribution to the decline in total hours worked outpaced even that of the

low-skilled workers. In Slovenia, hours worked of medium-skilled remained stable, whereas in Hungary the overall growth in labour demand had a positive impact on medium-skilled, experiencing an annual rise in hours worked by 0.4% in terms of growth contributions. Obvious reasons for that shift of relative demand towards higher educated persons are the skill-biased nature of technical change when converging towards Western technologies together with structural shifts towards more skill-intensive industries as illustrated in Section 3 above.

Figure 5.5

Contributions of skill groups to average annual growth of hours worked, 1995-2004



Source: EU KLEMS Database, March 2007, http://www.euklems.net; and own calculations.

5.3 Skill contribution to changes in labour services

Shifts in the skill structure obviously have an impact on the development of labour services. The growth accounting framework allows to distinguish between quantities of hours worked (as discussed above) and the so-called labour services, i.e. taking into account compositional changes. It is worth looking at the magnitude of these changes, particularly at the changes in labour composition with respect to educational attainment levels. We are going to present the results in terms of hours worked for the total economy as well as for selected industries.

5.3.1 Measuring and decomposing labour composition changes

The methodology to estimate labour services closely follows the method introduced by Jorgenson et al. (1987) – JGF 1987 thereafter – and is now commonly used in the literature. A more recent documentation and outline of this methodology can be found in Jorgenson et al. (2005), chapter 6. The method is based on the translog (or Tornqvist) form

of the heterogeneous components. Diewert (1976) has shown that this is exact for a translog function of labour input. The basic assumption is that productivity varies across various types of labour which is not taken account of when using aggregate hours worked or numbers employed as a measure of labour input. The various types of labour which are distinguished in the EU KLEMS database are by qualification (high, medium, low), gender (male, female) and age (15-29, 30-49, 50+) which in total gives 3 x 2 x 3 = 18 types of workers for every industry. The measure of labour input which takes into account these differences in productivity is called *labour services*. Following JGF 1987, it is assumed that aggregate labour services are a translog function of the services of the particular types of labour and that the flow of labour services is proportional to hours worked. Further it has to be assumed that workers of the particular type are paid according to their marginal product. The corresponding index of labour services (indexed by 1) is then a translog quantity index of individual types *s = 1,...,18* given by

$$\Delta \ln L_{it} = \sum_{s} \overline{v}_{sit} \Delta \ln H_{sit}$$

for each industry *i = 1,...,n* and year t. We do not include the country superscript in these expressions. H_{sit} denotes hours worked, and the corresponding weights are given by

$$\overline{v}_{sit} = \frac{(v_{sit} + v_{si,t-1})}{2}$$

where $v_{sit} = \left[\sum_{s} w_{sit} H_{sit} \right]^{-1} w_{sit} H_{sit}$

with w_{sit} denoting the price of labour of the respective qualification *s* in industry *i* and year *t*. The labour composition effect[18] can then be calculated from

$$\Delta LC_{it} = \Delta \ln L_{it} - \Delta \ln H_{it}$$

where $H_{it} = \sum_{s} H_{sit}$,

i.e. the difference between weighted and un-weighted growth rates of hours worked. Labour composition will grow whenever there is a shift in the share of total hours worked towards higher-paid workers and thus workers with higher marginal productivity, e.g. towards higher-skilled workers.

So far we have shown the labour composition index for a particular industry *i*. At a more aggregated level the corresponding variable has to be summed up for the respective

[18] In the literature this is also referred to as labour quality effect.

industries of the aggregate and the same method is applied as outlined above. Note that an index of aggregate labour input with the industry dimension as another characteristic of the individual workers is not appropriate for a well-defined aggregate production possibility frontier or an aggregate production function. This would have to include the importance of reallocation of workers among industries (see Jorgensen et al., 2005).

The methodological framework of growth accounting uses a number of assumptions and deserves some more elaboration. Let us summarize the most important issues. First, the concept is based on a framework of perfect competition (not only on product but also on factor markets). Although this assumption might partly be relaxed (e.g. by allowing for mark-ups) this would require even more detailed data which are in most cases not available. With respect to the modelling of the labour market, one first should notice that the whole concept arises from a production function framework, i.e. producer behaviour, with labour types as factors of production (usually measured as hours worked). The measure of labour input via hours worked cannot allow for the intensity of work (see e.g. Becker, 1985), which is not accounted for in the data. However, this is partly taken into account as far as intensity of work is reflected in labour compensation. A similar issue arises from discrimination of groups in the labour force (e.g. by gender or age). Again, conceptually this should not be a problem when assuming a perfectly competitive price-taking behaviour of the producers.

These caveats are the reason why the EU KLEMS methodology refers to ‘changes in labour composition’ rather than ‘labour quality’ as the latter has a normative connotation, which may be misleading (for instance, if wages differ because of gender discrimination, lower female wages would suggest that the ‘quality’ of labour is lower as compared to men). A second issue is that one has to assume that compensation reflects marginal product, which might not be true when wages reflect e.g. market power by trade unions. As long as market power is exercised on the supply side of the labour market, this is conceptually consistent with price-taking behaviour of producers. A related issue is signalling (see Arrow, 1973 and Spence, 1973 and 1974) which might violate the equality of compensation and marginal products. However, empirical studies based on longitudinal data for individuals show that years of schooling dominate the rank in the educational distribution which serves as a proxy for unobserved ability under the signalling hypothesis (see Kroch and Sjoblom, 1994). Thus, the potential methodological reservations might be acceptable from a theoretical point of view or some of them could, in principle, be dealt with in empirical studies through the use of more detailed data, which are however not yet available to us at the industrial level. Thus, despite potential problems with the chosen framework, we expect it to capture nonetheless essential features of labour markets and to be useful for productivity analysis.

A partial index of labour input incorporates only a subset of the characteristics of individual workers. To single out the contributions of skills, this can be calculated by summing up hours worked and the corresponding value shares over the other characteristics and then forming a Tornqvist index over qualifications, i.e.:

$$\Delta \ln L_{it}^{S} = \sum_{s} \bar{v}_{ist} \Delta \ln H_{ist}$$

where $\bar{v}_{ist} = 0.5\left(v_{ist} + v_{is,t-1}\right)$ and v_{ist} denotes the compensation share of skill type s. The contribution of skills to labour composition then is

$$\Delta \ln LC_{it}^{s} = \Delta \ln L_{it}^{s} - \Delta \ln H_{it}$$

We here ignore the terms with higher orders as these are negligible in other studies and cannot be calculated from the data provided in the EU KLEMS database. Moreover, in Table A.5.8 in the Appendix we present the percentage share of labour composition change due to skills in total labour composition change, i.e. $\Delta \ln LC_{it}^{s} / \Delta \ln LC_{it}$ in per cent.

5.3.2 Results at the economy-wide level

As illustrated in Table 2.4 above, the changes in labour composition have contributed positively to value added growth in all CEE countries. The absolute growth rates of labour composition range from 0.47% in the Czech Republic to an outstanding annual growth rate of 1.13% in Hungary (see Appendix Table A.5.6). Thus labour composition growth in all CEE countries was at least twice as high as in the EU-10. The change in the labour composition effect can be traced to various factors as described above. The most prominent ones, also incorporated in the EU KLEMS database, are educational attainment levels (also denoted as skills in this paper), gender and age. Moreover, when calculating the labour composition changes of the overall economy, sectoral shifts add to the total changes in labour composition as well. Here we concentrate on the most important factor, namely on changes in the skill composition, and illustrate their magnitudes as well as the contribution to overall labour composition change.

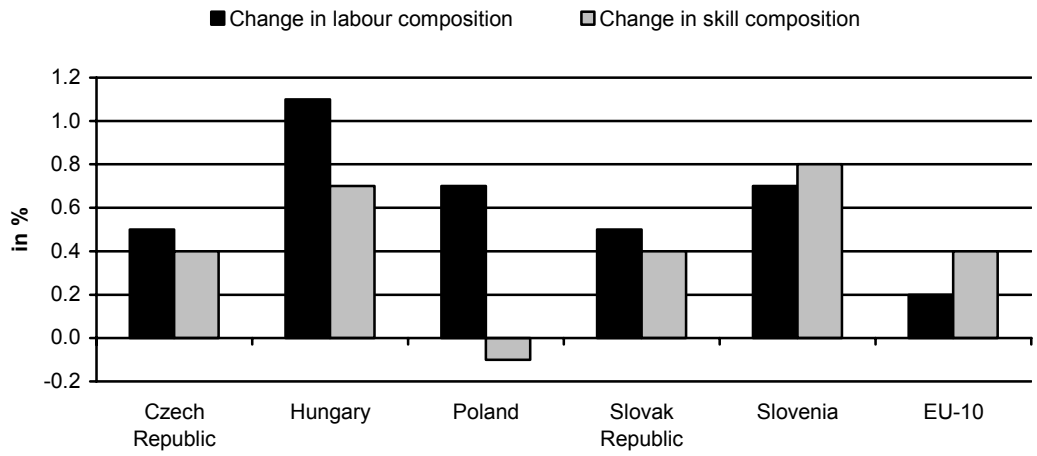
As shown in Figure 5.6, movements in the labour composition effected by shifts in the skill composition of the workforce were comparable to the EU-10 in the Czech and Slovak Republics (with an annual growth rate of about 0.4%). In Hungary and Slovenia it amounted to around 0.8%. Only in Poland it had a negative impact on the total labour composition effect. The reason for this might be that, although an upgrading of educational attainment took place within sectors, a shift from higher to lower skill-intensive sectors occurred

simultaneously.[19] However, in other CEE countries the share of the skills contribution in the total labour composition changes made up between 60% and 85%, except for Slovenia, where the composition effect due to skill changes was even higher than the total composition shift. The same is evident for the EU-10, where the rise of skill contributions was twice as high as the total labour composition growth. This indicates that, while a shift towards higher-educated employment occurred, an inclusion of other types of workers (see methodological explanations in Section 5.3.1) which are remunerated at lower rates took place. This may be due, for instance, to the rise of the female share in the workforce or of the share of younger workers, who are usually also compensated below average.

Figure 5.6

Labour composition growth and skill contributions, 1995-2004

(average annual growth rates)



Source: EU KLEMS Database, March 2007, http://www.euklems.net; and own calculations.

5.3.3 Results at the industry level

An investigation of labour composition changes at a detailed industry level reveals the importance of shifts in the services sectors in the majority of CEE countries. In Figure 5.7 we show the results for average annual growth of labour composition and skill contributions to the composition change for selected industries, while the detailed results on industry-level growth rates can be found in the Appendix.[20] Business services and Finance (NACE J-K) were the industries with the highest growth rates in skill-driven labour composition changes in general, although the growth patterns vary from country to country.

[19] Another reason might be that the unusual results for Poland are due to data errors to be corrected in the next version of the EU KLEMS database.

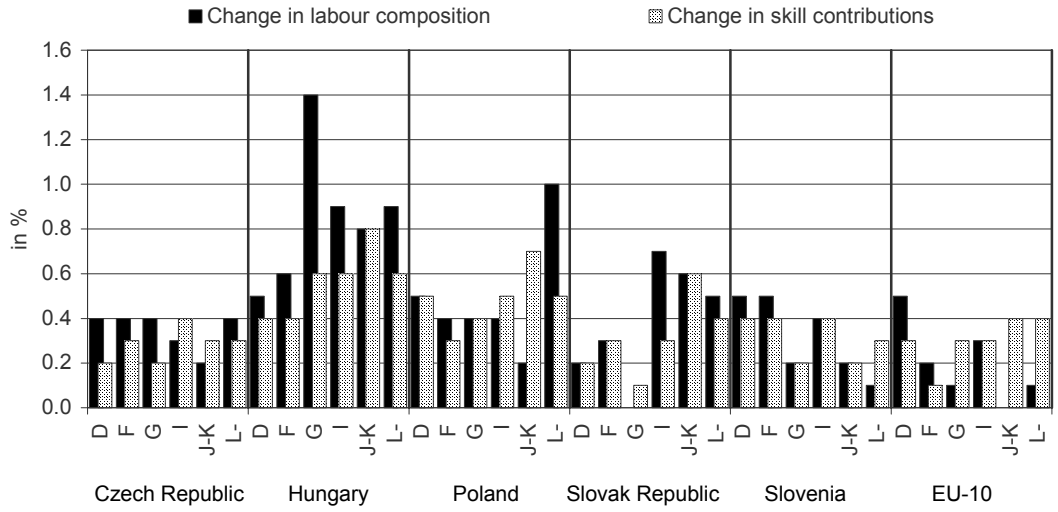
[20] Detailed results on growth rates in labour services, labour composition and skill contributions in labour composition, as well as the share of the skill contributions in labour composition changes at the NACE 1-digit level can be found in Tables A.5.6 to A.5.8.

In Hungary, high growth rates in labour composition were experienced not only in the high-skill market services sectors and public services, but even more so in Wholesale and retail trade (NACE G) and the Transport sector (NACE I). Moreover, the rise in the skill contributions to composition in these sectors was as high as in public services (NACE L-P), although the share in total composition change amounted to only 40% (NACE G) and 69% (NACE I) respectively – see Table 5.8. In Manufacturing (NACE D) and Construction (NACE F), annual labour composition growth rates, at about 0.5%, were substantially lower than in the overall economy, but in both sectors the skill change contributed to about 70% of the total composition change.

Figure 5.7

Labour composition changes and skill contributions in selected sectors, 1995-2004

(average annual growth rates)



Source: EU KLEMS Database, March 2007, http://www.euklems.net; and own calculations.

In Poland, the growth patterns of skill contributions were quite similar, with the highest rises in the high-skill market services (NACE J-K) and public service sectors, although here the absolute growth rates of labour composition were much lower, except for public services. However, Poland experienced comparatively high growth (0.5% p.a.) in labour composition in Manufacturing, which was driven by stronger skill changes than in any other CEE country.

Also in the Slovak Republic the highest growth rates of skill contributions can be found in the sectors Business services and Finance, followed by public services and the Transport sector, while Manufacturing, Construction as well as Wholesale and retail trade performed rather sluggishly.

In the Czech Republic, where labour composition growth has been the lowest in the CEE region, the rise in skill contributions was quite similar across all industries, with high-skill

market services, Transport and public services rising somewhat faster than other industries.

In Slovenia – the only CEE country where skill contributions to composition change exceeded total growth in labour composition – growth patterns were quite different. Here, skill contributions to labour composition in Manufacturing, Construction and Transport rose by about 0.4% p.a., about twice as much as Business services and Finance. Similarly, also skill contributions in public services grew by only 0.3% p.a.

6 Summary conclusions

This paper has analysed the growth and productivity performance of five Central and East European countries (the Czech Republic, Hungary, Poland, Slovakia and Slovenia) in the period 1995 to 2004. Using the recently available detailed EU KLEMS database, a wider comparison with a group of West European core economies illustrates the extraordinary speed of the CEE countries' restructuring and catching-up processes in the period before EU accession. After overcoming the severe transformational recession of the early 1990s, the CEE economies experienced a period of high GDP growth accompanied by even faster productivity growth and a resulting fall in employment. Given the relatively high labour productivity growth rates – which also reflect the catching-up process, as the starting level of GDP per capita was much lower in the CEE countries – overall growth was not sufficient to increase employment. There was, however, a strong skill bias in the structure of labour demand as growth rates for the highly educated workers were positive in all five countries, and in some cases (particularly in the period 2000-2004) even higher than value added growth. Compared to the West European core economies, multifactor productivity growth was also higher in most of the CEE economies. Generally, these patterns of growth rates imply a shift towards more high-tech and skill-intensive industries in both manufacturing and services sectors.

The various indicators of structural change show that Hungary, Poland and Slovakia experienced relatively more structural change in the period 1995-2004. However, despite the largely unspectacular speed of overall structural change and the close similarity of overall GDP structures, one can still observe marked differences at a more detailed level. Poland's structural change was mainly shaped by rapidly growing services sectors while the primary sector was diminishing and manufacturing industries were not affecting the overall structural change too much. A similar pattern of structural change occurred in Slovakia (and less so in Slovenia) whereas in the Czech Republic and Hungary manufacturing industries (in particular Motor vehicles) played a much more prominent role. In all five CEE countries, manufacturing industries together with distribution services were the most important sectors in terms of value added growth and contribution to (labour) productivity growth. The other sectors played a much less important role. On the other

hand, the manufacturing sector contributed only very modestly, and in some cases even negatively, to employment growth. However, the structural changes in manufacturing show the successful restructuring process going on in the transition economies: most of these countries have now reached or even surpassed the shares of the EU-10 in the higher-tech industries. Not only labour productivity growth but also multifactor productivity growth was higher in these countries than in the West European core economies. This again reflects a strong catching-up process and points to a strengthening of the CEE countries' position in the European patterns of broader specialization in the manufacturing industry. These dynamics resulted in the CEE countries' specialization in the higher-tech sectors, notably in transport equipment in the Czech Republic, Hungary and Slovakia, as well as in electrical and optical equipment in Hungary and Slovakia. The change in structures has been less dramatic in Slovenia, which has undergone a more balanced path of restructuring.

The analysis of changing patterns of employment and hours worked by sectors and skills in Section 5 showed that – while labour demand generally decreased in the primary and secondary sectors in all five countries (except for Manufacturing and Construction in Hungary) – the Business service sector (including Renting and Real estate services) served as the main engine of employment growth in the region. Hours worked of high-skilled employed rose in all countries, whereas the group of low- and medium-skilled had to face reductions. Only Hungary recorded a rise for the medium-skilled workforce as well. Finally, we looked at the development of labour composition. Its rise, ranging between 0.5% p.a. in the Czech Republic and 1.1% in Hungary, was at least twice as high as in the EU-10. It was to a large extent driven by the change in the skill composition of the workforce. The change in skill contributions amounted to between 60% of the total labour composition growth in Hungary and 108% in Slovenia, where it even outpaced the total labour composition growth. The latter happened also in the EU-10, most likely due to a rise in the share of women in the workforce being compensated below average. An investigation of labour composition changes at the detailed industry level revealed that in the CEE region as a whole, Business services and Finance showed the highest growth rates in skill contributions to labour compensation, followed by Transport and Public services.

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Appendix

Table A.3.1a

Shares of gross output in total manufacturing

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU10	
	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004
Agriculture, hunting, forestry and fishing	4.3	2.7	7.9	4.4	8.8	5.0	6.0	3.7	4.1	2.6	2.0	1.6
Mining and quarrying	1.7	1.0	0.5	0.2	3.0	1.8	0.8	0.4	0.7	0.4	0.8	0.5
Manufacturing	35.7	39.6	35.2	38.9	32.2	32.6	37.5	38.5	37.8	36.8	31.0	30.2
Electricity, gas and water supply	6.2	4.7	3.9	3.9	3.9	3.8	6.7	7.9	3.0	2.7	2.7	2.5
Construction	9.7	8.7	5.3	5.4	7.5	6.7	7.0	6.9	7.9	9.4	8.1	7.3
Wholesale and retail trade	9.1	9.1	10.6	9.5	15.4	15.3	11.5	10.5	10.7	9.7	9.0	8.7
Hotels and restaurants	2.1	1.7	2.0	1.7	0.9	1.0	1.4	1.0	2.2	2.0	2.2	2.2
Transport, storage and communication	8.1	8.7	6.8	6.3	6.1	7.6	8.0	9.9	6.4	7.8	7.0	8.0
Financial intermediation	2.6	2.8	3.1	2.9	1.8	3.1	2.9	3.1	3.4	3.2	5.0	5.7
Real estate, renting and business activities	10.1	10.6	10.1	12.0	7.8	10.9	8.2	8.6	10.2	11.4	14.9	16.0
Community, social and personal services	10.2	10.5	14.6	14.7	12.4	12.3	10.0	9.4	13.4	13.8	17.3	17.3

Table A.3.1b

Shares of value added in total manufacturing

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU10	
	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004
Agriculture, hunting, forestry and fishing	5.0	3.3	6.8	3.9	8.0	5.1	5.9	4.5	4.2	2.7	2.0	1.7
Mining and quarrying	2.2	1.4	0.4	0.2	3.7	2.5	1.0	0.6	1.0	0.6	0.9	0.6
Manufacturing	24.3	25.6	22.3	22.5	21.1	19.2	26.8	23.6	26.4	25.7	20.0	18.8
Electricity, gas and water supply	5.3	3.8	3.3	3.1	3.6	3.7	4.8	4.8	2.5	3.0	2.5	2.1
Construction	6.6	6.5	5.2	5.0	6.7	5.5	5.1	6.3	5.4	5.7	6.5	6.1
Wholesale and retail trade	11.1	12.2	11.0	10.8	18.5	18.8	12.4	13.7	12.1	11.5	10.1	9.6
Hotels and restaurants	2.8	2.3	2.1	1.8	0.9	1.2	1.6	1.4	2.3	2.2	2.1	2.3
Transport, storage and communication	10.4	10.8	8.0	8.1	6.3	7.4	10.5	10.0	6.8	7.6	7.1	7.4
Financial intermediation	3.2	3.5	3.8	3.4	2.6	4.0	5.7	5.0	5.8	4.6	5.4	5.9
Real estate, renting and business activities	13.6	13.1	14.8	17.3	10.0	13.4	11.8	14.4	13.7	15.9	20.0	21.8
Community, social and personal services	15.5	17.5	22.3	23.9	18.6	19.2	14.3	15.7	19.7	20.5	23.5	23.8

Table A.3.1c

Shares of hours worked in total manufacturing

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU10	
	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004
Agriculture, hunting, forestry and fishing	7.2	4.4	8.4	5.7	31.4	33.1	9.7	4.6	18.4	12.4	5.8	4.4
Mining and quarrying	1.8	0.9	0.9	0.4	2.1	1.2	0.9	0.5	0.9	0.5	0.3	0.2
Manufacturing	26.5	26.8	23.4	22.8	19.3	16.2	25.2	24.8	29.4	26.9	19.6	16.7
Electricity, gas and water supply	1.6	1.3	2.6	1.6	1.6	1.4	1.9	1.9	1.4	1.3	0.8	0.6
Construction	10.6	9.6	6.3	8.4	5.4	4.1	7.2	7.7	6.3	7.8	7.9	8.0
Wholesale and retail trade	15.0	15.1	13.4	14.5	13.6	14.0	12.0	16.8	12.2	12.1	15.6	15.4
Hotels and restaurants	3.4	4.1	3.4	3.9	1.3	1.3	2.5	2.7	3.1	3.3	4.5	5.0
Transport, storage and communication	7.2	7.6	9.3	7.9	5.0	4.6	7.6	6.9	5.7	6.2	6.3	6.3
Financial intermediation	1.5	1.7	2.2	2.1	1.5	1.6	1.3	1.7	1.7	2.2	3.2	3.0
Real estate, renting and business activities	7.6	9.6	3.8	7.0	3.5	6.1	6.0	8.6	6.3	8.4	9.9	13.3
Community, social and personal services	17.6	18.9	26.2	25.8	15.3	16.3	25.7	23.9	14.7	19.0	26.1	27.1

Source: EU KLEMS database; own calculations.

Table A.3.2

Value added shares (nominal)

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU-10	
	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004
Agriculture	4.1	2.6	6.5	3.7	7.4	4.7	4.5	3.7	4.0	2.5	1.8	1.5
Forestry	0.8	0.6	0.3	0.2	0.5	0.4	1.4	0.8	0.2	0.2	0.2	0.1
Fishing	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Mining and quarrying	2.2	1.4	0.4	0.2	3.7	2.5	1.0	0.6	1.0	0.6	0.9	0.6
Food and beverages	3.3	3.1	4.0	2.7	3.6	3.1	3.3	1.7	2.8	2.3	2.0	1.9
Tobacco	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1
Textiles	0.9	0.6	0.7	0.3	0.8	0.5	0.6	0.4	1.2	0.9	0.7	0.5
Wearing Apparel, Dressing And Dying Of Fur	0.8	0.3	0.9	0.5	1.1	0.5	0.9	0.6	1.4	0.6	0.5	0.3
Leather, leather and footwear	0.3	0.1	0.4	0.1	0.4	0.2	0.4	0.4	0.7	0.4	0.3	0.2
Wood, wood products and cork	0.9	0.9	0.6	0.4	0.7	0.8	0.9	1.1	1.0	0.8	0.4	0.4
Pulp, paper and paper	0.7	0.6	0.4	0.3	0.6	0.5	1.2	0.7	0.7	0.7	0.5	0.5
Printing, publishing and reproduction	0.6	0.9	0.9	0.8	1.1	1.0	1.0	0.8	1.6	1.1	1.1	1.0
Coke, refined petroleum and nuclear fuel	0.8	0.2	1.8	1.3	0.6	0.6	2.2	1.5	0.1	0.0	0.2	0.2
Chemicals and chemical	1.7	1.4	2.6	2.2	1.8	1.4	3.6	0.9	2.7	3.5	2.1	1.9
Rubber and plastics	0.5	1.5	0.8	1.0	1.0	1.2	1.1	1.2	1.4	1.6	1.0	1.0
Other non-metallic mineral	1.7	2.0	1.1	0.9	1.2	1.4	1.3	1.3	1.3	1.2	1.0	0.8
Basic metals	2.6	1.5	0.8	0.8	1.3	0.4	2.3	2.8	0.9	1.0	1.0	0.8
Fabricated metal	2.3	2.7	1.6	1.3	1.3	1.7	1.7	2.4	2.7	3.1	1.9	2.0
Machinery, n.e.c.	2.7	2.5	1.6	1.4	1.8	1.5	2.4	1.9	2.1	2.6	2.3	2.3
Office, accounting and computing machinery	0.1	0.1	0.0	0.6	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1
Electrical machinery and apparatus, nec	1.0	1.8	0.9	2.4	0.7	0.9	0.7	1.4	1.5	1.5	0.9	0.9
Radio, television and communication equipment	0.2	0.6	0.5	1.9	0.4	0.3	0.3	0.4	0.6	0.7	0.5	0.5
Medical, precision and optical instruments	0.4	0.6	0.7	0.5	0.3	0.4	0.4	0.3	0.7	0.8	0.5	0.6
Motor vehicles, trailers and semi-trailers	0.9	2.7	1.1	2.3	0.7	1.1	0.6	2.1	0.9	1.0	1.4	1.5
Other transport equipment	0.4	0.3	0.1	0.2	0.6	0.5	0.5	0.3	0.2	0.2	0.4	0.5
Manufacture, n.e.c, Recycling	1.2	1.0	0.6	0.4	1.1	1.2	0.8	0.9	1.6	1.4	0.9	0.9
Electricity, gas and water supply	5.3	3.8	3.3	3.1	3.6	3.7	4.8	4.8	2.5	3.0	2.5	2.1
Construction	6.6	6.5	5.2	5.0	6.7	5.5	5.1	6.3	5.4	5.7	6.5	6.1
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	2.1	1.7	1.2	1.6	3.3	3.3	0.7	1.1	2.5	1.9	1.7	1.7
Wholesale trade and commission trade, except of motor vehicles and motorcycles	5.5	6.3	4.2	4.7	6.2	7.6	6.4	6.5	4.8	5.4	4.0	3.7
Retail trade, except of motor vehicles and motorcycles; repair of household goods	3.5	4.2	5.7	4.5	9.0	7.9	5.4	6.1	4.7	4.3	4.4	4.2
Hotels and restaurants	2.8	2.3	2.1	1.8	0.9	1.2	1.6	1.4	2.3	2.2	2.1	2.3
Inland transport	4.6	4.6	4.0	3.1	3.1	3.4	6.0	5.9	2.9	2.9	2.5	2.5
Water transport	0.1	0.0	0.1	0.0	0.2	0.0	0.0	0.1	0.3	0.2	0.2	0.3
Air transport	0.3	0.3	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.2	0.4	0.4
Supporting and auxiliary transport activities; activities of travel agencies	3.3	2.9	1.1	1.3	1.2	1.0	2.2	1.2	1.6	1.7	1.4	1.8
Post and telecommunications	2.2	3.1	2.8	3.5	1.7	2.9	2.2	2.9	2.0	2.5	2.5	2.5
Financial intermediation, except insurance and pension funding	2.7	2.5	3.2	2.0	1.8	3.1	4.5	3.3	4.4	3.5	3.8	4.1
Insurance and pension funding, except compulsory social security	0.5	0.5	0.3	0.6	0.4	0.5	1.1	1.5	0.9	0.9	1.0	1.0
Activities related to financial intermediation	0.0	0.6	0.2	0.7	0.3	0.4	0.1	0.2	0.5	0.2	0.6	0.8
Real estate activities	7.2	5.2	7.3	8.0	6.1	6.5	8.2	8.2	7.8	7.4	11.2	10.9
Renting of machinery and equipment	0.2	0.3	0.7	0.5	0.1	0.3	0.8	0.4	0.1	0.1	0.9	1.3
Computer and related activities	0.6	1.3	0.5	1.4	0.3	0.9	0.7	0.9	0.4	1.2	1.2	1.8
Research and development	0.3	0.3	0.5	0.5	0.6	0.4	1.0	0.3	0.5	0.5	0.4	0.4
Other business activities	5.2	6.0	5.8	6.9	2.9	5.3	1.2	4.6	5.0	6.8	6.3	7.4
Public administration and defence; compulsory social security	5.4	5.7	8.4	9.4	6.8	6.1	5.2	5.8	5.9	6.3	7.3	6.9
Education	4.1	4.3	5.3	5.8	4.5	5.1	3.5	3.9	5.4	5.8	6.2	6.6
Health and social work	3.5	4.1	4.7	5.2	3.3	3.6	3.4	3.6	5.2	5.0	6.3	6.2
Sewage and refuse disposal, sanitation and similar activities	0.6	0.7	0.4	0.5	0.2	0.5	0.5	0.5	0.2	0.3	0.6	0.7
Activities of membership organizations nec	0.2	0.3	0.5	0.4	1.1	1.4	0.2	0.3	0.8	0.5	0.5	0.5
Recreational, cultural and sporting activities	1.1	1.7	1.9	1.8	0.8	1.2	1.2	1.2	1.7	2.2	1.5	1.7
Other service activities	0.6	0.6	1.1	0.8	1.3	0.6	0.2	0.4	0.5	0.4	0.7	0.7
Private households with employed persons	0.0	0.0			0.7	0.6			0.0	0.0	0.4	0.5

Table A.3.3

Shares in hours worked

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU-10	
	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004
Agriculture	6.1	3.5	7.9	5.2	30.8	32.7	8.4	3.7	18.1	12.1	5.4	4.1
Forestry	1.1	0.8	0.5	0.4	0.5	0.4	1.4	0.9	0.3	0.3	0.2	0.1
Fishing	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.1
Mining and quarrying	1.8	0.9	0.9	0.4	2.1	1.2	0.9	0.5	0.9	0.5	0.3	0.2
Food and beverages	3.0	2.9	4.2	3.6	3.4	3.0	2.8	2.6	2.1	2.4	2.4	2.2
Tobacco	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0
Textiles	1.8	1.1	1.2	0.7	1.1	0.6	1.2	0.9	1.9	1.4	0.8	0.5
Wearing Apparel, Dressing And Dying Of Fur	1.2	1.0	2.2	1.7	1.9	1.2	1.6	1.8	2.3	1.4	0.8	0.5
Leather, leather and footwear	0.6	0.2	0.8	0.4	0.6	0.3	0.9	0.8	1.2	0.7	0.3	0.2
Wood, wood products and cork	1.4	1.7	0.9	1.0	0.9	0.9	1.3	1.6	1.6	1.4	0.7	0.5
Pulp, paper and paper	0.5	0.4	0.2	0.3	0.3	0.3	0.7	0.4	0.8	0.6	0.5	0.4
Printing, publishing and reproduction	0.7	0.9	1.0	0.8	0.5	0.7	0.8	0.8	1.2	1.1	1.2	1.0
Coke, refined petroleum and nuclear fuel	0.2	0.1	0.2	0.1	0.2	0.1	0.3	0.2	0.1	0.0	0.1	0.1
Chemicals and chemical	0.8	0.8	1.7	1.2	0.9	0.6	1.2	0.6	1.4	1.5	1.1	0.9
Rubber and plastics	0.8	1.4	0.8	1.0	0.7	0.9	0.8	1.0	1.4	1.5	0.9	0.8
Other non-metallic mineral	1.6	1.6	0.9	0.8	1.1	0.9	1.4	1.3	1.3	1.1	0.9	0.8
Basic metals	2.0	1.2	0.8	0.9	1.0	0.4	1.4	1.3	1.1	0.9	0.7	0.5
Fabricated metal	2.8	3.4	1.7	1.8	1.2	1.5	2.3	2.8	3.2	3.7	2.1	1.9
Machinery, n.e.c.	3.4	2.9	2.3	1.6	1.8	1.2	3.6	2.4	3.3	2.9	2.1	1.8
Office, accounting and computing machinery	0.1	0.2	0.1	0.2	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1
Electrical machinery and apparatus, nec	1.4	2.1	1.2	1.6	0.6	0.6	1.3	2.4	1.6	1.6	1.0	0.8
Radio, television and communication equipment	0.4	0.7	0.6	1.9	0.3	0.2	0.5	0.5	0.7	0.7	0.5	0.4
Medical, precision and optical instruments	0.6	0.7	0.6	0.5	0.3	0.3	0.6	0.5	0.7	0.9	0.6	0.5
Motor vehicles, trailers and semi-trailers	1.0	1.8	0.6	1.2	0.6	0.6	0.6	1.1	0.9	0.8	1.1	1.1
Other transport equipment	0.7	0.4	0.3	0.2	0.7	0.5	0.6	0.4	0.4	0.3	0.5	0.4
Manufacture, n.e.c, Recycling	1.4	1.6	1.0	1.2	1.2	1.4	1.2	1.2	2.0	1.9	1.2	1.0
Electricity, gas and water supply	1.6	1.3	2.6	1.6	1.6	1.4	1.9	1.9	1.4	1.3	0.8	0.6
Construction	10.6	9.6	6.3	8.4	5.4	4.1	7.2	7.7	6.3	7.8	7.9	8.0
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	1.4	2.1	1.2	2.3	1.2	1.6	0.8	1.3	1.6	1.8	2.4	2.4
Wholesale trade and commission trade, except of motor vehicles and motorcycles	5.0	4.9	1.8	2.3	4.6	4.5	5.3	6.9	5.0	4.7	4.8	4.7
Retail trade, except of motor vehicles and motorcycles; repair of household goods	8.6	8.1	10.3	9.9	7.9	7.9	5.9	8.6	5.6	5.5	8.4	8.2
Hotels and restaurants	3.4	4.1	3.4	3.9	1.3	1.3	2.5	2.7	3.1	3.3	4.5	5.0
Inland transport	4.7	5.0	6.4	5.3	3.3	2.9	5.2	4.6	3.6	3.7	3.1	2.9
Water transport	0.1	0.0	0.2	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1
Air transport	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2
Supporting and auxiliary transport activities; activities of travel agencies	0.7	1.1	0.4	0.7	0.5	0.6	0.7	0.9	1.0	1.0	1.3	1.7
Post and telecommunications	1.6	1.4	2.2	1.7	1.1	1.0	1.6	1.4	0.9	1.3	1.5	1.3
Financial intermediation, except insurance and pension funding	1.1	0.9	1.5	1.4	1.0	1.1	1.1	1.2	1.0	1.4	1.9	1.8
Insurance and pension funding, except compulsory social security	0.3	0.3	0.6	0.6	0.4	0.2	0.2	0.4	0.3	0.6	0.6	0.5
Activities related to financial intermediation	0.1	0.5	0.1	0.1	0.1	0.3	0.0	0.1	0.3	0.2	0.7	0.7
Real estate activities	0.9	1.1	0.5	0.4	1.0	1.2	0.9	0.8	0.1	0.4	0.9	1.0
Renting of machinery and equipment	0.2	0.2	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.3	0.3
Computer and related activities	0.7	1.0	0.4	0.9	0.2	0.4	0.6	0.9	0.3	0.9	1.0	1.7
Research and development	0.3	0.3	0.3	0.3	0.4	0.4	1.0	0.6	0.3	0.4	0.4	0.4
Other business activities	5.5	6.9	2.6	5.2	1.9	4.1	3.3	6.1	5.4	6.6	7.4	9.9
Public administration and defence; compulsory social security	5.5	6.0	7.1	7.6	3.9	5.2	6.2	6.4	3.5	5.4	7.3	6.5
Education	4.1	4.3	7.7	7.2	3.6	4.4	8.9	7.9	4.3	5.5	5.0	5.4
Health and social work	5.1	5.1	6.2	6.8	5.6	4.2	6.5	6.1	4.4	5.2	8.0	8.6
Sewage and refuse disposal, sanitation and similar activities	0.5	0.6	0.6	0.5	0.3	0.4	1.0	0.8	0.2	0.3	0.6	0.7
Activities of membership organizations nec	0.3	0.5	0.3	0.3	0.5	0.5	0.3	0.6	0.5	0.3	0.7	0.7
Recreational, cultural and sporting activities	1.3	1.4	1.9	2.0	0.9	1.0	2.0	1.4	1.0	1.4	1.7	2.0
Other service activities	0.8	1.0	2.2	1.4	0.4	0.6	0.7	0.8	0.8	0.8	1.3	1.4
Private households with employed persons	0.0	0.0	0.0	0.0	0.1	0.1			0.1	0.0	1.5	1.8

Table A.3.5

Change in value added shares 1995-2004 and difference to EU-10 in 1994

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU-10	
	95-04	Diff. 95	95-04	Diff. 95	95-04	Diff. 95	95-04	Diff. 95	95-04	Diff. 95	95-04	Diff. 95
Agriculture	-1.5	2.3	-2.8	4.7	-2.7	5.6	-0.8	2.7	-1.5	2.2	-0.3	0.0
Forestry	-0.2	0.6	-0.1	0.1	-0.1	0.3	-0.6	1.2	0.0	0.0	-0.1	0.0
Fishing	-0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.0
Mining and quarrying	-0.8	1.3	-0.2	-0.5	-1.2	2.8	-0.4	0.1	-0.4	0.1	-0.3	0.0
Food and beverages	-0.2	1.3	-1.3	2.0	-0.5	1.6	-1.6	1.3	-0.5	0.8	-0.1	0.0
Tobacco	0.0	0.1	0.0	0.0	0.0	0.0	-0.1	0.1	-0.1	0.1	0.0	0.0
Textiles	-0.3	0.2	-0.4	0.0	-0.3	0.1	-0.2	-0.1	-0.3	0.5	-0.2	0.0
Wearing Apparel, Dressing And Dying Of Fur	-0.5	0.3	-0.4	0.4	-0.6	0.6	-0.3	0.4	-0.8	0.9	-0.2	0.0
Leather, leather and footwear	-0.2	0.0	-0.3	0.1	-0.2	0.1	0.0	0.1	-0.3	0.4	-0.1	0.0
Wood, wood products and cork	0.0	0.5	-0.2	0.2	0.1	0.3	0.2	0.5	-0.2	0.6	0.0	0.0
Pulp, paper and paper	-0.1	0.2	-0.1	-0.1	-0.1	0.1	-0.5	0.7	0.0	0.2	0.0	0.0
Printing, publishing and reproduction	0.3	-0.5	-0.1	-0.2	-0.1	0.0	-0.2	-0.1	-0.5	0.5	-0.1	0.0
Coke, refined petroleum and nuclear fuel	-0.6	0.6	-0.5	1.6	0.0	0.4	-0.7	2.0	-0.1	-0.1	0.0	0.0
Chemicals and chemical	-0.3	-0.4	-0.4	0.5	-0.4	-0.3	-2.7	1.5	0.8	0.6	-0.2	0.0
Rubber and plastics	1.0	-0.5	0.2	-0.2	0.2	0.0	0.1	0.1	0.2	0.4	0.0	0.0
Other non-metallic mineral	0.3	0.7	-0.2	0.1	0.2	0.2	0.0	0.3	-0.1	0.3	-0.2	0.0
Basic metals	-1.1	1.6	0.0	-0.2	-0.9	0.3	0.5	1.3	0.1	-0.1	-0.2	0.0
Fabricated metal	0.4	0.4	-0.3	-0.3	0.4	-0.6	0.7	-0.2	0.4	0.8	0.1	0.0
Machinery, n.e.c.	-0.2	0.4	-0.2	-0.7	-0.3	-0.5	-0.5	0.1	0.5	-0.2	0.0	0.0
Office, accounting and computing machinery	0.0	-0.1	0.6	-0.2	0.0	-0.1	0.1	-0.1	0.0	-0.1	-0.1	0.0
Electrical machinery and apparatus, nec	0.8	0.1	1.5	0.0	0.2	-0.2	0.7	-0.2	0.0	0.6	0.0	0.0
Radio, television and communication equipment	0.4	-0.3	1.4	0.0	-0.1	-0.1	0.1	-0.2	0.1	0.1	0.0	0.0
Medical, precision and optical instruments	0.2	-0.1	-0.2	0.2	0.1	-0.2	-0.1	-0.1	0.1	0.2	0.1	0.0
Motor vehicles, trailers and semi-trailers	1.8	-0.5	1.2	-0.3	0.4	-0.7	1.5	-0.8	0.1	-0.5	0.1	0.0
Other transport equipment	-0.1	0.0	0.1	-0.3	-0.1	0.2	-0.2	0.1	0.0	-0.2	0.1	0.0
Manufacture, n.e.c, Recycling	-0.2	0.3	-0.2	-0.3	0.1	0.2	0.1	-0.1	-0.2	0.7	0.0	0.0
Electricity, gas and water supply	-1.5	2.8	-0.2	0.8	0.1	1.1	0.0	2.3	0.5	0.0	-0.4	0.0
Construction	-0.1	0.1	-0.2	-1.3	-1.2	0.2	1.2	-1.4	0.3	-1.1	-0.4	0.0
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	-0.4	0.4	0.4	-0.5	0.0	1.6	0.4	-1.0	-0.6	0.8	0.0	0.0
Wholesale trade and commission trade, except of motor vehicles and motorcycles	0.8	1.5	0.5	0.2	1.4	2.2	0.1	2.4	0.6	0.8	-0.3	0.0
Retail trade, except of motor vehicles and motorcycles; repair of household goods	0.7	-0.9	-1.2	1.3	-1.1	4.6	0.7	1.0	-0.4	0.3	-0.2	0.0
Hotels and restaurants	-0.5	0.7	-0.3	0.0	0.3	-1.2	-0.2	-0.5	-0.1	0.2	0.2	0.0
Inland transport	0.0	2.1	-0.9	1.5	0.3	0.6	-0.1	3.5	0.0	0.4	0.0	0.0
Water transport	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	0.1	-0.2	-0.1	0.1	0.1	0.0
Air transport	0.0	-0.1	0.0	-0.3	0.0	-0.3	0.0	-0.4	0.1	-0.3	0.0	0.0
Supporting and auxiliary transport activities; activities of travel agencies	-0.4	1.9	0.2	-0.3	-0.2	-0.2	-1.0	0.8	0.1	0.2	0.4	0.0
Post and telecommunications	0.9	-0.3	0.7	0.3	1.2	-0.8	0.7	-0.3	0.5	-0.5	0.0	0.0
Financial intermediation, except insurance and pension funding	-0.2	-1.1	-1.2	-0.6	1.3	-2.0	-1.2	0.7	-0.9	0.6	0.3	0.0
Insurance and pension funding, except compulsory social security	0.0	-0.5	0.3	-0.7	0.1	-0.6	0.4	0.1	0.0	-0.1	0.0	0.0
Activities related to financial intermediation	0.6	-0.6	0.5	-0.4	0.1	-0.3	0.1	-0.5	-0.3	-0.1	0.2	0.0
Real estate activities	-2.0	-4.0	0.7	-3.9	0.4	-5.1	0.0	-3.0	-0.4	-3.4	-0.3	0.0
Renting of machinery and equipment	0.1	-0.7	-0.2	-0.2	0.2	-0.8	-0.4	-0.1	0.0	-0.8	0.4	0.0
Computer and related activities	0.7	-0.6	0.9	-0.7	0.6	-0.9	0.2	-0.5	0.8	-0.8	0.6	0.0
Research and development	0.0	-0.1	0.0	0.1	-0.2	0.2	-0.7	0.6	0.0	0.1	0.0	0.0
Other business activities	0.8	-1.1	1.1	-0.5	2.4	-3.4	3.4	-5.1	1.8	-1.3	1.1	0.0
Public administration and defence; compulsory social security	0.3	-1.9	1.0	1.1	-0.7	-0.5	0.6	-2.1	0.4	-1.4	-0.4	0.0
Education	0.2	-2.1	0.5	-0.9	0.6	-1.7	0.4	-2.7	0.4	-0.8	0.4	0.0
Health and social work	0.6	-2.8	0.5	-1.6	0.3	-3.0	0.2	-2.9	-0.2	-1.1	-0.1	0.0
Sewage and refuse disposal, sanitation and similar activities	0.1	0.0	0.1	-0.2	0.3	-0.4	0.0	-0.1	0.1	-0.4	0.1	0.0
Activities of membership organizations nec	0.1	-0.3	-0.1	0.0	0.3	0.6	0.1	-0.3	-0.3	0.3	0.0	0.0
Recreational, cultural and sporting activities	0.6	-0.4	-0.1	0.4	0.4	-0.7	0.0	-0.3	0.5	0.2	0.2	0.0
Other service activities	0.0	-0.1	-0.3	0.4	-0.7	0.6	0.2	-0.5	-0.1	-0.2	0.0	0.0
Private households with employed persons	0.0	-0.4	0.0	-0.4	-0.1	0.3	0.0	-0.4	0.0	-0.4	0.1	0.0

Table A.3.5

Change in shares of hours worked 1995-2004 and difference to EU-10 in 1994

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU-10	
	95-04	Diff. 95	95-04	Diff. 95	95-04	Diff. 95	95-04	Diff. 95	95-04	Diff. 95	95-04	Diff. 95
Agriculture	-2.6	0.7	-2.7	2.5	1.9	25.4	-4.7	3.0	-6.0	12.7	-1.3	0.0
Forestry	-0.3	0.9	-0.1	0.3	-0.1	0.3	-0.5	1.2	0.0	0.1	-0.1	0.0
Fishing	-0.1	-0.1	0.0	-0.2	-0.1	-0.1	0.0	-0.2	0.1	-0.2	-0.1	0.0
Mining and quarrying	-0.9	1.5	-0.5	0.6	-0.9	1.8	-0.4	0.6	-0.4	0.6	-0.1	0.0
Food and beverages	-0.1	0.6	-0.6	1.8	-0.4	1.0	-0.2	0.4	0.3	-0.3	-0.2	0.0
Tobacco	0.1	-0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0
Textiles	-0.7	1.0	-0.5	0.4	-0.5	0.3	-0.3	0.4	-0.5	1.1	-0.3	0.0
Wearing Apparel, Dressing And Dying Of Fur	-0.2	0.4	-0.5	1.4	-0.7	1.1	0.2	0.8	-0.9	1.5	-0.3	0.0
Leather, leather and footwear	-0.4	0.3	-0.4	0.5	-0.3	0.3	-0.1	0.6	-0.5	0.9	-0.1	0.0
Wood, wood products and cork	0.3	0.7	0.1	0.2	0.0	0.2	0.3	0.6	-0.2	0.9	-0.2	0.0
Pulp, paper and paper	-0.1	0.0	0.1	-0.3	0.0	-0.2	-0.3	0.2	-0.2	0.3	-0.1	0.0
Printing, publishing and reproduction	0.2	-0.5	-0.2	-0.2	0.2	-0.7	0.0	-0.4	-0.1	0.0	-0.2	0.0
Coke, refined petroleum and nuclear fuel	-0.1	0.1	-0.1	0.1	-0.1	0.1	-0.1	0.2	-0.1	0.0	0.0	0.0
Chemicals and chemical	0.0	-0.3	-0.5	0.6	-0.3	-0.2	-0.6	0.1	0.1	0.3	-0.2	0.0
Rubber and plastics	0.6	-0.1	0.2	-0.1	0.2	-0.2	0.2	-0.1	0.1	0.5	-0.1	0.0
Other non-metallic mineral	0.0	0.7	-0.1	0.0	-0.2	0.2	-0.1	0.5	-0.2	0.4	-0.1	0.0
Basic metals	-0.8	1.3	0.1	0.1	-0.6	0.3	-0.1	0.7	-0.2	0.4	-0.2	0.0
Fabricated metal	0.6	0.7	0.1	-0.4	0.3	-0.9	0.5	0.2	0.5	1.1	-0.2	0.0
Machinery, n.e.c.	-0.5	1.3	-0.7	0.2	-0.6	-0.3	-1.2	1.5	-0.4	1.2	-0.3	0.0
Office, accounting and computing machinery	0.1	0.0	0.1	0.0	0.0	-0.1	0.1	0.0	0.0	0.0	0.0	0.0
Electrical machinery and apparatus, nec	0.7	0.4	0.4	0.2	0.0	-0.4	1.1	0.3	0.0	0.6	-0.2	0.0
Radio, television and communication equipment	0.3	-0.1	1.3	0.1	-0.1	-0.2	0.0	0.0	0.0	0.2	-0.1	0.0
Medical, precision and optical instruments	0.1	0.0	-0.1	0.0	0.0	-0.3	-0.1	0.0	0.2	0.1	-0.1	0.0
Motor vehicles, trailers and semi-trailers	0.8	-0.1	0.6	-0.5	0.0	-0.5	0.5	-0.5	-0.1	-0.2	0.0	0.0
Other transport equipment	-0.3	0.2	-0.1	-0.2	-0.2	0.2	-0.2	0.1	-0.1	-0.1	-0.1	0.0
Manufacture, n.e.c, Recycling	0.2	0.2	0.2	-0.2	0.2	0.0	0.0	0.0	-0.1	0.8	-0.2	0.0
Electricity, gas and water supply	-0.3	0.8	-1.0	1.8	-0.2	0.8	0.0	1.1	-0.1	0.6	-0.2	0.0
Construction	-1.0	2.7	2.1	-1.6	-1.3	-2.5	0.5	-0.7	1.5	-1.6	0.1	0.0
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of fuel	0.7	-1.0	1.1	-1.2	0.4	-1.2	0.5	-1.6	0.2	-0.8	0.0	0.0
Wholesale trade and commission trade, except of motor vehicles and motorcycles	-0.1	0.2	0.5	-3.0	-0.1	-0.2	1.6	0.5	-0.3	0.2	-0.1	0.0
Retail trade, except of motor vehicles and motorcycles; repair of household goods	-0.5	0.2	-0.4	1.9	0.0	-0.5	2.7	-2.5	-0.1	-2.8	-0.2	0.0
Hotels and restaurants	0.7	-1.1	0.5	-1.1	0.0	-3.2	0.2	-2.0	0.2	-1.4	0.5	0.0
Inland transport	0.3	1.6	-1.1	3.3	-0.4	0.2	-0.6	2.1	0.1	0.5	-0.2	0.0
Water transport	-0.1	0.0	-0.1	0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
Air transport	0.0	-0.1	0.0	0.0	0.0	-0.2	0.0	-0.2	0.0	-0.1	0.0	0.0
Supporting and auxiliary transport activities; activities of travel agencies	0.4	-0.6	0.3	-0.9	0.1	-0.8	0.2	-0.6	0.0	-0.3	0.4	0.0
Post and telecommunications	-0.2	0.1	-0.5	0.7	-0.1	-0.4	-0.2	0.1	0.4	-0.6	-0.2	0.0
Financial intermediation, except insurance and pension funding	-0.2	-0.8	-0.1	-0.4	0.1	-0.9	0.1	-0.8	0.4	-0.9	-0.1	0.0
Insurance and pension funding, except compulsory social security	0.0	-0.3	0.0	0.0	-0.2	-0.2	0.2	-0.4	0.3	-0.3	-0.1	0.0
Activities related to financial intermediation	0.4	-0.6	0.0	-0.6	0.2	-0.6	0.1	-0.7	-0.1	-0.4	0.0	0.0
Real estate activities	0.2	0.0	-0.1	-0.4	0.2	0.1	-0.1	0.0	0.3	-0.8	0.1	0.0
Renting of machinery and equipment	0.0	-0.1	0.1	-0.3	0.0	-0.2	0.0	-0.1	0.0	-0.2	0.0	0.0
Computer and related activities	0.3	-0.3	0.5	-0.6	0.2	-0.8	0.3	-0.4	0.6	-0.7	0.7	0.0
Research and development	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.4	0.6	0.1	-0.1	0.0	0.0
Other business activities	1.4	-1.9	2.6	-4.8	2.2	-5.5	2.8	-4.1	1.2	-2.0	2.5	0.0
Public administration and defence; compulsory social security	0.5	-1.8	0.5	-0.2	1.3	-3.4	0.2	-1.1	1.9	-3.8	-0.8	0.0
Education	0.2	-0.9	-0.5	2.7	0.8	-1.4	-1.0	3.9	1.2	-0.7	0.4	0.0
Health and social work	0.0	-2.9	0.6	-1.8	-1.4	-2.4	-0.4	-1.5	0.8	-3.6	0.6	0.0
Sewage and refuse disposal, sanitation and similar activities	0.1	-0.1	-0.1	0.0	0.1	-0.3	-0.2	0.4	0.1	-0.4	0.1	0.0
Activities of membership organizations nec	0.2	-0.4	0.0	-0.4	0.0	-0.2	0.3	-0.4	-0.2	-0.2	0.0	0.0
Recreational, cultural and sporting activities	0.1	-0.4	0.1	0.2	0.1	-0.8	-0.6	0.3	0.4	-0.7	0.3	0.0
Other service activities	0.2	-0.5	-0.8	0.9	0.2	-0.9	0.1	-0.6	0.0	-0.5	0.1	0.0
Private households with employed persons	0.0	-1.5	0.0	-1.5	0.0	-1.4	0.0	-1.5	-0.1	-1.4	0.3	0.0

Table A.4.1a

Shares of gross output in total manufacturing

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU10	
	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004
Food, beverages and tobacco	17.4	11.8	23.7	13.6	23.8	22.1	14.6	8.8	11.7	9.4	13.5	12.5
Textiles, leather and footwear	7.6	3.8	8.8	3.8	7.9	4.6	6.4	5.4	11.9	8.5	7.3	5.3
Wood and cork	2.7	2.8	2.2	1.4	3.6	3.5	2.9	2.9	4.2	3.0	2.0	1.9
Pulp, paper, printing and publishing	4.7	4.4	6.3	4.5	6.2	6.6	7.2	5.2	8.4	6.7	7.1	6.5
Chemicals, rubber, plastics and fuel	14.0	13.6	19.7	15.3	17.1	18.6	21.8	15.6	14.8	16.6	17.8	18.4
Other non-metallic mineral	5.2	4.9	3.5	2.9	4.6	5.1	4.3	3.8	3.7	3.7	4.0	3.5
Basic and fabricated metals	18.7	15.7	11.5	8.4	12.5	11.2	20.1	16.6	13.7	16.7	13.4	13.3
Machinery, n.e.c.	9.5	8.0	6.1	5.7	6.8	5.6	7.8	7.3	8.3	10.2	10.2	10.4
Electrical and optical equipment	8.4	16.4	9.1	29.7	6.2	7.6	6.1	10.6	9.4	11.5	9.7	10.0
Transport equipment	7.7	15.0	7.1	13.3	6.9	9.7	5.9	20.4	8.9	8.9	10.8	13.9
Manufacturing n.e.c., recycling	4.0	3.7	1.9	1.5	4.5	5.3	3.0	3.6	5.0	4.8	4.3	4.4

Table A.4.1b

Shares of value added in total manufacturing

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU10	
	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004
Food, beverages and tobacco	14.5	12.9	18.6	12.6	17.8	16.8	13.0	7.7	11.2	9.1	10.3	10.4
Textiles, leather and footwear	7.9	4.2	8.8	4.0	10.7	6.0	7.4	5.9	12.5	7.1	7.2	5.4
Wood and cork	3.7	3.6	2.6	1.7	3.5	4.3	3.3	4.6	3.9	3.2	2.1	2.0
Pulp, paper, printing and publishing	5.6	5.7	5.8	5.3	7.7	7.7	8.3	6.1	8.6	7.2	8.1	8.0
Chemicals, rubber, plastics and fuel	11.9	12.2	23.7	19.8	15.5	16.2	25.6	15.8	16.2	20.1	16.9	16.6
Other non-metallic mineral	6.9	7.6	5.0	4.0	5.6	7.2	5.0	5.4	4.9	4.5	5.0	4.2
Basic and fabricated metals	20.3	16.3	10.9	9.4	12.6	11.1	15.2	22.3	13.6	16.2	14.4	14.5
Machinery, n.e.c.	11.3	9.8	7.1	6.4	8.4	7.7	9.1	8.1	7.9	10.3	11.4	12.0
Electrical and optical equipment	7.4	11.9	9.3	23.8	7.0	8.6	5.9	10.1	11.0	12.0	10.7	11.4
Transport equipment	5.4	11.8	5.7	11.0	6.0	8.2	4.3	10.2	4.3	4.9	9.2	10.6
Manufacturing n.e.c., recycling	5.1	4.0	2.6	2.0	5.0	6.1	3.0	3.7	6.0	5.4	4.6	4.8

Table A.4.1c

Shares of hours worked in total manufacturing

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia		EU10	
	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004
Food, beverages and tobacco	11.5	10.9	18.7	16.2	18.1	19.1	11.5	10.5	7.5	8.8	12.6	13.3
Textiles, leather and footwear	13.8	8.6	18.1	12.4	18.3	12.5	14.9	14.0	18.5	13.0	9.8	7.4
Wood and cork	5.2	6.2	3.9	4.3	4.5	5.7	5.2	6.4	5.3	5.1	3.3	3.2
Pulp, paper, printing and publishing	4.4	4.6	5.3	5.0	4.2	5.7	5.7	4.7	6.7	6.4	8.6	8.5
Chemicals, rubber, plastics and fuel	6.7	8.2	11.2	10.2	8.7	9.9	9.1	7.6	9.7	11.3	10.8	11.0
Other non-metallic mineral	6.2	5.8	3.9	3.6	5.9	5.5	5.6	5.2	4.6	4.2	4.8	4.8
Basic and fabricated metals	18.1	17.0	10.4	11.6	11.1	11.9	14.5	16.5	14.7	17.1	14.2	14.8
Machinery, n.e.c.	12.9	10.9	10.0	6.9	9.5	7.5	14.4	9.8	11.1	10.9	10.7	10.9
Electrical and optical equipment	9.4	13.7	10.5	18.3	6.7	7.0	9.6	14.3	10.5	11.9	11.1	10.8
Transport equipment	6.5	8.1	3.8	6.1	6.9	6.7	4.6	6.1	4.6	4.3	8.3	9.1
Manufacturing n.e.c., recycling	5.3	6.0	4.3	5.4	6.1	8.5	4.9	4.9	6.8	6.9	6.0	6.1

Source: EU KLEMS database; own calculations.

Table A.4.2

Average annual growth rates of labour and multifactor productivity in manufacturing, 1995-2004

Growth rates of labour productivity	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU10*
Food, beverages and tobacco	2.39	-4.02	8.99	-3.71	-0.39	0.64
Textiles, leather and footwear	4.76	1.77	5.71	5.36	4.07	1.22
Wood and cork	4.27	3.02	9.13	11.67	4.48	3.06
Pulp, paper, printing and publishing	5.81	8.44	3.05	7.37	5.54	1.64
Chemicals, rubber, plastics and fuel	0.67	-1.30	3.19	5.81	6.86	2.61
Other non-metallic mineral	6.75	3.75	20.72	8.12	5.55	1.80
Basic and fabricated metals	-0.63	4.69	8.33	8.31	6.08	1.84
Machinery, n.e.c.	5.03	11.80	10.83	10.81	9.35	1.58
Electrical and optical equipment	9.78	15.46	11.27	10.81	8.85	5.03
Transport equipment	10.55	11.40	11.25	11.94	9.97	2.31
Manufacturing n.e.c., recycling	1.74	1.27	6.49	11.57	5.48	1.13
Growth rates of multifactor productivity						
Food, beverages and tobacco	-0.92	-4.32	7.11	n.a.	-2.34	-0.27
Textiles, leather and footwear	2.61	1.07	4.79	n.a.	2.87	-0.25
Wood and cork	3.08	2.41	7.04	n.a.	3.24	1.80
Pulp, paper, printing and publishing	3.04	7.07	2.03	n.a.	3.60	0.05
Chemicals, rubber, plastics and fuel	-2.00	-3.69	2.34	n.a.	4.24	1.45
Other non-metallic mineral	4.42	2.00	18.25	n.a.	3.55	0.59
Basic and fabricated metals	-2.01	4.07	8.73	n.a.	4.99	0.73
Machinery, n.e.c.	2.60	9.70	10.21	n.a.	7.00	0.54
Electrical and optical equipment	6.41	15.07	9.47	n.a.	6.89	3.40
Transport equipment	5.61	9.02	8.99	n.a.	7.58	0.95
Manufacturing n.e.c., recycling	-0.03	-0.36	5.51	n.a.	4.57	0.11

Source: EU KLEMS database; own calculations.

Table A.4.3

Productivity gaps (VA per hour worked) in % of Austria

	Czech Republic		Hungary		Poland		Slovak Republic		Slovenia	
	1995	2004	1995	2004	1995	2004	1995	2004	1995	2004
Food, beverages and tobacco	56.8	53.9	51.6	42.8	29.2	21.8	39.2	48.1	64.4	51.8
Textiles, leather and footwear	34.1	24.7	29.4	27.8	18.9	18.3	30.7	26.2	28.8	30.0
Wood and cork	34.7	42.4	31.2	31.3	28.0	25.1	33.9	51.0	47.1	31.5
Pulp, paper, printing and publishing	40.6	45.9	45.1	33.7	38.6	47.4	53.1	47.2	46.0	48.2
Chemicals, rubber, plastics and fuel	51.7	28.7	42.5	59.2	27.8	40.7	46.3	38.4	47.7	83.9
Other non-metallic mineral	39.3	44.0	51.3	44.1	47.2	44.0	29.9	47.1	137.2	32.6
Basic and fabricated metals	42.6	34.2	28.2	38.1	42.8	40.8	38.3	47.7	56.9	40.9
Machinery, n.e.c.	34.3	34.8	38.5	26.8	39.2	55.3	30.8	41.8	58.3	25.5
Electrical and optical equipment	29.5	37.4	42.8	31.7	62.2	76.6	34.8	51.7	57.7	23.5
Transport equipment	28.4	44.1	41.7	49.1	86.0	78.0	25.9	38.3	40.5	32.3
Manufacturing n.e.c., recycling	61.2	40.6	44.2	37.0	22.9	25.6	46.1	41.2	51.0	39.6

Source: EU KLEMS database; own calculations.

Table A.5.1

Employment: average annual growth rates and contributions to growth, 1995-2004

Code	Industry	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
Average annual hours worked (growth rates in per cent)							
Total	Total economy	-0.48	0.77	-0.41	-0.27	-0.21	1.18
A-B	Agriculture, hunting, forestry and fishing	-5.68	-4.39	0.31	-8.17	-3.54	-1.90
C-F	Industry and construction	-1.08	0.70	-2.94	-1.05	-1.22	-0.34
G-K	Market services	0.44	2.15	1.23	2.40	0.89	2.15
L-P	Community, social and private services	0.41	0.46	-0.18	-0.52	2.26	1.58
A	Agriculture, hunting and forestry	-5.70	-4.43	0.34	-8.18	-3.56	-1.96
B	Fishing	-3.85	2.60	-9.57	-1.47	2.35	0.03
C	Mining and quarrying	-8.01	-8.57	-7.15	-8.29	-8.35	-4.56
D	Total manufacturing	-0.36	0.54	-2.44	-1.24	-1.68	-0.74
E	Electricity, gas and water supply	-2.89	-5.05	-1.79	-0.55	-1.47	-2.02
F	Construction	-1.93	3.81	-3.69	0.20	1.53	0.93
G	Wholesale and retail trade	-0.66	1.95	0.55	4.21	-0.30	1.12
H	Hotels and restaurants	1.65	2.83	1.93	-0.16	0.88	2.63
I	Transport and storage and communication	0.04	-1.00	-1.45	-1.61	0.23	1.03
J	Financial intermediation	0.69	-0.33	0.32	2.36	2.33	0.34
K	Real estate, renting and business activities	2.11	8.27	6.04	4.15	3.00	4.40
L	Public admin and defence; compul. soc. sec.	0.46	1.06	1.57	0.89	4.09	-0.05
M	Education	0.21	-0.15	1.10	-1.35	1.89	1.51
N	Health and social work	-0.03	1.73	-3.88	-0.17	1.20	2.14
O	Other community, social and personal services	1.31	-1.10	1.18	-1.65	2.00	2.38
P	Private households with employed persons	3.98	-1.62	3.45	0.00	-1.18	2.94
Contributions to growth (growth rates weighted with average shares in total hours worked)							
Total	Total economy	-0.48	0.77	-0.41	-0.27	-0.21	1.18
A-B	Agriculture, hunting, forestry and fishing	-0.29	-0.30	0.09	-0.51	-0.44	-0.07
C-F	Industry and construction	-0.43	0.23	-0.79	-0.38	-0.46	-0.09
G-K	Market services	0.15	0.70	0.32	0.78	0.28	0.87
L-P	Community, social and private services	0.08	0.12	-0.04	-0.13	0.43	0.47
A	Agriculture, hunting and forestry	-0.29	-0.30	0.09	-0.51	-0.44	-0.07
B	Fishing	0.00	0.00	-0.01	0.00	0.00	0.00
C	Mining and quarrying	-0.11	-0.05	-0.13	-0.06	-0.06	-0.01
D	Total manufacturing	-0.10	0.13	-0.45	-0.32	-0.48	-0.13
E	Electricity, gas and water supply	-0.04	-0.11	-0.03	-0.01	-0.02	-0.01
F	Construction	-0.18	0.26	-0.19	0.01	0.11	0.07
G	Wholesale and retail trade	-0.10	0.27	0.07	0.59	-0.04	0.17
H	Hotels and restaurants	0.06	0.10	0.03	0.00	0.03	0.12
I	Transport and storage and communication	0.00	-0.08	-0.07	-0.12	0.01	0.06
J	Financial intermediation	0.01	-0.01	0.01	0.04	0.05	0.01
K	Real estate, renting and business activities	0.18	0.43	0.30	0.26	0.22	0.52
L	Public admin and defence; compul. soc. sec.	0.03	0.08	0.08	0.06	0.20	0.00
M	Education	0.01	-0.01	0.07	-0.12	0.11	0.10
N	Health and social work	0.00	0.11	-0.23	-0.01	0.06	0.20
O	Other community, social and personal services	0.04	-0.05	0.03	-0.06	0.06	0.11
P	Private households with employed persons	0.00	0.00	0.00	0.00	0.00	0.07

Source: EU KLEMS database, March 2007, wiiw calculations.

Table A.5.2

Hours worked: average annual growth rates and contributions to growth, 1995-2004

Code	Industry	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
Average annual hours worked (growth rates in per cent)							
Total	Total economy	-0.83	0.54	-0.52	-1.19	-0.46	0.78
A-B	Agriculture, hunting, forestry and fishing	-6.36	-3.90	0.09	-9.44	-4.79	-2.30
C-F	Industry and construction	-1.33	0.50	-2.94	-1.30	-0.94	-0.50
G-K	Market services	0.17	1.62	0.65	1.25	0.70	1.73
L-P	Community, social and private services	-0.01	0.38	0.18	-2.01	2.40	1.18
A	Agriculture, hunting and forestry	-6.37	-3.93	0.11	-9.44	-4.81	-2.34
B	Fishing	-4.33	0.94	-8.16	-3.41	1.33	-1.19
C	Mining and quarrying	-8.45	-9.23	-6.93	-8.42	-8.26	-4.52
D	Total manufacturing	-0.68	0.23	-2.48	-1.37	-1.44	-0.97
E	Electricity, gas and water supply	-3.25	-4.98	-1.92	-1.19	-1.28	-2.55
F	Construction	-1.88	3.74	-3.64	-0.45	1.87	0.86
G	Wholesale and retail trade	-0.82	1.44	-0.20	2.57	-0.57	0.66
H	Hotels and restaurants	1.27	2.05	-0.03	-0.23	0.26	1.98
I	Transport and storage and communication	-0.20	-1.21	-1.51	-2.37	0.42	0.71
J	Financial intermediation	0.35	-0.39	0.37	1.77	2.53	0.16
K	Real estate, renting and business activities	1.70	7.39	5.71	2.73	2.75	4.05
L	Public admin and defence; compul. soc. sec.	0.12	1.21	2.66	-0.91	4.15	-0.43
M	Education	-0.17	-0.23	1.63	-2.57	2.41	1.52
N	Health and social work	-0.72	1.48	-3.71	-1.98	1.24	1.63
O	Other community, social and personal services	1.11	-1.48	1.03	-2.67	1.65	2.08
P	Private households with employed persons	0.58	-5.47	5.02	0.00	-1.57	2.21
Contributions to growth (growth rates weighted with average shares in total hours worked)							
Total	Total economy	-0.83	0.54	-0.52	-1.19	-0.46	0.78
A-B	Agriculture, hunting, forestry and fishing	-0.36	-0.28	0.03	-0.63	-0.74	-0.11
C-F	Industry and construction	-0.53	0.17	-0.76	-0.45	-0.35	-0.14
G-K	Market services	0.06	0.55	0.17	0.41	0.21	0.71
L-P	Community, social and private services	0.00	0.10	0.03	-0.50	0.40	0.31
A	Agriculture, hunting and forestry	-0.36	-0.28	0.03	-0.63	-0.74	-0.11
B	Fishing	0.00	0.00	0.00	0.00	0.00	0.00
C	Mining and quarrying	-0.11	-0.05	-0.11	-0.06	-0.06	-0.01
D	Total manufacturing	-0.18	0.06	-0.44	-0.34	-0.40	-0.18
E	Electricity, gas and water supply	-0.05	-0.11	-0.03	-0.02	-0.02	-0.02
F	Construction	-0.19	0.26	-0.19	-0.03	0.13	0.07
G	Wholesale and retail trade	-0.12	0.20	-0.03	0.39	-0.07	0.10
H	Hotels and restaurants	0.05	0.08	0.00	-0.01	0.01	0.09
I	Transport and storage and communication	-0.01	-0.10	-0.07	-0.18	0.03	0.04
J	Financial intermediation	0.01	-0.01	0.01	0.03	0.05	0.00
K	Real estate, renting and business activities	0.14	0.39	0.28	0.19	0.20	0.48
L	Public admin and defence; compul. soc. sec.	0.01	0.09	0.12	-0.06	0.19	-0.03
M	Education	-0.01	-0.02	0.06	-0.21	0.12	0.08
N	Health and social work	-0.04	0.09	-0.19	-0.13	0.06	0.13
O	Other community, social and personal services	0.03	-0.07	0.02	-0.10	0.05	0.09
P	Private households with employed persons	0.00	0.00	0.00	0.00	0.00	0.04

Source: EU KLEMS database, March 2007, wiiw calculations.

Table A.5.3

Hours worked of low-skilled employed: average annual growth rates and contributions to growth, 1995-2004

Code	Industry	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
Average annual hours worked (growth rates in per cent)							
Total	Total economy	-4.98	-2.47	-2.73	-8.49	-4.66	-1.25
A-B	Agriculture, hunting, forestry and fishing	-10.21	-6.46	-2.20	-16.87	-7.95	-3.75
C-F	Industry and construction	-4.79	-1.16	-5.64	-7.38	-2.63	-2.12
G-K	Market services	-4.04	-0.21	0.06	-5.57	-2.25	0.22
L-P	Community, social and private services	-2.93	-3.90	-4.07	-6.98	-2.34	-1.13
A	Agriculture, hunting and forestry	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
B	Fishing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
C	Mining and quarrying	-13.47	-11.48	-10.56	-17.87	-16.97	-7.09
D	Total manufacturing	-3.98	-1.46	-5.47	-7.67	-3.00	-3.43
E	Electricity, gas and water supply	-8.27	-7.23	-5.54	-10.64	-9.99	-5.71
F	Construction	-7.01	2.27	-5.34	-5.30	0.76	0.63
G	Wholesale and retail trade	-4.62	-1.08	-2.36	-2.95	-1.31	-1.05
H	Hotels and restaurants	-2.53	-0.47	-2.18	-5.75	-0.48	0.29
I	Transport and storage and communication	-5.72	-3.84	-8.05	-9.21	-1.36	-0.70
J	Financial intermediation	-2.36	-5.04	-0.63	-1.86	-4.83	-4.36
K	Real estate, renting and business activities	-2.42	6.96	7.20	-4.89	-3.45	2.31
L	Public admin and defence; compul. soc. sec.	-3.13	-2.94	-3.51	-13.75	-3.41	-4.17
M	Education	-5.52	-2.29	1.52	-10.17	0.91	-1.66
N	Health and social work	-1.76	-4.49	-9.18	-2.00	-2.78	-0.43
O	Other community, social and personal services	-2.09	-6.45	-2.83	-4.07	-4.17	0.76
P	Private households with employed persons	-2.62	0.00	1.16	0.00	-7.39	-0.01
Contributions to growth (growth rates weighted with average shares in total hours worked)							
Total	Total economy	-0.42	-0.43	-0.51	-0.65	-1.09	-0.27
A-B	Agriculture, hunting, forestry and fishing	-0.09	-0.18	-0.29	-0.23	-0.78	-0.07
C-F	Industry and construction	-0.20	-0.08	-0.16	-0.21	-0.24	-0.15
G-K	Market services	-0.09	-0.01	0.00	-0.09	-0.07	0.02
L-P	Community, social and private services	-0.03	-0.14	-0.04	-0.12	-0.04	-0.05
A	Agriculture, hunting and forestry	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
B	Fishing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
C	Mining and quarrying	-0.01	-0.01	-0.01	-0.01	-0.01	0.00
D	Total manufacturing	-0.13	-0.08	-0.11	-0.17	-0.23	-0.16
E	Electricity, gas and water supply	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01
F	Construction	-0.05	0.03	-0.04	-0.03	0.01	0.01
G	Wholesale and retail trade	-0.05	-0.02	-0.02	-0.02	-0.01	-0.04
H	Hotels and restaurants	-0.01	0.00	0.00	-0.01	0.00	0.00
I	Transport and storage and communication	-0.04	-0.06	-0.03	-0.05	-0.01	-0.01
J	Financial intermediation	0.00	0.00	0.00	0.00	-0.01	-0.01
K	Real estate, renting and business activities	-0.01	0.03	0.02	-0.01	-0.03	0.05
L	Public admin and defence; compul. soc. sec.	-0.01	-0.03	0.00	-0.04	-0.01	-0.04
M	Education	-0.01	-0.02	0.00	-0.06	0.00	-0.01
N	Health and social work	-0.01	-0.05	-0.03	-0.01	-0.01	-0.01
O	Other community, social and personal services	-0.01	-0.04	-0.01	-0.01	-0.01	0.01
P	Private households with employed persons	0.00	0.00	0.00	0.00	0.00	0.00

Source: EU KLEMS database, March 2007, wiiw calculations.

Table A.5.4

Hours worked of medium-skilled employed: average annual growth rates and contributions to growth, 1995-2004

Code	Industry	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
Average annual hours worked (growth rates in per cent)							
Total	Total economy	-0.77	0.56	-0.77	-0.93	-0.03	0.78
A-B	Agriculture, hunting, forestry and fishing	-5.89	-2.62	1.40	-7.84	-0.84	-1.70
C-F	Industry and construction	-1.09	0.70	-3.21	-0.86	-0.70	-0.22
G-K	Market services	0.39	1.51	0.07	1.21	0.79	1.74
L-P	Community, social and private services	-0.31	0.16	-0.89	-2.29	1.56	1.11
A	Agriculture, hunting and forestry	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
B	Fishing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
C	Mining and quarrying	-8.40	-9.47	-7.37	-8.15	-7.40	-4.23
D	Total manufacturing	-0.36	0.53	-2.77	-0.84	-1.23	-0.50
E	Electricity, gas and water supply	-3.21	-5.22	-2.35	-0.92	-0.42	-2.17
F	Construction	-1.74	3.69	-3.73	-0.28	1.75	0.72
G	Wholesale and retail trade	-0.62	1.43	-0.70	2.81	-0.80	0.93
H	Hotels and restaurants	1.47	2.05	-0.52	0.01	0.03	2.35
I	Transport and storage and communication	0.07	-1.17	-1.60	-2.02	0.10	0.74
J	Financial intermediation	-0.54	-1.92	-2.17	0.98	2.07	-0.37
K	Real estate, renting and business activities	1.66	6.38	3.66	1.56	2.96	3.37
L	Public admin and defence; compul. soc. sec.	-0.24	0.84	1.29	-1.47	3.33	-0.47
M	Education	-0.96	-1.59	0.87	-3.76	-0.16	0.67
N	Health and social work	-0.97	1.64	-3.94	-2.23	1.60	1.82
O	Other community, social and personal services	1.15	-1.62	0.17	-1.61	0.83	2.08
P	Private households with employed persons	0.62	0.00	4.15	0.00	-2.39	2.73
Contributions to growth (growth rates weighted with average shares in total hours worked)							
Total	Total economy	-0.61	0.37	-0.54	-0.73	-0.02	0.51
A-B	Agriculture, hunting, forestry and fishing	-0.26	-0.11	0.26	-0.38	-0.04	-0.05
C-F	Industry and construction	-0.36	0.17	-0.67	-0.25	-0.17	-0.04
G-K	Market services	0.11	0.38	0.01	0.33	0.18	0.48
L-P	Community, social and private services	-0.04	0.02	-0.08	-0.38	0.14	0.18
A	Agriculture, hunting and forestry	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
B	Fishing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
C	Mining and quarrying	-0.09	-0.04	-0.09	-0.05	-0.04	-0.01
D	Total manufacturing	-0.08	0.09	-0.39	-0.18	-0.22	-0.06
E	Electricity, gas and water supply	-0.04	-0.09	-0.03	-0.02	0.00	-0.01
F	Construction	-0.15	0.20	-0.15	-0.02	0.10	0.04
G	Wholesale and retail trade	-0.08	0.16	-0.08	0.37	-0.08	0.10
H	Hotels and restaurants	0.05	0.06	-0.01	0.00	0.00	0.08
I	Transport and storage and communication	0.00	-0.07	-0.06	-0.13	0.00	0.03
J	Financial intermediation	-0.01	-0.03	-0.02	0.01	0.03	-0.01
K	Real estate, renting and business activities	0.09	0.18	0.11	0.07	0.12	0.23
L	Public admin and defence; compul. soc. sec.	-0.01	0.04	0.04	-0.07	0.08	-0.02
M	Education	-0.02	-0.03	0.01	-0.15	0.00	0.02
N	Health and social work	-0.04	0.06	-0.14	-0.11	0.04	0.10
O	Other community, social and personal services	0.03	-0.05	0.00	-0.05	0.01	0.06
P	Private households with employed persons	0.00	0.00	0.00	0.00	0.00	0.03

Source: EU KLEMS database, March 2007, wiiw calculations.

Table A.5.5

Hours worked of high-skilled employed: average annual growth rates and contributions to growth, 1995-2004

Code	Industry	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
Average annual hours worked (growth rates in per cent)							
Total	Total economy	1.43	3.27	3.88	1.07	3.58	4.27
A-B	Agriculture, hunting, forestry and fishing	-2.89	-1.92	5.96	-8.20	5.79	2.36
C-F	Industry and construction	0.68	2.80	2.33	0.49	1.71	3.00
G-K	Market services	2.16	6.32	6.86	4.37	3.83	6.09
L-P	Community, social and private services	1.52	2.31	2.56	-0.17	4.34	3.18
A	Agriculture, hunting and forestry	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
B	Fishing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
C	Mining and quarrying	-4.55	-5.25	-0.92	-5.37	-7.81	-0.76
D	Total manufacturing	1.06	2.32	3.27	-0.39	1.59	2.82
E	Electricity, gas and water supply	0.64	-1.01	4.10	1.87	-0.83	-0.42
F	Construction	0.58	7.70	-0.56	3.77	5.84	4.77
G	Wholesale and retail trade	0.21	4.50	4.91	3.06	1.82	4.96
H	Hotels and restaurants	2.30	5.12	5.09	0.25	2.64	7.60
I	Transport and storage and communication	3.75	2.97	4.06	1.54	4.57	5.63
J	Financial intermediation	2.87	3.09	4.36	3.52	4.98	4.03
K	Real estate, renting and business activities	2.29	8.85	9.38	5.19	4.04	6.62
L	Public admin and defence; compul. soc. sec.	1.99	4.02	5.85	2.78	6.28	3.10
M	Education	1.42	0.75	1.99	-0.06	4.13	3.05
N	Health and social work	0.51	4.73	-1.68	-0.89	1.76	2.79
O	Other community, social and personal services	2.93	2.29	6.31	-7.80	6.12	4.56
P	Private households with employed persons	2.40	0.00	10.30	0.00	2.90	5.74
Contributions to growth (growth rates weighted with average shares in total hours worked)							
Total	Total economy	0.17	0.55	0.46	0.14	0.55	0.54
A-B	Agriculture, hunting, forestry and fishing	-0.01	-0.01	0.03	-0.03	0.02	0.00
C-F	Industry and construction	0.02	0.07	0.05	0.01	0.06	0.05
G-K	Market services	0.10	0.31	0.27	0.20	0.19	0.31
L-P	Community, social and private services	0.07	0.20	0.14	-0.01	0.29	0.18
A	Agriculture, hunting and forestry	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
B	Fishing	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
C	Mining and quarrying	0.00	0.00	0.00	0.00	-0.01	0.00
D	Total manufacturing	0.02	0.04	0.05	-0.01	0.04	0.04
E	Electricity, gas and water supply	0.00	0.00	0.00	0.00	0.00	0.00
F	Construction	0.00	0.04	0.00	0.02	0.03	0.02
G	Wholesale and retail trade	0.00	0.06	0.07	0.03	0.02	0.04
H	Hotels and restaurants	0.01	0.02	0.01	0.00	0.01	0.01
I	Transport and storage and communication	0.01	0.02	0.02	0.01	0.03	0.02
J	Financial intermediation	0.01	0.02	0.03	0.02	0.03	0.02
K	Real estate, renting and business activities	0.06	0.17	0.13	0.12	0.09	0.21
L	Public admin and defence; compul. soc. sec.	0.02	0.08	0.08	0.04	0.11	0.04
M	Education	0.03	0.03	0.05	0.00	0.11	0.07
N	Health and social work	0.01	0.07	-0.02	-0.01	0.03	0.04
O	Other community, social and personal services	0.01	0.02	0.02	-0.05	0.04	0.03
P	Private households with employed persons	0.00	0.00	0.00	0.00	0.00	0.01

Source: EU KLEMS database, March 2007, wiiw calculations.

Table A.5.6

Labour services and labour composition: average annual growth rates, 1995-2004

Code	Industry	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
Average annual labour services (growth rates in per cent)							
Total	Total economy	-0.36	1.67	0.14	-0.66	0.23	1.01
A-B	Agriculture, hunting, forestry and fishing	-6.00	-3.58	0.41	-8.91	-4.08	-1.78
J-K	Finance, insurance, real estate and busin. serv.	1.71	5.82	4.52	3.17	2.87	3.22
L-P	Community, social and private services	0.37	1.26	1.16	-1.50	2.52	1.24
A	Agriculture, hunting and forestry	0.00	0.00	0.00	0.00	0.00	0.00
B	Fishing	0.00	0.00	0.00	0.00	0.00	0.00
C	Mining and quarrying	-7.99	-8.27	-6.49	-7.90	-8.01	-4.53
D	Total manufacturing	-0.28	0.75	-1.97	-1.23	-0.96	-0.49
E	Electricity, gas and water supply	-2.79	-4.03	-1.47	-0.67	-1.03	-2.41
F	Construction	-1.49	4.29	-3.25	-0.16	2.33	1.07
G	Wholesale and retail trade	-0.39	2.81	0.15	2.60	-0.36	0.73
H	Hotels and restaurants	1.60	2.73	0.36	-0.10	0.41	2.41
I	Transport and storage and communication	0.09	-0.29	-1.11	-1.71	0.81	1.01
J	Financial intermediation	1.30	1.18	0.94	2.49	3.27	0.66
K	Real estate, renting and business activities	1.83	7.61	6.22	3.29	2.67	4.38
L	Public admin and defence; compul. soc. sec.	0.45	2.12	3.20	-0.27	4.52	0.18
M	Education	0.27	0.34	1.53	-1.85	2.32	1.34
N	Health and social work	-0.29	2.22	-3.30	-1.82	0.93	1.85
O	Other community, social and personal services	1.40	-0.57	1.50	-3.51	1.92	2.12
P	Private households with employed persons	0.87	0.00	5.49	0.00	-1.30	2.13
Average annual labour composition growth rates							
Total	Total economy	0.47	1.13	0.66	0.53	0.69	0.23
A-B	Agriculture, hunting, forestry and fishing	0.36	0.32	0.32	0.53	0.71	0.52
J-K	Finance, insurance, real estate and busin. serv.	0.22	0.75	0.15	0.60	0.17	0.00
L-P	Community, social and private services	0.38	0.88	0.98	0.51	0.13	0.06
A	Agriculture, hunting and forestry	0.00	0.00	0.00	0.00	0.00	0.00
B	Fishing	0.00	0.00	0.00	0.00	0.00	0.00
C	Mining and quarrying	0.46	0.96	0.45	0.52	0.25	-0.01
D	Total manufacturing	0.40	0.52	0.51	0.15	0.49	0.48
E	Electricity, gas and water supply	0.46	0.96	0.45	0.52	0.25	0.14
F	Construction	0.39	0.55	0.39	0.29	0.46	0.20
G	Wholesale and retail trade	0.43	1.37	0.35	0.03	0.21	0.07
H	Hotels and restaurants	0.33	0.68	0.39	0.13	0.16	0.43
I	Transport and storage and communication	0.29	0.92	0.40	0.67	0.39	0.30
J	Financial intermediation	0.95	1.56	0.57	0.72	0.74	0.51
K	Real estate, renting and business activities	0.12	0.22	0.50	0.56	-0.08	0.32
L	Public admin and defence; compul. soc. sec.	0.33	0.91	0.54	0.64	0.36	0.61
M	Education	0.44	0.57	-0.09	0.72	-0.09	-0.18
N	Health and social work	0.43	0.74	0.41	0.16	-0.31	0.22
O	Other community, social and personal services	0.29	0.91	0.47	-0.85	0.27	0.04
P	Private households with employed persons	0.29	0.00	0.47	0.00	0.27	-0.09

Source: EU KLEMS database, March 2007, wiiw calculations.

Table A.5.7

Contribution of skills to labour services and labour composition, 1995-2004

Code	Industry	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
Average annual growth rates of skills in labour services in per cent							
Total	Total economy	-0.43	1.23	-0.61	-0.84	0.28	1.21
A-B	Agriculture, hunting, forestry and fishing	-6.04	-3.62	0.35	-9.05	-4.07	-2.02
J-K	Finance, insurance, real estate and busin. serv.	1.80	5.85	5.04	3.17	2.90	3.60
L-P	Community, social and private services	0.29	0.93	0.70	-1.66	2.69	1.58
A	Agriculture, hunting and forestry	0.00	0.00	0.00	0.00	0.00	0.00
B	Fishing	0.00	0.00	0.00	0.00	0.00	0.00
C	Mining and quarrying	-8.11	-8.64	-6.49	-8.11	-8.08	-4.18
D	Total manufacturing	-0.43	0.60	-2.02	-1.19	-1.05	-0.63
E	Electricity, gas and water supply	-2.92	-4.39	-1.48	-0.88	-1.10	-2.31
F	Construction	-1.62	4.16	-3.38	-0.18	2.27	0.99
G	Wholesale and retail trade	-0.60	2.00	0.18	2.64	-0.34	0.94
H	Hotels and restaurants	1.48	2.61	0.36	-0.16	0.49	2.27
I	Transport and storage and communication	0.19	-0.57	-1.06	-2.05	0.81	1.04
J	Financial intermediation	1.14	0.80	1.26	2.20	3.10	0.53
K	Real estate, renting and business activities	1.93	7.91	6.35	3.35	2.83	4.47
L	Public admin and defence; compul. soc. sec.	0.34	2.02	3.23	-0.17	4.50	0.06
M	Education	0.28	0.11	1.72	-1.83	2.50	1.78
N	Health and social work	-0.44	2.18	-3.35	-1.86	1.40	1.83
O	Other community, social and personal services	1.37	-0.65	1.76	-3.25	2.19	2.45
P	Private households with employed persons	0.84	0.00	5.75	0.00	-1.03	2.59
Average annual growth rates of skills in labour composition							
Total	Total economy	0.40	0.68	-0.09	0.36	0.75	0.43
A-B	Agriculture, hunting, forestry and fishing	0.32	0.28	0.25	0.39	0.73	0.28
J-K	Finance, insurance, real estate and busin. serv.	0.31	0.78	0.67	0.60	0.19	0.38
L-P	Community, social and private services	0.30	0.55	0.52	0.35	0.30	0.39
A	Agriculture, hunting and forestry	0.00	0.00	0.00	0.00	0.00	0.00
B	Fishing	0.00	0.00	0.00	0.00	0.00	0.00
C	Mining and quarrying	0.34	0.59	0.45	0.31	0.18	0.34
D	Total manufacturing	0.24	0.36	0.46	0.19	0.40	0.34
E	Electricity, gas and water supply	0.34	0.59	0.45	0.31	0.18	0.24
F	Construction	0.26	0.42	0.26	0.27	0.40	0.12
G	Wholesale and retail trade	0.22	0.56	0.39	0.07	0.23	0.28
H	Hotels and restaurants	0.22	0.56	0.39	0.07	0.23	0.29
I	Transport and storage and communication	0.39	0.64	0.45	0.32	0.39	0.33
J	Financial intermediation	0.79	1.19	0.88	0.44	0.58	0.38
K	Real estate, renting and business activities	0.23	0.52	0.64	0.62	0.08	0.42
L	Public admin and defence; compul. soc. sec.	0.22	0.81	0.57	0.74	0.35	0.49
M	Education	0.45	0.34	0.10	0.74	0.09	0.26
N	Health and social work	0.29	0.70	0.36	0.12	0.16	0.20
O	Other community, social and personal services	0.26	0.83	0.73	-0.59	0.54	0.36
P	Private households with employed persons	0.26	0.00	0.73	0.00	0.54	0.37

Source: EU KLEMS database, March 2007, wiiw calculations.

Table A.5.8

Contribution of skills to labour composition change, 1995-2004 (as percentage of total labour composition change)

Code	Industry	Czech Republic	Hungary	Poland	Slovak Republic	Slovenia	EU-10
Contributions (in per cent)							
Total	Total economy	84.5	60.8	-13.3	67.0	107.6	190.8
A-B	Agriculture, hunting, forestry and fishing	89.6	85.2	78.9	73.0	102.2	54.3
J-K	Finance, insurance, real estate and busin. serv.	141.4	104.2	436.6	100.2	114.7	10754.5
L-P	Community, social and private services	79.4	62.4	53.0	68.5	230.4	653.4
A	Agriculture, hunting and forestry	0.0	0.0	0.0	0.0	0.0	0.0
B	Fishing	0.0	0.0	0.0	0.0	0.0	0.0
C	Mining and quarrying	73.1	61.8	99.4	59.7	71.0	-5267.7
D	Total manufacturing	61.3	69.8	89.8	128.3	81.6	71.5
E	Electricity, gas and water supply	73.1	61.8	99.4	59.7	71.0	165.5
F	Construction	66.9	76.0	67.5	92.4	87.4	60.4
G	Wholesale and retail trade	50.6	40.7	110.3	244.6	110.3	401.1
H	Hotels and restaurants	65.5	82.6	99.4	49.7	146.1	68.1
I	Transport and storage and communication	133.2	69.0	112.2	48.6	101.2	107.9
J	Financial intermediation	82.8	76.1	155.9	60.3	77.8	74.6
K	Real estate, renting and business activities	187.1	236.2	126.1	110.4	-99.5	128.0
L	Public admin and defence; compul. soc. sec.	66.5	89.4	105.1	115.4	96.9	80.4
M	Education	102.3	59.1	-105.8	102.8	-97.4	-146.2
N	Health and social work	66.4	94.5	87.2	73.1	-52.8	90.6
O	Other community, social and personal services	90.4	91.2	154.7	69.5	201.0	861.1
P	Private households with employed persons	90.4	0.0	154.7	0.0	201.0	-431.9

Source: EU KLEMS database, March 2007, wiiw calculations.

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