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Peter Havlik

Unit Labour Costs in the New EU Member States

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- introducing new data sets together with a discussion of their respective strengths and weaknesses (e.g. data sets for regional analysis, input-output tables, capital stock data, labour force surveys, etc.);
- statistical analysis of such data sets to demonstrate some of their potential uses;
- discussion of statistical methodological issues (such as in productivity analysis, comparisons of consumer expenditure structures across time and space, growth projections, etc.).

Peter Havlik is Deputy Director of wiiw.

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Peter Havlik

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New EU Member States**

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Abstract

Unit labour costs (ULCs) are one of the key economic variables considered in the context of globalization, competitiveness and production-location decisions. With the EU accession of eight Central and East European countries and their (almost) full inclusion in the European Single Market, the issues related to the labour cost competitiveness of these countries has become even more important. The present paper outlines the key methodological and practical problems associated with the evaluation of ULCs with a particular focus on the new EU member states (NMS). It provides also new and up-to-date internationally comparable ULC estimates for NMS at both the aggregate level (for the whole GDP) and in the manufacturing industry, as well as for its individual branches. A detailed statistical appendix contains indicators of macro-competitiveness for each NMS as well as data on productivity, labour costs and ULC estimates in the manufacturing industry.

Keywords: *competitiveness, labour costs, productivity, manufacturing, EU enlargement*

JEL classification: *C43, C82, E2, F49, J3*

Unit Labour Costs in the new EU member states

Introduction

One of the key economic variables considered in the context of globalization, outsourcing, competitiveness and the production location decisions (*Standortwettbewerb*) is the development and the level of labour costs (Brück et al., 2004). With the EU accession of eight Central and East European (mostly 'low-wage') countries on 1st May 2004 and their (almost) full inclusion in the European Single Market of goods and services, the issues related to the labour cost competitiveness of these countries (and their need for income catching-up) has become even more important.¹ Given the international capital mobility and increased FDI flows to the EU's new member states (as well as to other world regions – mainly to China), and sluggish economic growth in Western Europe with related labour market problems (especially in Germany), there have been concerns that the free movement of goods and capital, with simultaneous restrictions on the free movement of labour, will lead to a relocation of economic activities from high- to low-wage countries.

Survey results show that labour costs indeed vary enormously among the EU member countries. Even in Slovenia, which is a 'high-wage' country by NMS standards, the average monthly labour costs in industry and services (gross wages and salaries plus indirect labour costs, converted at current exchange rates) are below 40% of the German level. In Poland, which ranked second among the NMS in 2002, they reach only 22%, and at the low end, labour costs in the candidate countries Bulgaria and Romania hover at around 6% of the German level (Table 1). Labour cost differences among individual industries are substantial as well, yet there are only small differences in (relative) indirect labour costs (Eurostat, 2004a). Nominal (euro-based) labour costs in all NMS except Slovenia were growing faster than in the 'old' EU-15 during 1995-2002 (here the annual growth was less than 4% in this period – see Eurostat, 2004a and Appendix Table A/1), in the last couple of years frequently pushed up by currency appreciations. Although this can be considered a positive sign with regard to cohesion and catching-up, the rapid labour cost increases may put a strain on the NMS' international cost competitiveness – unless these are compensated by a corresponding rise in productivity, quality and other efficiency improvements.

¹ The Central and East European New EU Member States (NMS) are the Czech Republic (CZ), Hungary (HU), Poland (PL), Slovakia (SK), Slovenia (SI), Estonia (EE), Latvia (LV) and Lithuania (LT). In addition, we cover also the two candidate countries Bulgaria (BG) and Romania (RO).

Table 1

Monthly labour costs (LC) in industry and services, in EUR, 1996-2002

Country	1996	1997	1998	1999	2000	2001	2002	Share of wages and salaries in LC	
								in %	2002 ¹⁾
AT ²⁾	3030	.	.	.	.	.	3815	65.5	(-5.7)
CZ	426	446	491	519	582	661	770	70.0	(-2.6)
DK	.	3201	3444	3659	2944	3128	3922	87.4	(-3.3)
DE	3239	3221	3297	3411	3463	3521	3611	76.4	(-0.1)
EE	276	320	364	394	429	496	562	72.8	(-1.0)
EL	1446	1513	1500	1615	1658	1740	1849	78.1	(2.9)
ES ⁵⁾	2066	2028	2015	2027	2031	1867	1940	73.7	(-0.3)
FR	3136	3111	3112	3167	3274	3355	.	68.5 ³⁾	(1.1)
CY	1252	1352	1417	1460	1572	1634	1713	84.2	(-0.1)
LV	.	253	267	290	343	350	361	77.9	(0.5)
LT	192	260	302	334	392	.	.	72.1	(-2.5)
HU	434	476	494	523	568	640	.	70.0	(5.8)
PL	447	511	563	612	672	792	783	76.2 ⁴⁾	(15.1)
PT	1062	1086	1109	1157	1199	1250	1314	79.9	(4.3)
SI	1062	1139	1226	1289	1283	1338	.	80.6	(0.4)
SK	318	401	419	400	445	480	.	73.6	(2.2)
FI	2769	2776	2790	2923	3047	3217	3330	77.4	(1.9)
SE	3305	3400	3428	3635	4047	3885	4072	66.5	(-1.3)
UK	2169	2798	2980	3217	3677	3793	3891	82.0	(-1.0)
BG	.	.	.	.	179	190	194	70.2	.
RO	158	155	192	179	218	222	250	69.0	(-4.7)

Notes: 1) Change (in percentage points) of the share of wages and salaries in total labour costs between 1996 and 2002 (= decline). - 2) Estimated from annual gross wages and salaries in industry, including 13th and 14th salaries in direct labour costs. - 3) Year 2001. - 4) Year 2000. - 5) Methodological changes in Spain from 2001 onwards.

Source: Eurostat (2004a), Guger (2003) and wiiw Industrial Database.

Indeed, not only labour costs matter for international competitiveness but labour productivity plays an important role as well in shaping relative cost structures and hence the competitive position of individual countries, industries and firms. High labour costs (wages) are usually accompanied by high productivity and *vice versa*. A more appropriate indicator for the evaluation of international cost competitiveness are therefore unit labour costs (ULCs) – defined as labour costs per unit of output. Unfortunately, ULCs are much more difficult to measure, especially as far as ULC levels are concerned, and thus also seldom used. The present short paper briefly outlines the key methodological and practical problems related to the evaluation of ULC developments. Last but not least, it provides also new internationally comparable ULC estimates for NMS at both the aggregate level (for the whole GDP) and in the manufacturing industry, as well as for its individual branches.

Selected conceptual and measurement problems of ULCs

Unit labour costs (ULCs) are defined as labour costs (LCs) per unit of output (OUT).² As a ratio of two variables, they are thus affected by each of the two components. Labour costs ideally cover all costs related to the factor of labour, that means gross wages and salaries (including taxes) of employees plus all indirect labour costs borne by employers such as obligatory social contributions.³ Labour costs (per employee or employed person) can be measured per hour, month or per year. Obviously, each concept depends on the (actual or legally fixed) number of hours worked, on the statistical treatment of part-time and self-employed workers (that is on enterprise structure), etc.⁴ The analysis of the evolution of labour costs can focus on nominal (either in national currency or in euro) or real developments (nominal LCs deflated with either consumer price or producer price indices). Each indicator gives different results, has its own merits and can be used for different purposes (Havlik, 1996; Brück et al., 2004; Appendix Table A/1). Detailed labour costs survey data are now available for all NMS; these are regularly published also by Eurostat, the Statistical Office of the European Communities (see Table 1).

The concept of output may also vary: it can be gross domestic product (GDP, or gross value added) at the level of the whole economy, respectively, gross or net production (sales or a number of produced units – e.g. cars) at branch or company level. Each of the output concepts and definitions has measurement problems of its own. Theoretically, output can be also measured on an hourly or monthly basis, yet for practical purposes annual data are usually more reliable.⁵ For analytical purposes it is useful to relate labour costs (per employee or employed person) to (labour) productivity (LP), the latter defined as the ratio of (gross or net) output per employed person. Since productivity is a real variable, the output has to be measured in comparable (either over time or across countries) units used for aggregation. Again, different price deflators (consumer or producer prices, exchange rates or purchasing power parities) can be used for these purposes, each with its own merits (see Brück et al., 2004; Oulton, 1994; and Monnikhof and van Ark, 2002 for more details).

² See Hinze et al. (1998) and Oulton (1994) for more details.

³ The proportion of indirect labour costs in the total varies among countries (Table 1) since it depends *inter alia* on the financing of each country's social system and taxation rules. The proportion is fairly constant over time (with the notable exceptions of Austria, Hungary and Poland). In the case of Austria, there is a specific problem how to treat the (obligatory) 13th and 14th salaries (we have included them in the direct wage costs – see Pollan, 1997; Guger, 2003). This is one of the reasons why data for Austria are not included in Eurostat LC surveys.

⁴ The lower number of hours worked has been one of the main reasons for the lower West European (annual) labour productivity compared to the USA – see O'Mahony and van Ark, 2003; Blanchard, 2004.

⁵ In the context of ULC measurement, this implies that labour costs have to be expressed on an annual basis as well.

Box 1

Definition of Unit Labour Costs (ULCs)

Assuming that individual ULC components are defined on a comparable basis (in time and across countries/industries, respectively, or both), ULCs can be defined as follows:

$$ULC = LC / LP$$

where LC are labour costs (per employed person) and the labour productivity (LP) is defined as real output per employed person:

$$LP = OUT / EMP$$

Thus, unit labour costs can be rewritten:

$$ULC = LC/LP = LC / (OUT / EMP) \quad (1)$$

Accordingly, any change (Δ) in unit labour costs (ΔULC) can be decomposed in the following way (time or country subscripts are omitted):

$$\Delta ULC = \Delta LC - \Delta LP = \Delta LC - \Delta OUT + \Delta EMP \quad (2)$$

ULC will rise (that is, cost competitiveness will decline) when the labour cost increase is higher than the corresponding increase in productivity and *vice versa*. In turn, productivity changes are determined by the relative growth rates of output and employment: For instance, LP will increase if (real) output growth is faster than employment growth. And with given labour costs, this will lower ULC and increase the cost competitiveness of the respective country or industry. Formula (2) is basically valid for comparisons in both time (ULC growth rates) and across countries (ULC levels).⁶ In practice, it is much easier to compare growth rates rather than levels since the available statistical data tend to be more consistent over time within each country.⁷ In international ULC comparisons over time, the 'national' ULC in formula (2) are frequently adjusted for the relative movements of exchange rates (ER). Labour costs in national currency are therefore converted into euro (at current exchange rates) and fluctuations of exchange rates have an impact on ULC as well.⁸

The effects of the key individual components on the development of ULCs in Austria and selected NMS are illustrated in Figure 1. Note that in most NMS, changes in ULCs are determined by the growth of labour costs (here approximated by nominal gross wages in national currency) and exchange rate movements. The contribution of productivity (an increase in productivity reduces ULC growth) has been much less pronounced (with the exception of Slovakia and the Czech Republic in the year 2000).⁹ Compared to Austria,

⁶ Changes in time (Δ) can be replaced by differences among countries.

⁷ The NMS have witnessed sweeping changes in their statistical reporting methodology during recent years and the time consistency of their data is thus often problematic in comparisons over time as well.

⁸ Currency appreciation will push up labour costs expressed in euro and thus ULCs as well; currency depreciation ('competitive devaluation') will lower labour costs in euro and thus reduce ULCs of the respective country. Alternatively, if one is interested in the (domestic) purchasing power of wages, PPPs can be used for the conversion of LC instead of ER.

⁹ In the majority of NMS, the recent productivity growth has been associated with declining employment, especially in the manufacturing industry (exceptions are Hungary, Slovenia and Latvia – see Appendix Table A/1).

ULC developments in NMS have been much more volatile; there has been no exchange rate (EUR) effect in Austria after the establishment of the EMU since 1999 (note that graphs in Figure 1 have different scales).¹⁰

International comparisons of ULC levels pose even greater challenges not only because the national definitions of the individual variables usually differ – despite substantial efforts devoted to the establishment of uniform standards, e.g. by UN, OECD or Eurostat. The main problem are proper international comparisons of output and productivity levels. These are hampered by the conceptually difficult conversion of output (or productivity) data from the national currency (at constant prices or ‘real’ values) to common units. The use of market exchange rates for this purpose is not appropriate (especially for NMS, mainly due to their still grossly undervalued currencies and fluctuating exchange rates).¹¹ Alternative proxy converters suitable for international comparisons of real output (or productivity) are either purchasing power parities (PPPs) for aggregate GDP, or – at industry level – branch-specific unit value ratios (UVRs) which compare prices of representative industrial products (see Oulton, 1994; Monnikhof and van Ark, 2002; Eurostat, 2002 for more detailed argumentation).

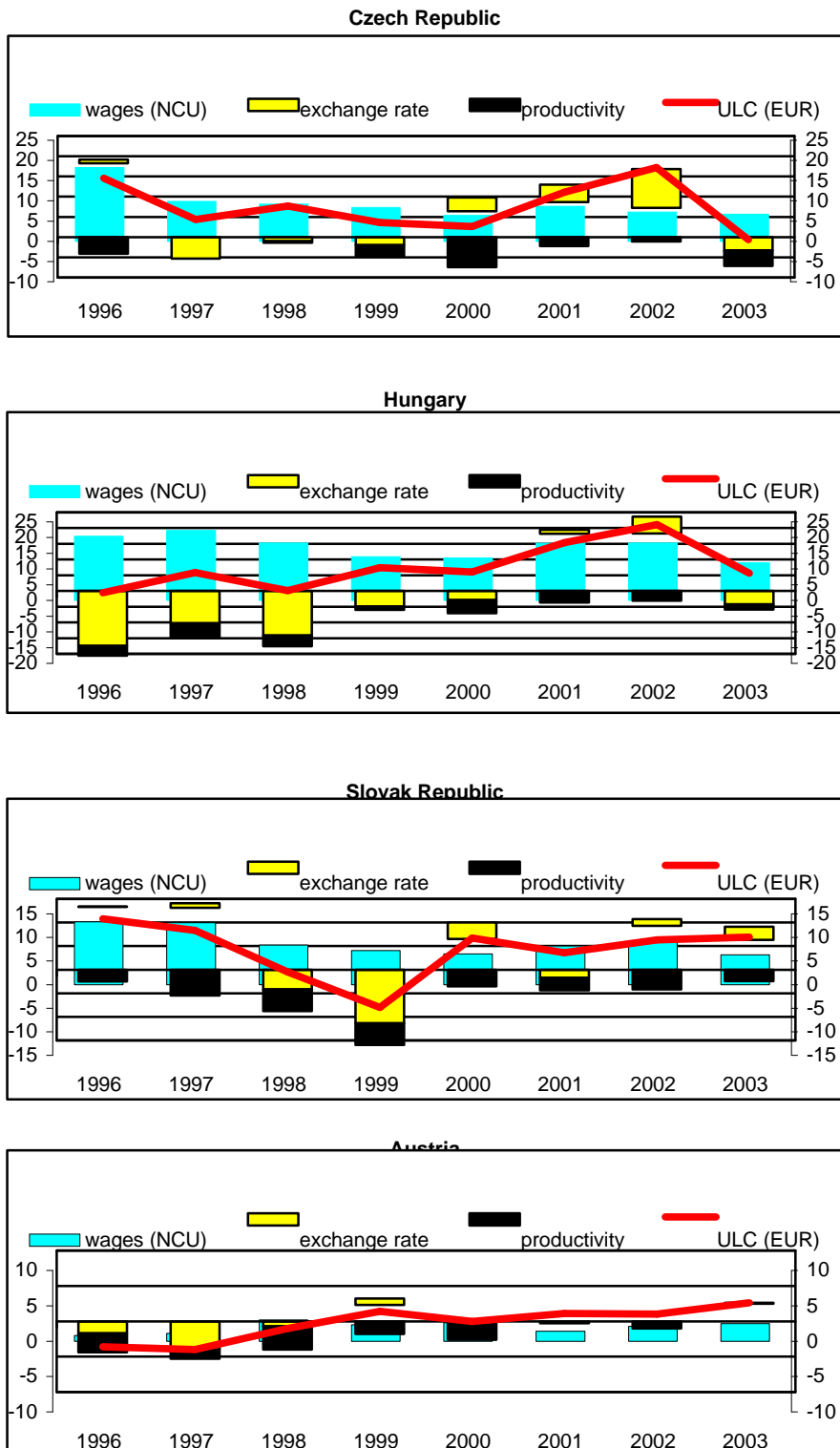
A consistent simultaneous international comparison in both time (ULC growth rates) and across countries (ULC levels) is virtually impossible owing to well-known index number problems, and compromise approximate solutions have to be found (Krijnse Locker and Faerber, 1984; Eurostat, 2004b). Last but not least, one has to mention an important conceptual problem related specifically to the definition and interpretation of ULCs. As mentioned above, there is a number of theoretical possibilities regarding the measurement of individual ULC components, depending not only on data availability but on the purpose of the analysis as well (see Brück et al., 2004; Oulton, 1994). If we are using ULCs for an assessment of the international competitive cost position of countries or industries, it is plausible to express labour costs in international currency (e.g. euro) using the official exchange rate conversion (this allows for a direct comparison of labour costs across countries). And since we have to relate labour costs to productivity (the latter reflecting real output per unit of labour), we have to evaluate productivity at constant and comparable international prices. As argued above, in order to obtain internationally comparable real output (or productivity) levels we have to convert national productivity data (e.g. GDP per

¹⁰ For instance, the picture would be quite different if we used USD LC values instead.

¹¹ The frequently made assumption that the ‘purchasing power parity theorem holds’ (see e.g. Konings, 2004) cannot be maintained – especially for NMS. Judged by the so-called Exchange Rate Deviation Index (ERDI – a ratio of market exchange rate and PPPs) the currencies in most NMS are still grossly undervalued – see Appendix Table A/1. More details on the limitations related to the use of ER and PPPs can be found in Eurostat (2004b).

Figure 1

**Aggregate ULCs (at GDP level): annual changes in %
and contribution of ULC components in selected NMS and Austria**



Source: Own calculations based on Appendix Tables A/1 and A/2.

employed person) to international currency units with specific conversion factors (usually PPPs) and not with market exchange rates.¹²

ULC estimates at aggregate (GDP) and manufacturing industry levels

The relative movements of labour costs (wage rates) and productivity determine the evolution of unit labour costs. ULC developments at the level of whole GDP in all NMS and in Austria are shown in Figure 2 (detailed data can be found in Appendix Tables A/1 and A/2).¹³ In all NMS, aggregate ULCs have been growing rapidly during the past couple of years; ULC growth has been most pronounced in Lithuania, the Czech Republic and Hungary. Poland's ULCs declined sharply after 2001, largely thanks to the zloty's depreciation against the euro. Slovenia (with the highest labour costs among the NMS) recorded only modest ULC growth. Compared to Austria, the relative competitive cost position of all NMS has thus substantially deteriorated during the past few years since Austrian ULCs have remained fairly constant during this period. Nevertheless, all NMS still maintain a considerable competitive costs advantage owing to their low ULC levels. Despite recent increases, the estimated aggregate ULCs were still only 30% to 45% of the Austrian level in 2003 (and 60% of the Austrian level in Slovenia – see Figure 3).¹⁴ Obviously, an extension of working time by a few hours per month, even without any wage compensation (and the assumed proportional increase in labour productivity) would not eliminate the huge competitive labour cost advantages of the NMS.

In the manufacturing industry, the growth of ULCs has been much less pronounced in the NMS (except Lithuania – see Figure 4). Still, over the period 1995-2003, manufacturing ULCs increased by nearly 30% in the Czech Republic and in Slovenia. In Slovakia, ULCs in manufacturing remained more or less stable; in Poland they declined by almost 20%. When analysing the factors (components) behind the changes in ULCs, one can again show that wage increases (in national currency units, NCU) were the major factor driving ULC changes in most NMS, at least until about 1998. Only occasionally were wage increases 'neutralized' by strong currency depreciations – for instance in Hungary and in

¹² As far as productivity levels in manufacturing industry are concerned, neither market exchange rate nor PPP conversions are fully appropriate and we have to use proxy UVR conversion factors (e.g. partial PPPs for gross fixed capital formation) instead – see below.

¹³ ULCs have been calculated according to formula (2). LC are approximated by gross wages and salaries (in euro, converted with current exchange rates), LP by GDP (at constant prices of 1999) per employed person. The approximation of LC by gross wages does not change the dynamic picture substantially (except for Poland where the ULC increase would be less steep after 1999 owing to the decreasing share of indirect labour costs in the total – see Table 1).

¹⁴ ULC levels have been calculated according to formula (2). LC are approximated by gross wages and salaries (in euro, converted with current exchange rates), LP by GDP (at constant prices of 1999, converted from national currency with benchmark PPPs for 1999) per employed person. The approximation of LC by gross wages tends to increase NMS' ULC gaps relative to Austria owing to the higher share of indirect labour costs in that country – see Table 1).

Figure 2

**Aggregate ULCs (at GDP level), EUR-adjusted
1995 = 100**

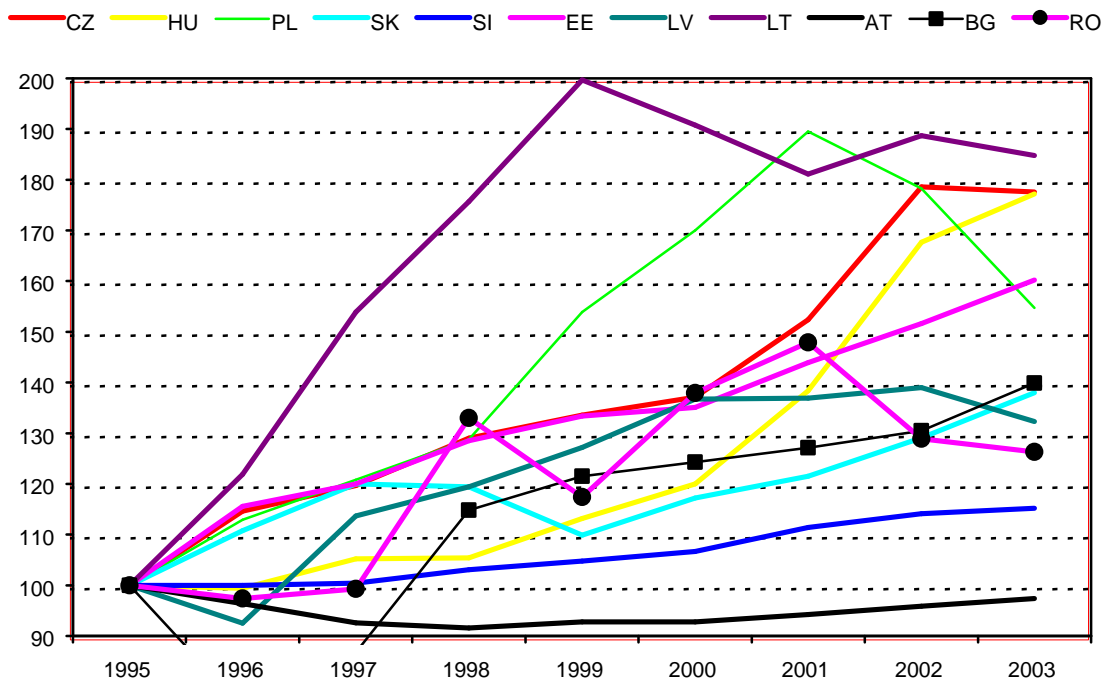


Figure 3

**International comparison of aggregate ULCs (at GDP level)
Austria = 100**

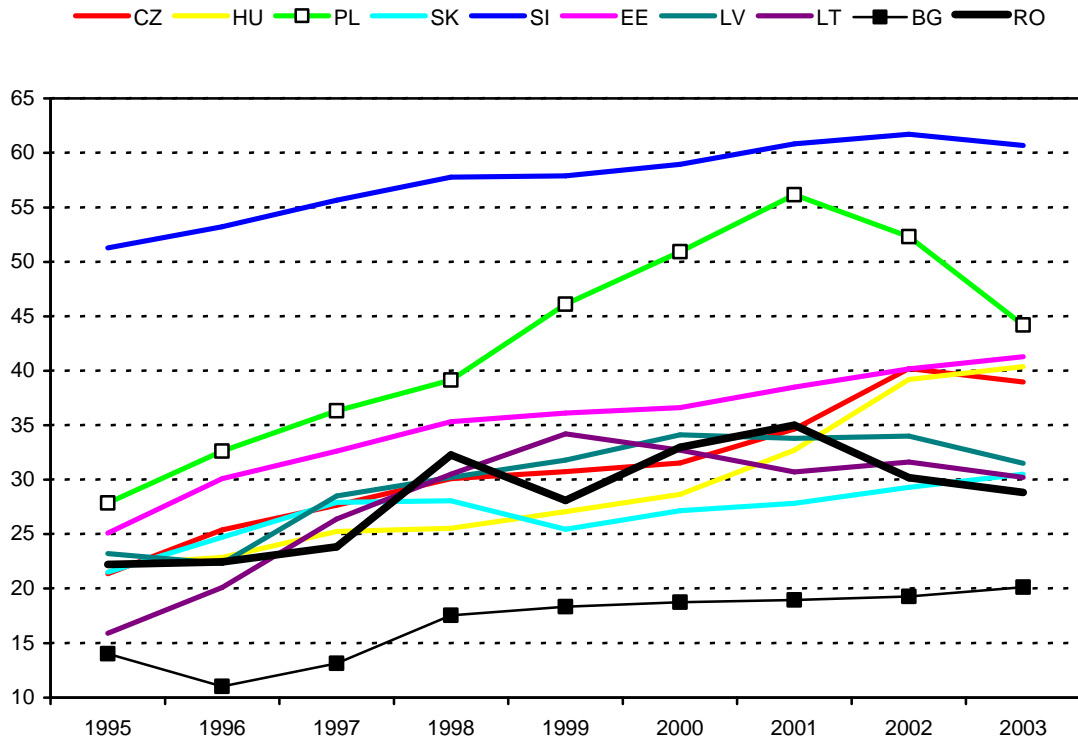
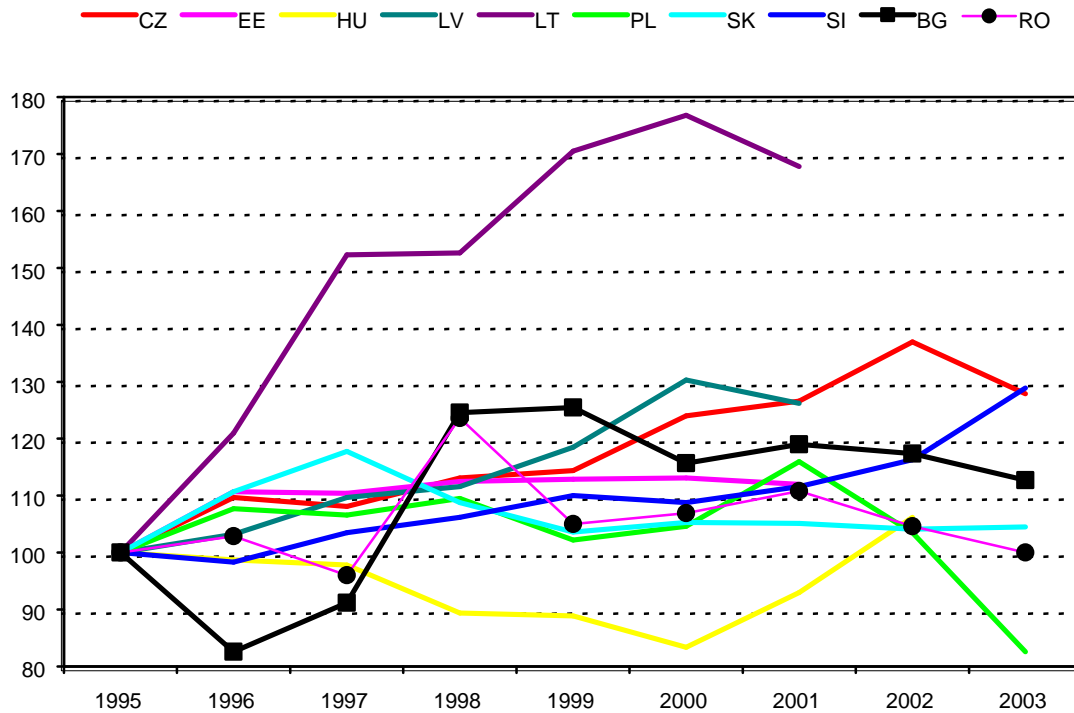


Figure 4

**Development of manufacturing-industry ULCs in NMS, EUR-adjusted
1995 = 100**



Source: Own calculations based on wiiw Industrial Database.

Slovakia (1995-1998) and in Poland after 2002. In the past few years, wage increases in local currency were modest in most NMS, but currency appreciation has pushed up labour costs in euro terms. The effect of productivity gains as a counterbalance to rising labour costs has gained in importance over the years (with the exception of 2001 when the worldwide recession hit also the NMS). In most countries, productivity gains in the manufacturing industry were associated with declining employment (except in Hungary, and recently also in Slovakia).

In Austria, WIFO estimates indicate that manufacturing industry ULCs declined by 2.2% per year on average during 1995-2002, thus improving the competitive cost position of Austrian manufacturing during this period relative to the majority of its trading partners, including the NMS (see Guger, 2003).

Sectoral differences in ULC changes are mainly determined by the varying dynamics of labour productivity in individual branches (as already mentioned, changes in wage rates differ much less across industries; the exchange rate movements are, of course, the same for all industries in one country). Therefore, we may expect that the industries identified as

'productivity winners' will show either a lower increase or a faster decline of ULCs than total manufacturing, i.e. a better than average cost competitive performance. 'Productivity loser' branches, on the other hand, will probably show either a stronger increase or a smaller decline of ULCs than the manufacturing average, pointing to a weaker competitive cost performance. This is confirmed in Appendix Table A/3 where relative productivity growth in individual industries (relative to total manufacturing over the period 1995-2002) is presented. Better than average productivity performance is usually observed in the technologically more sophisticated industries such as electrical & optical equipment, the transport equipment industry, but also manufacturing n.e.c. (mainly furniture). Industries signalling a weaker competitive performance in most NMS are mainly the 'productivity losers': the food & beverages industry, textiles & clothing, leather & leather products, wood products, paper & printing, coke & petroleum products and chemicals.¹⁵

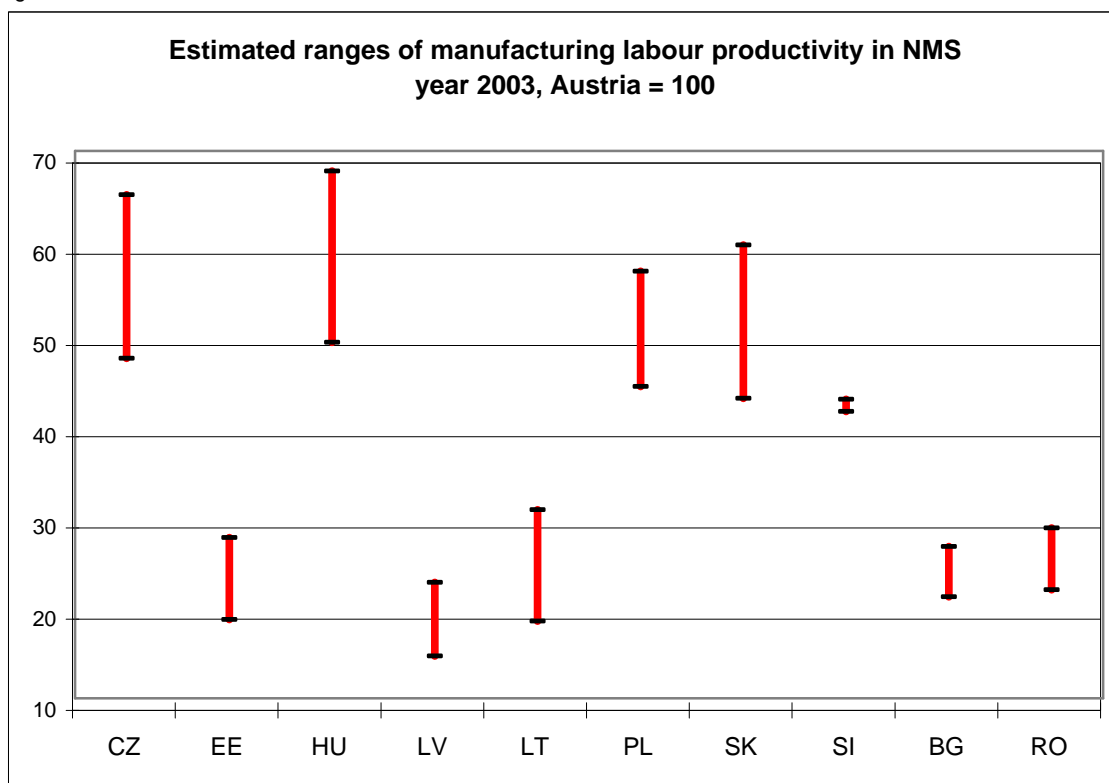
As mentioned above, productivity level comparisons in the manufacturing industry would require special price conversions (unit value ratios – UVRs) for translating data in national currencies into common units. However, UVR estimates for the manufacturing industry and its individual branches are available only for three NMS (the Czech Republic, Hungary and Poland relative to Germany in 1996).¹⁶ Appendix Figure A/1 shows approximate UVR-based productivity comparisons of these three NMS with Austria; the year 2002 was obtained after extrapolation from the 1996 UVR-based benchmarks with country- and branch-specific rates of productivity growth. The results indicate that Hungarian manufacturing productivity reached close to half of the Austrian level by the year 2002; the productivity gap narrowed by nearly 10 percentage points as against 1996. In Poland, the narrowing of the gap was even faster, whereas the productivity gap of Czech manufacturing relative to Austria declined by less than 2 percentage points. A closer look at the performance of individual branches shows that relatively smaller productivity gaps (and impressive productivity catching-up) were observed especially in the manufacturing of rubber and plastics, electrical, optical equipment and transport equipment, but virtually no productivity catching-up occurred in other branches. Hungary's labour productivity in the transport equipment industry, and Poland's productivity in rubber and plastics is apparently higher than in Austria. On the other hand, NMS' productivity gaps in food & beverages, leather and wood products have even widened relative to Austria since 1996 (see Appendix Table A/3 for changes in manufacturing labour productivity in individual branches).

¹⁵ Needless to say, we discuss here only labour productivity. Different rates of capital accumulation could account for some of the difference.

¹⁶ The estimated UVR-based Hungarian manufacturing industry labour productivity was slightly less than 40% of the German level in 1996, the respective Czech-German productivity relation was 35%, the Polish-German productivity relation was 25%, all with fairly large sectoral differences – see Monnikhof and van Ark (2002).

Owing to the lack of UVR estimates for all NMS, productivity data in national currencies are converted by wiiw with both purchasing power parities for GDP (PPP99 for GDP) and with partial PPPs for gross fixed capital formation (PPPCAP99).¹⁷ Figure 5 shows the estimated ranges of manufacturing labour productivity (gross production per employee) compared to Austria. The upper range presented in Figure 5 results from national productivity figures converted with purchasing power parities for the whole GDP. This conversion leads to higher productivity estimates for the NMS. The lower range uses as a conversion factor partial PPPs for gross fixed capital formation (PPPCAP99) where the price levels in the NMS are relatively high (presumably due to imports of machinery and equipment). This conversion thus leads to lower productivity estimates. Given the closer correspondence of the latter productivity estimates to the theoretically superior UVR-based productivity data for the Czech Republic, Hungary and Poland (see Appendix Figure A/1), and assuming that a similar correspondence between UVRs and PPPCAP exists for other NMS as well, one can assume that the lower range of productivity levels shown in Figure 5 is probably closer to reality – at least for the manufacturing industry as a whole.

Figure 5

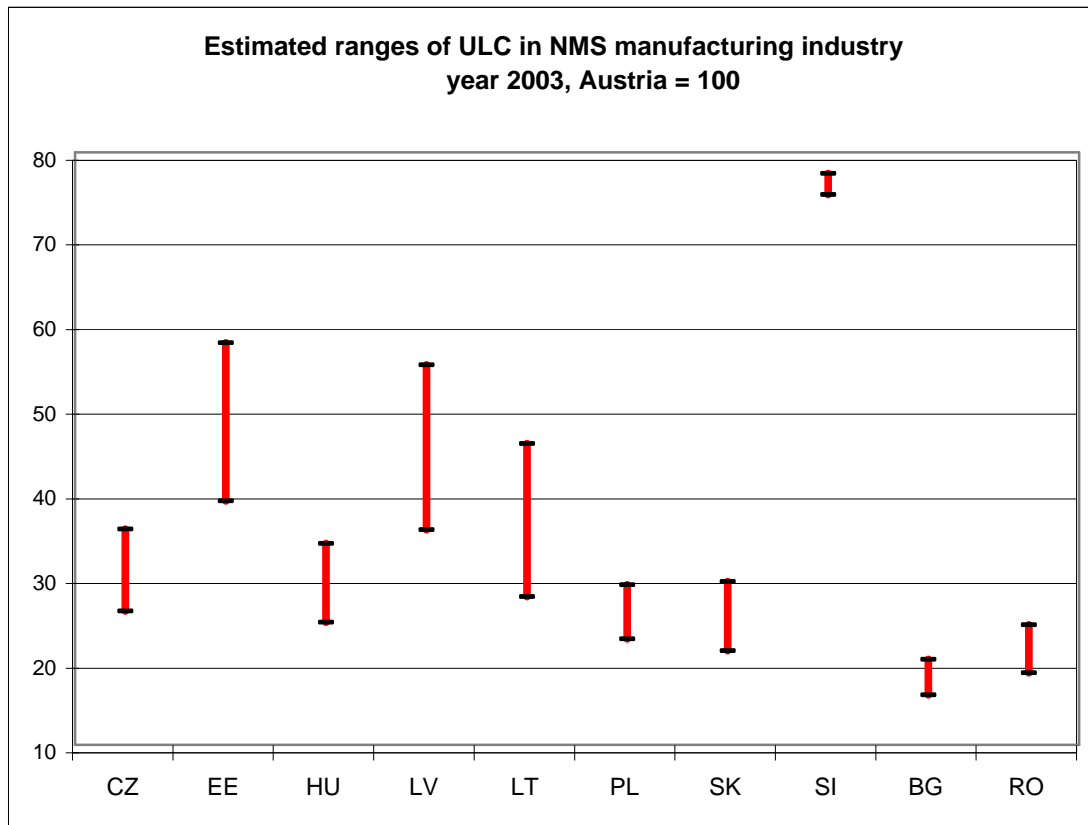


Source: Own estimates based on wiiw Industrial Database and Eurostat (see Appendix Table A/5).

¹⁷ PPPs were adopted from the ECP 1999 – see Eurostat (2001).

With respect to labour costs in manufacturing industry and in individual NACE branches one can observe the following pattern: First, the labour cost gaps (Table A/4) are much more even across sectors than is the case with productivity (Table A/5). Second, and this is a very important point for the comparative cost dynamics, the growth rates of wages (closure of wage gaps) are much more similar across sectors than is the case for the (differential) productivity increases. Last but not least, NMS' labour cost gaps (relative to Austria or the EU-15) are much bigger than gaps in estimated labour productivity, implying lower unit labour costs in the NMS.

Figure 6



Source: Own estimates based on wiiw Industrial Database and Eurostat (see Appendix Table A/6).

Cross-country ULC level comparisons are hampered by the same problems as the above-discussed productivity comparisons. Figure 6 (and Appendix Table A/6) provide two sets of ULC data based on the above-shown alternative productivity estimates relative to Austria.¹⁸ Even the upper boundary of ULCs (Appendix Table A/6) indicates considerable competitive (cost) advantage of NMS' manufacturing. The lowest ULCs were observed in

¹⁸ PPPCAP99-based ULC estimates in Appendix Table A/6 are closer to reality for reasons discussed above. Because of delayed data for many EU countries and problems of consistency especially at the level of individual industries, we use here Austria as a reference country.

Poland and in the Slovak Republic, due to their comparatively high labour productivity, and in Bulgaria and Romania, because of their extremely low labour costs. The Baltic states have high ULCs as relatively low labour costs are combined with even lower productivity, while the Czech Republic and Hungary are characterized by both relatively high labour costs and high productivity resulting in manufacturing ULCs of about one third of the Austrian level in 2003. ULCs in Slovenia are rather high (nearly 80% of the Austrian level) owing to high labour costs and relatively low productivity. Keeping in mind that estimates are less reliable, Appendix Table A/6 suggests that sectoral ULC variations are considerable again; in some branches (leather products in Hungary and Slovenia; textiles & clothing and wood products in Slovenia) there is obviously no comparative ULC advantage in NMS any more. On the other hand, in the electrical and optical, as well as transport equipment industries (all favoured targets of FDI), NMS' unit labour costs are very low – especially in the Slovak Republic and in Hungary.

References

- Barrel, R. and D. T. te Velde (2000), 'Catching-up of East German Labour Productivity in the 1990s', *German Economic Review*, Vol. 1, No. 3, August, pp. 271-297.
- Blanchard, O. (2004), 'The economic future of Europe', *NBER Working Paper* No.10310, National Bureau of Economic Research, Cambridge, MA, March.
- Brück, T., A. Uhlendorf and M. Wowereis (2004), 'Lohnkosten im internationalen Vergleich', *DIW Wochenbericht*, 14/2004, April, pp. 161-169.
- European Commission (2003), 'European competitiveness report 2003', Commission staff working document, Luxembourg.
- Eurostat (2001), 'The European Comparison Programme: Aggregate-level results for 1999', Luxembourg, September.
- Eurostat (2003), 'Labour Costs Survey 2000', *Statistics in focus*, Theme 3 – 7/2003, Luxembourg.
- Eurostat (2004a), 'Labour Costs in Europe 1996-2002', *Statistics in focus*, Theme 3 – 9/2004, Luxembourg.
- Eurostat (2004b), 'GDP per capita in Purchasing Power Standards for EU, Candidate Countries and EFTA. Nowcast 2003', *Statistics in focus*, Economy and Finance, 27/2004, Luxembourg.
- Guger, A. (2003), 'Internationale Lohnstückkostenposition 2002 geringfügig verbessert', *WIFO Monatsberichte* 9/2003, pp. 683-692.
- Guger, A. (2004), 'Internationale Lohnstückkostenposition 2003 wechselkursbedingt verschlechtert', *WIFO Monatsberichte* 9/2004, pp. 679-687.
- Havlik, P. (1996), 'Exchange Rates, Competitiveness and Labour Costs in Central and Eastern Europe', *wiiw Research Reports*, No. 231, The Vienna Institute for International Economic Studies (wiiw), Vienna, October.
- Havlik, P. (2003a), 'Restructuring of Manufacturing Industry in the Central and East European Countries', *Prague Economic Papers*, No. 1, pp. 18-35.
- Havlik, P. (2003b), 'CEE Industry in an Enlarged EU: Restructuring, Specialization and Competitiveness', in S. Richter (ed.), 'The Accession Treaty and Consequences for New EU Members', *wiiw Current Analyses and Country Profiles*, No. 18, The Vienna Institute for International Economic Studies (wiiw), Vienna, April, pp. 23-33.
- Havlik, P. and W. Urban (2003), 'Industrial Development', in M. Landesmann (ed.), *wiiw Structural Report 2003 on Central and Eastern Europe*. Vol. 1, The Vienna Institute for International Economic Studies (wiiw), Vienna, October, pp. 27-68.
- Hinze, J., C. Brück, R. F. Danckwerts and E. Wohlers (1998), *Aussagefähigkeit internationaler Arbeitskostenvergleiche. Methodische Grundlagen, empirische Ergebnisse und wirtschaftspolitische Schlußfolgerungen*, HWWA Studies No. 42, Hamburg Institute of International Economics (HWWA), Hamburg.
- Krijnse Locker, H. and H. D. Faerber (1984), 'Space and Time Comparisons of Purchasing Power Parities and Real Values'. *The Review of Income and Wealth*, No. 1, March.
- Konings, J. (2004), 'The employment effects of foreign direct investments', *EIB Papers*, Vol. 9, No. 1, European Investment Bank (EIB), Luxembourg, pp. 86-109.
- Monnikhof, E. and B. van Ark (2002), 'New estimates of labour productivity in the manufacturing sectors of the Czech Republic, Hungary and Poland, 1996', Groningen Growth and Development Centre, University of Groningen & The Conference Board, January.
- O'Mahony, M. and B. van Ark (2003), 'EU productivity and competitiveness: An industry perspective. Can Europe resume the catching-up process?', European Communities, Luxembourg.

- Oulton, N. (1994), 'Labour productivity and unit labour costs in manufacturing: the UK and its competitors', *National Institute Economic Review*, United Kingdom, May, pp. 49-60.
- Pollan, W. (1997), 'Grosse Lohnunterschiede nach Branchen in der Industrie', *WIFO Monatsberichte* 3/1997, pp. 171-178.
- Taieb, H. S. (1995), 'Labour Costs in a set of Central and Western European Countries. Some Comparative Remarks', *ILO-CEET Report*, Budapest, February.
- wiiw (2001), 'Competitiveness of Industry in CEE Candidate Countries', Report to the European Commission, DG Enterprise, Final Report, July 2001; available on the EU DG Enterprise Website and at www.wiiw.ac.at/e-publications.html
- wiiw (2003), *Countries in Transition. wiiw Handbook of Statistics*, The Vienna Institute for International Economic Studies (wiiw), Vienna.
- Wöfl, A. (2004), 'Productivity Growth in Services Industries: Is There a Role for Measurement?', *International Productivity Monitor*, No. 8, Spring, pp. 66-80.
- Zuckerstätter, J. (2004), 'Konvergenz von Löhnen und Preisen zwischen den mittel- und osteuropäischen Ländern sowie Österreich', *Wirtschaft und Gesellschaft*, 2/2004, pp. 197-215.

Appendix

Table A/1

Indicators of macro-competitiveness, 1996-2003

EUR-based, annual averages

	1996	1997	1998	1999	2000	2001	2002	2003 prelim.
Czech Republic								
Exchange rate (ER), CZK/EUR	34.01	35.80	36.16	36.88	35.61	34.08	30.81	31.84
PPP, CZK/EUR	12.64	13.31	14.47	14.57	15.47	16.06	15.86	16.11
ERDI (EUR based)	2.69	2.69	2.50	2.53	2.30	2.12	1.94	1.98
Average monthly gross wages, CZK	9825	10802	11801	12797	13614	14793	15857	16917
Average monthly gross wages, EUR (ER)	289	302	326	347	382	434	515	531
Average monthly gross wages, EUR (PPP)	777	812	815	878	880	921	1000	1050
GDP per empl. person, CZK at 1999 pr.	387489	387428	388931	399297	428683	437917	442910	459802
Unit labour costs, 1989=100	263.3	289.5	315.1	332.8	329.8	350.8	371.8	382.0
Unit labour costs, ER adj., 1989=100	128.5	134.2	144.6	149.8	153.7	170.8	200.3	199.1
Unit labour costs, PPP adj., Austria=100	25.40	27.64	30.09	30.73	31.53	34.65	40.22	38.97
Hungary								
Exchange rate (ER), HUF/EUR	191.15	210.93	240.98	252.80	260.04	256.68	242.97	253.51
PPP, HUF/EUR	80.52	92.93	102.93	109.11	116.74	121.28	128.33	134.09
ERDI (EUR based)	2.37	2.27	2.34	2.32	2.23	2.12	1.89	1.89
Average monthly gross wages, HUF	46837	57270	67764	77187	87645	103553	122482	137187
Average monthly gross wages, EUR (ER)	245	272	281	305	337	403	504	541
Average monthly gross wages, EUR (PPP)	582	616	658	707	751	854	954	1023
GDP per empl. person, HUF at 1999 pr.	2732562	2859956	2957830	2989243	3113419	3229667	3331319	3383380
Unit labour costs, 1989=100	326.7	381.7	436.7	492.2	536.6	611.2	700.8	772.9
Unit labour costs, ER adj., 1989=100	111.2	117.8	117.9	126.7	134.3	154.9	187.7	198.4
Unit labour costs, PPP adj., Austria=100	22.87	25.23	25.53	27.05	28.66	32.71	39.22	40.40
Poland								
Exchange rate (ER), PLN/EUR	3.377	3.706	3.923	4.227	4.011	3.669	3.856	4.398
PPP, PLN/EUR	1.4960	1.6601	1.8209	1.8933	1.9792	2.0352	2.0371	2.0558
ERDI (EUR based)	2.26	2.23	2.15	2.23	2.03	1.80	1.89	2.14
Average monthly gross wages, PLN ^{*)}	874	1066	1233	1697	1894	2045	2098	2201
Average monthly gross wages, EUR (ER)	259	288	314	401	472	557	544	501
Average monthly gross wages, EUR (PPP)	584	642	677	896	957	1005	1030	1071
GDP per empl. person, PLN at 1999 pr.	35146	36520	37398	40011	42599	45105	46795	49619
Unit labour costs, 1989=100	3619.4	4246.1	4795.7	6171.4	6468.1	6596.9	6522.7	6455.4
Unit labour costs, ER adj., 1989=100	170.9	182.7	194.9	232.8	257.1	286.7	269.7	234.0
Unit labour costs, PPP adj., Austria=100	32.60	36.32	39.15	46.11	50.92	56.16	52.30	44.22
Slovak Republic								
Exchange rate (ER), SKK/EUR	38.40	38.01	39.60	44.12	42.59	43.31	42.70	41.49
PPP, SKK/EUR	15.26	15.86	16.41	17.08	17.45	17.91	17.99	18.95
ERDI (EUR based)	2.52	2.40	2.41	2.58	2.44	2.42	2.37	2.19
Average monthly gross wages, SKK	8154	9226	10003	10728	11430	12365	13511	14365
Average monthly gross wages, EUR (ER)	212	243	253	243	268	286	316	346
Average monthly gross wages, EUR (PPP)	534	582	610	628	655	690	751	758
GDP per empl. person, SKK at 1999 pr.	343027	361950	378496	395905	409615	420561	438387	448747
Unit labour costs, 1989=100	234.9	251.9	261.2	267.8	275.8	290.6	304.6	316.4
Unit labour costs, ER adj., 1989=100	101.5	110.0	109.5	100.8	107.5	111.4	118.4	126.6
Unit labour costs, PPP adj., Austria=100	24.72	27.90	28.06	25.46	27.15	27.82	29.29	30.50
Slovenia								
Exchange rate (ER), SIT/EUR	169.51	180.40	186.27	193.63	205.03	217.19	226.22	233.70
PPP, SIT/EUR	117.22	124.21	131.47	136.17	141.02	150.19	159.28	163.87
ERDI (EUR based)	1.45	1.45	1.42	1.42	1.45	1.45	1.42	1.43
Average monthly gross wages, SIT	129125	144251	158069	173245	191669	214561	235436	253200
Average monthly gross wages, EUR (ER)	762	800	849	895	935	988	1041	1083
Average monthly gross wages, EUR (PPP)	1102	1161	1202	1272	1359	1429	1478	1545
GDP per empl. person, SIT at 1999 pr.	4556455	4764211	4923931	5108573	5240840	5306981	5456408	5626915
Unit labour costs, 1989=100	4976.3	5316.8	5637.1	5955.0	6422.0	7099.4	7576.8	7901.6
Unit labour costs, ER adj., 1989=100	94.7	95.1	97.6	99.2	101.1	105.5	108.1	109.1
Unit labour costs, PPP adj., Austria=100	53.22	55.67	57.77	57.89	58.94	60.83	61.70	60.69

*) Poland: Methodological change in 1999 (broader wage coverage).

Table A/1 (ctd.)

	1996	1997	1998	1999	2000	2001	2002	2003
								prelim.
Estonia								
Exchange rate (ER), EEK/EUR	15.074	15.670	15.783	15.647	15.647	15.647	15.647	15.647
PPP, EEK/EUR	6.179	6.699	7.230	7.384	7.513	7.960	8.230	8.561
ERDI (EUR based)	2.44	2.34	2.18	2.12	2.08	1.97	1.90	1.83
Average monthly gross wages, EEK	2985	3573	4125	4440	4907	5510	6144	6723
Average monthly gross wages, EUR (ER)	198	228	261	284	314	352	393	430
Average monthly gross wages, EUR (PPP)	483	533	571	601	653	692	747	785
GDP per empl. person, EEK at 1999 pr.	113458	125825	134713	140928	153732	162089	171516	177669
Unit labour costs, 1992=100	451.1	486.9	525.0	540.1	547.2	582.8	614.1	648.8
Unit labour costs, ER adj., 1992=100	476.0	494.2	529.1	549.1	556.4	592.5	624.4	659.6
Unit labour costs, PPP adj., Austria=100	30.13	32.59	35.26	36.08	36.55	38.50	40.16	41.34
Latvia								
Exchange rate (ER), LVL/EUR	0.6900	0.6574	0.6614	0.6237	0.5600	0.5627	0.5826	0.6449
PPP, LVL/EUR	0.2275	0.2382	0.2457	0.2529	0.2567	0.2623	0.2650	0.2728
ERDI (EUR based)	3.03	2.76	2.69	2.47	2.18	2.15	2.20	2.36
Average monthly gross wages, LVL	99	120	133	141	150	159	173	192
Average monthly gross wages, EUR (ER)	143	183	202	226	267	283	297	298
Average monthly gross wages, EUR (PPP)	434	504	543	557	583	606	653	706
GDP per empl. person, LVL at 1999 pr.	3800	3945	4148	4364	4798	5070	5249	5540
Unit labour costs, 1992=100	344.7	403.7	426.4	428.7	413.5	416.1	437.3	461.0
Unit labour costs, ER adj., 1992=100	433.6	533.1	559.6	596.6	640.9	641.9	651.5	620.5
Unit labour costs, PPP adj., Austria=100	22.26	28.51	30.25	31.80	34.15	33.83	33.99	31.54
Lithuania								
Exchange rate (ER), LTL/EUR	5.0118	4.5272	4.4924	4.2712	3.6990	3.5849	3.4605	3.4528
PPP, LTL/EUR	1.4728	1.6382	1.6973	1.6534	1.6048	1.5700	1.5545	1.5218
ERDI (EUR based)	3.40	2.76	2.65	2.58	2.30	2.28	2.23	2.27
Average monthly gross wages, LTL	618	778	930	987	971	982	1014	1056
Average monthly gross wages, EUR (ER)	123	172	207	231	262	274	293	306
Average monthly gross wages, EUR (PPP)	420	475	548	597	605	626	652	694
GDP per empl. person, LTL at 1999 pr.	23711	26176	27608	27127	32235	35458	36397	38774
Unit labour costs, 1992=100	1248.0	1422.9	1612.0	1742.3	1441.5	1326.1	1333.4	1303.3
Unit labour costs, ER adj., 1992=100	572.4	722.5	824.9	937.8	895.9	850.4	885.8	867.7
Unit labour costs, PPP adj., Austria=100	20.11	26.45	30.51	34.20	32.67	30.66	31.62	30.18
Bulgaria								
Exchange rate (ER), BGN/EUR	0.220	1.896	1.972	1.956	1.956	1.956	1.956	1.956
PPP, BGN/EUR	0.0450	0.4589	0.5586	0.5662	0.5895	0.6176	0.6462	0.6443
ERDI (EUR based)	4.90	4.13	3.53	3.45	3.32	3.17	3.03	3.04
Average monthly gross wages, BGN	13	128	183	201	225	240	258	284
Average monthly gross wages, EUR (ER)	60	67	93	103	115	123	132	145
Average monthly gross wages, EUR (PPP)	294	279	328	355	381	389	399	441
GDP per empl. person, BGN at 1999 pr.	7210	7082	7375	7705	8413	8792	9190	9452
Unit labour costs, 1989=100	5228.7	51394.5	70706.6	74239.8	75933.5	77680.7	79763.6	85504.9
Unit labour costs, ER adj., 1989=100	22.1	25.2	33.3	35.3	36.1	36.9	37.9	40.6
Unit labour costs, PPP adj., Austria=100	11.03	13.14	17.56	18.33	18.74	18.96	19.28	20.14
Romania								
Exchange rate (ER), ROL/EUR	3862.90	8090.92	9989.25	16295.57	19955.75	26026.89	31255.25	37555.87
PPP, ROL/EUR	918.8	2212.7	3378.2	4877.9	6845.7	9138.1	10914.1	12928.7
ERDI (EUR based)	4.20	3.66	2.96	3.34	2.92	2.85	2.86	2.90
Average monthly gross wages, ROL	426610	846450	1357132	1957731	2876645	4282622	5452097	6741152
Average monthly gross wages, EUR (ER)	110	105	136	120	144	165	174	179
Average monthly gross wages, EUR (PPP)	464	383	402	401	420	469	500	521
GDP per empl. person, th. ROL at 1999 pr.	56113.1	52139.0	50578.0	50645.0	51768.9	55061.3	66971.0	70343.4
Unit labour costs, 1989=100	15896.6	33945.0	56104.5	80826.4	116186.1	162629.8	170221.1	200376.8
Unit labour costs, ER adj., 1989=100	67.7	69.0	92.4	81.6	95.8	102.8	89.6	87.8
Unit labour costs, PPP adj., Austria=100	22.44	23.84	32.25	28.09	32.96	34.98	30.18	28.81

*) Romania: Methodological break in 2001/2002.

Table A/1 (ctd.)

Austria

Exchange rate (ER), ATS-EUR/EUR	0.9636	1.0017	1.0089	1.0000	1.0000	1.0000	1.0000	1.0000
PPP, ATS-EUR/EUR	1.0511	1.0386	1.0407	1.0165	0.9951	1.0120	1.0158	1.0293
ERDI (EUR based)	0.92	0.96	0.97	0.98	1.00	0.99	0.98	0.97
Average monthly gross wages, EUR-ATS	2157	2180	2245	2296	2355	2389	2438	2499
Average monthly gross wages, EUR (ER)	2239	2177	2225	2296	2355	2389	2438	2499
Average monthly gross wages, EUR (PPP)	2052	2099	2157	2259	2367	2360	2400	2427
GDP per empl. person, EUR-ATS at 1999 pr.	53199	53895	55667	56647	58099	58270	58868	58792
Unit labour costs, 1989=100	118.5	118.2	117.9	118.5	118.5	119.8	121.0	124.2
Unit labour costs, ER adj., 1989=100	130.2	124.9	123.7	125.4	125.4	126.8	128.1	131.5
Unit labour costs, PPP adjusted	0.51	0.49	0.49	0.49	0.49	0.50	0.51	0.52

ER = Exchange Rate, PPP = Purchasing Power Parity, ERDI = Exchange Rate Deviation Index (ER / PPP).

ATS-EUR: ATS divided by fixed parity before 1999 (1€ = 13.7603 ATS). Labour costs approximated by gross wages and salaries. Labour productivity (GDP per employed person at 1999 prices converted to common units with PPPs for the year 1999).

For new EU member states PPPs are taken from Eurostat. For the rest of the countries PPPs have been estimated by wiiw using the OECD benchmark PPPs for 1996 and 1999 and extrapolated with GDP price deflators.

Sources: National statistics; WIFO; Eurostat; Benchmark results of the 1996 Eurostat-OECD comparison by analytical categories, OECD, 1999; Purchasing power parities and real expenditures, 1999 benchmark year, OECD 2002; wiiw estimates.

Table A/2

Indicators of macro-competitiveness, 1996-2003

	annual changes in %								
	1996	1997	1998	1999	2000	2001	2002	2003	1996-03
								prelim.	average
Czech Republic									
Exchange rate (ER), CZK/EUR	-0.9	5.3	1.0	2.0	-3.4	-4.3	-9.6	3.3	-0.8
Real ER (CPI-based)	-6.7	-1.3	-7.6	1.1	-5.3	-6.6	-9.3	5.3	-3.1
Real ER (PPI-based)	-4.9	1.2	-4.4	0.5	-4.1	-5.1	-9.2	5.3	-2.1
Average gross wages, CZK	18.3	9.9	9.2	8.4	6.4	8.7	7.2	6.7	7.2
Average gross wages, real (PPI based)	13.0	4.8	4.1	7.4	1.4	5.6	7.7	7.0	4.8
Average gross wages, real (CPI based)	8.7	1.3	-1.3	6.2	2.4	3.8	5.3	6.6	3.0
Average gross wages, EUR (ER)	19.3	4.4	8.2	6.3	10.2	13.5	18.6	3.2	8.0
Employment total	0.2	-0.7	-1.4	-2.1	-0.7	0.4	0.3	-0.7	-0.6
GDP per empl. person, CZK at 1999 pr.	4.1	0.0	0.4	2.7	7.4	2.2	1.1	3.8	2.2
Unit labour costs, CZK at 1999 prices	13.6	10.0	8.8	5.6	-0.9	6.4	6.0	2.8	4.9
Unit labour costs, ER (EUR) adjusted	14.6	4.4	7.7	3.6	2.6	11.1	17.2	-0.6	5.7
Hungary									
Exchange rate (ER), HUF/EUR	17.5	10.3	14.2	4.9	2.9	-1.3	-5.3	4.3	3.8
Real ER (CPI-based)	-2.6	-5.1	1.3	-3.5	-4.5	-7.6	-8.2	1.6	-3.3
Real ER (PPI-based)	-3.0	-7.6	1.9	-0.7	-4.0	-4.3	-3.7	3.5	-1.9
Average gross wages, HUF	20.4	22.3	18.3	13.9	13.5	18.2	18.3	12.0	14.9
Average gross wages, real (PPI based)	-1.1	1.6	6.3	8.4	1.7	12.3	20.4	9.4	7.3
Average gross wages, real (CPI based)	-2.6	3.4	3.5	3.6	3.4	8.2	12.3	7.0	5.1
Average gross wages, EUR (ER)	2.5	10.8	3.6	8.6	10.4	19.7	25.0	7.3	10.4
Employment total	-0.8	0.0	1.4	3.1	1.0	0.3	0.3	1.3	0.9
GDP per empl. person, HUF at 1999 pr.	3.1	4.7	3.4	1.1	4.2	3.7	3.1	1.6	2.7
Unit labour costs, HUF at 1999 prices	16.8	16.8	14.4	12.7	9.0	13.9	14.7	10.3	11.7
Unit labour costs, ER (EUR) adjusted	-0.6	5.9	0.1	7.4	6.0	15.4	21.1	5.7	7.5
Poland									
Exchange rate (ER), PLN/EUR	7.7	9.7	5.9	7.7	-5.1	-8.5	5.1	14.1	3.4
Real ER (CPI-based)	-8.0	-2.9	-4.1	1.6	-12.2	-11.4	5.3	15.4	-1.3
Real ER (PPI-based)	-3.7	-1.4	-2.0	1.4	-8.3	-8.2	4.0	12.9	-0.4
Average gross wages, PLN ^{*)}	26.5	21.9	15.7	10.6	11.6	8.0	2.6	4.9	9.8
Average gross wages, real (PPI based)	12.6	8.6	7.8	30.3	3.5	6.3	1.6	2.3	7.3
Average gross wages, real (CPI based)	5.5	6.1	3.5	28.3	1.3	2.4	0.7	4.1	5.5
Average gross wages, EUR (ER)	17.4	11.1	9.2	27.8	17.6	18.1	-2.4	-8.0	8.8
Employment total	1.9	2.8	2.3	-2.7	-2.3	-0.6	-2.2	-0.8	-0.5
GDP per empl. person, PLN at 1999 pr.	4.0	3.9	2.4	7.0	6.5	5.9	3.7	6.0	4.4
Unit labour costs, PLN at 1999 prices	21.7	17.3	12.9	28.7	4.8	2.0	-1.1	-1.0	7.9
Unit labour costs, ER (EUR) adjusted	12.9	6.9	6.7	19.4	10.5	11.5	-5.9	-13.2	4.1
Slovak Republic									
Exchange rate (ER), SKK/EUR	-0.1	-1.0	4.2	11.4	-3.5	1.7	-1.4	-2.8	1.0
Real ER (CPI-based)	-3.3	-5.1	-1.1	2.0	-12.2	-3.0	-2.6	-8.7	-3.9
Real ER (PPI-based)	-3.6	-4.5	0.1	6.3	-9.2	-2.6	-3.5	-8.8	-2.9
Average gross wages, SKK	13.3	13.1	8.4	7.2	6.5	8.2	9.3	6.3	7.5
Average gross wages, real (PPI based)	8.8	8.3	5.0	2.8	-3.8	1.6	7.0	-1.8	2.4
Average gross wages, real (CPI based)	7.1	6.6	1.6	-3.0	-4.9	1.0	5.8	-2.0	0.6
Average gross wages, EUR (ER)	13.5	14.3	4.1	-3.7	10.4	6.4	10.8	9.4	6.5
Employment total	3.6	-0.9	-0.3	-3.0	-1.4	1.0	0.2	1.8	-0.3
GDP per empl. person, SKK at 1999 pr.	2.5	5.5	4.6	4.6	3.5	2.7	4.2	2.4	3.4
Unit labour costs, SKK at 1999 prices	10.6	7.2	3.7	2.5	3.0	5.4	4.8	3.9	3.9
Unit labour costs, ER (EUR) adjusted	10.8	8.3	-0.5	-8.0	6.7	3.6	6.3	6.9	2.9
Slovenia									
Exchange rate (ER), SIT/EUR	10.7	6.4	3.3	4.0	5.9	5.9	4.2	3.3	4.2
Real ER (CPI-based)	3.2	-0.2	-3.1	-0.8	-0.9	-0.1	-1.1	-0.2	-0.8
Real ER (PPI-based)	4.2	1.1	-3.3	1.3	2.5	-0.8	-1.0	2.4	0.3
Average gross wages, SIT	15.3	11.7	9.6	9.6	10.6	11.9	9.7	7.5	9.0
Average gross wages, real (PPI based)	8.0	5.3	3.4	7.3	2.8	2.8	4.4	4.9	3.9
Average gross wages, real (CPI based)	4.9	3.1	1.6	3.3	1.6	3.3	2.1	1.8	2.1
Average gross wages, EUR (ER)	4.1	5.0	6.1	5.4	4.5	5.7	5.3	4.1	4.5
Employment total	-0.5	0.2	0.2	1.8	1.3	1.4	0.6	-0.8	0.6
GDP per empl. person, SIT at 1999 pr.	4.1	4.6	3.4	3.7	2.6	1.3	2.8	3.1	2.7
Unit labour costs, SIT at 1999 prices	10.8	6.8	6.0	5.6	7.8	10.5	6.7	4.3	6.0
Unit labour costs, ER (EUR) adjusted	0.0	0.4	2.7	1.6	1.8	4.4	2.5	0.9	1.8

*) Poland: Methodological change in 1999 (broader wage coverage). Growth in 1999 comparable according to new methodology.

(Table A/2 ctd.)

Table A2 (ctd.)

	1996	1997	1998	1999	2000	2001	2002	2003 prelim.	1996-03 average
Estonia									
Exchange rate (ER), EEK/EUR	1.7	4.0	0.7	-0.9	0.0	0.0	0.0	0.0	0.5
Real ER (CPI-based)	-15.4	-4.9	-5.7	-2.9	-2.0	-3.4	-1.4	0.7	-2.4
Real ER (PPI-based)	-11.0	-3.7	-4.0	-0.2	-0.7	-2.3	-0.5	1.4	-1.2
Average gross wages, EEK	25.7	19.7	15.4	7.6	10.5	12.3	11.5	9.4	11.3
Average gross wages, real (PPI based)	9.5	10.0	10.8	8.9	5.4	7.6	11.1	9.2	7.9
Average gross wages, real (CPI based)	2.1	7.6	6.7	4.2	6.3	6.1	7.6	8.0	5.8
Average gross wages, EUR (ER)	23.6	15.1	14.6	8.6	10.5	12.3	11.5	9.4	10.6
Employment total	-2.2	-0.3	-1.7	-4.5	-1.2	0.9	1.4	1.5	-0.5
GDP per empl. person, EEK at 1999 pr.	6.9	10.9	7.1	4.6	9.1	5.4	5.8	3.6	5.9
Unit labour costs, EEK at 1999 prices	17.6	7.9	7.8	2.9	1.3	6.5	5.4	5.6	4.8
Unit labour costs, ER (EUR) adjusted	15.6	3.8	7.1	3.8	1.3	6.5	5.4	5.6	4.2
Latvia									
Exchange rate (ER), LVL/EUR	1.2	-4.7	0.6	-5.7	-10.2	0.5	3.5	10.7	-0.8
Real ER (CPI-based)	-11.9	-10.6	-2.7	-6.8	-10.8	0.2	3.7	9.7	-2.2
Real ER (PPI-based)	-10.5	-7.7	-2.0	-2.3	-7.0	0.8	2.4	9.0	-0.9
Average gross wages, LVL	10.3	21.6	11.1	5.8	6.1	6.3	8.8	11.3	9.0
Average gross wages, real (PPI based)	-3.0	16.8	9.0	10.2	5.4	4.6	7.7	7.8	7.5
Average gross wages, real (CPI based)	-6.2	12.2	6.1	3.3	3.4	3.7	6.8	8.1	5.3
Average gross wages, EUR (ER)	9.0	27.6	10.4	12.2	18.1	5.8	5.1	0.5	9.9
Employment total	-2.5	4.3	-0.4	-1.8	-2.8	2.2	2.8	1.8	0.7
GDP per empl. person, LVL at 1999 pr.	17.9	3.8	5.1	5.2	10.0	5.7	3.5	5.5	4.9
Unit labour costs, LVL at 1999 prices	-6.4	17.1	5.6	0.5	-3.5	0.6	5.1	5.4	3.6
Unit labour costs, ER (EUR) adjusted	-7.5	22.9	5.0	6.6	7.4	0.2	1.5	-4.8	4.4
Lithuania									
Exchange rate (ER), LTL/EUR	-3.1	-9.7	-0.8	-4.9	-13.4	-3.1	-3.5	-0.2	-4.5
Real ER (CPI-based)	-20.4	-15.6	-4.4	-4.5	-12.6	-2.2	-1.7	3.0	-4.5
Real ER (PPI-based)	-16.4	-14.1	3.1	-7.0	-22.2	1.9	-0.8	1.9	-4.7
Average gross wages, LTL	28.6	25.9	19.5	6.2	-1.7	1.2	3.2	4.1	7.7
Average gross wages, real (PPI based)	10.3	18.7	25.0	4.4	-15.2	4.3	6.2	4.6	5.6
Average gross wages, real (CPI based)	3.2	15.6	13.7	5.4	-2.7	-0.1	2.9	5.4	4.9
Average gross wages, EUR (ER)	32.7	39.3	20.4	11.7	13.5	4.4	6.9	4.4	13.3
Employment total	-0.7	-3.1	1.7	0.1	-12.6	-3.3	4.0	2.3	-1.5
GDP per empl. person, LTL at 1999 pr.	8.8	10.4	5.5	-1.7	18.8	10.0	2.6	6.5	6.4
Unit labour costs, LTL at 1999 prices	18.2	14.0	13.3	8.1	-17.3	-8.0	0.6	-2.3	0.8
Unit labour costs, ER (EUR) adjusted	21.9	26.2	14.2	13.7	-4.5	-5.1	4.2	-2.0	5.9
Bulgaria									
Exchange rate (ER), BGN/EUR	153.8	760.2	4.0	-0.8	0.0	0.0	0.0	0.0	46.3
Real ER (CPI-based)	17.3	-24.5	-11.2	-2.2	-7.6	-4.8	-3.5	-0.3	-7.8
Real ER (PPI-based)	10.9	-19.0	-13.0	-4.0	-11.3	-1.7	-1.3	-3.1	-7.2
Average gross wages, BGN	74.4	865.6	43.3	9.7	11.7	6.9	7.3	10.2	56.4
Average gross wages, real (PPI based)	-24.2	-9.9	20.7	6.7	-5.0	3.0	6.1	5.1	3.3
Average gross wages, real (CPI based)	-21.3	-16.6	20.7	6.9	1.2	-0.4	1.4	7.8	2.7
Average gross wages, EUR (ER)	-31.3	12.3	37.7	10.6	11.7	6.9	7.3	10.2	11.2
Employment total	0.1	-3.9	-0.2	-2.1	-3.5	-0.4	0.4	1.4	-1.0
GDP per empl. person, BGN at 1999 pr.	-9.5	-1.8	4.1	4.5	9.2	4.5	4.5	2.8	3.5
Unit labour costs, BGN at 1999 prices	92.8	882.9	37.6	5.0	2.3	2.3	2.7	7.2	53.0
Unit labour costs, ER (EUR) adjusted	-24.1	14.3	32.2	5.9	2.3	2.3	2.7	7.2	7.5
Romania									
Exchange rate (ER), ROL/EUR	46.9	109.5	23.5	63.1	22.5	30.4	20.1	20.2	36.6
Real ER (CPI-based)	8.4	-16.4	-21.4	13.2	-14.3	-0.9	0.1	6.3	-5.0
Real ER (PPI-based)	-1.5	-16.5	-7.9	12.3	-16.8	-5.7	-3.8	2.2	-4.9
Average gross wages, ROL	51.7	98.4	60.3	44.3	46.9	48.9	27.3	23.6	45.3
Average gross wages, real (PPI based)	1.2	-21.5	20.4	-0.2	-4.2	5.6	2.1	3.5	0.1
Average gross wages, real (CPI based)	9.3	-22.1	0.8	-1.1	0.9	10.7	3.9	7.2	-0.8
Average gross wages, EUR (ER)	3.2	-5.3	29.9	-11.6	20.0	14.1	6.0	2.9	6.2
Employment total *)	-1.9	1.0	-1.9	-0.6	-0.1	-0.6	.	-0.1	.
GDP per empl. person, ROL at 1999 pr.	6.0	-7.1	-3.0	0.1	2.2	6.4	21.6	5.0	2.8
Unit labour costs, ROL at 1999 prices	43.1	113.5	65.3	44.1	43.7	40.0	4.7	17.7	40.9
Unit labour costs, ER (EUR) adjusted	-2.6	1.9	33.9	-11.7	17.4	7.3	-12.8	-2.0	3.3

*) Romania: In 2002 no comparable growth rate available due to methodological break.

(Table A/2 ctd.)

Table A2 (ctd.)

	1996	1997	1998	1999	2000	2001	2002	2003 prelim.	1996-03 average
Austria									
Exchange rate (ER), ATS-EUR/EUR	1.7	4.0	0.7	-0.9	0.0	0.0	0.0	0.0	0.5
Real ER (CPI-based)	2.2	4.4	1.1	-0.3	-0.4	-0.5	0.3	0.7	0.7
Real ER (PPI-based)	2.2	4.4	0.5	-0.4	0.1	0.4	0.3	0.0	0.7
Average gross wages, ATS-EUR	0.8	1.1	3.0	2.3	2.6	1.4	2.1	2.5	1.9
Average gross wages, real (PPI based)	0.8	0.7	3.4	3.3	-1.4	-0.2	2.4	0.8	1.1
Average gross wages, real (CPI based)	-1.1	-0.2	2.0	1.7	0.2	-1.2	0.2	1.2	0.5
Average gross wages, EUR (ER)	-0.9	-2.8	2.2	3.2	2.6	1.4	2.1	2.5	1.4
Employment total	-0.7	0.3	0.6	0.9	0.8	0.5	0.3	0.9	0.5
GDP per empl. person, ATS-EUR at 1999 pr.	2.7	1.3	3.3	1.8	2.6	0.3	1.0	-0.1	1.3
Unit labour costs, ATS-EUR at 1999 prices	-1.9	-0.2	-0.3	0.5	0.0	1.1	1.0	2.6	0.6
Unit labour costs, ER (EUR) adjusted	-3.6	-4.0	-1.0	1.4	0.0	1.1	1.0	2.6	0.1

ER = Exchange Rate, PPP = Purchasing Power Parity, ERDI = Exchange Rate Deviation Index (ER / PPP).
ATS-EUR: ATS divided by fixed parity before 1999 (1€ = 13.7603 ATS).

For new EU member states PPPs are taken from Eurostat. For the rest of the countries PPPs have been estimated by wiiw using the OECD benchmark PPPs for 1996 and 1999 and extrapolated with GDP price deflators.

Sources: National statistics; WIFO; Eurostat; Benchmark results of the 1996 Eurostat-OECD comparison by analytical categories, OECD, 1999; Purchasing power parities and real expenditures, 1999 benchmark year, OECD 2002; wiiw estimates.

Table A/3

Relative labour productivity gains in NMS manufacturing, 1995-2002(average annual change in % for total manufacturing (D) and relative gains DA to DN, in percentage points) ¹⁾

	Czech Republic	Estonia²⁾	Hungary	Latvia²⁾	Lithuania²⁾	Poland	Slovak Republic	Slovenia	Bulgaria	Romania
D Manufacturing total	4.0	10.3	8.0	7.5	7.0	9.3	8.0	3.0	-1.1	5.3
DA Food products; beverages and tobacco	-4.9	-5.5	-6.8	-4.8	-3.9	-3.4	-3.4	-0.4	-4.5	5.6
DB Textiles and textile products	-3.5	0.8	-2.5	0.4	-2.0	-0.7	-7.9	-1.0	-1.5	-2.7
DC Leather and leather products	-14.8	0.4	-6.6	-2.2	6.9	-1.8	-0.8	-7.3	-3.8	-4.3
DD Wood and wood products	-5.3	12.8	-6.2	-2.0	2.2	-1.3	-4.5	-6.5	4.9	-2.4
DE Pulp, paper & paper products; publishing & printing	-1.0	0.5	-4.7	-0.6	-4.0	-0.9	1.9	-5.5	-2.0	-14.0
DF Coke, refined petroleum products & nuclear fuel	19.5		-1.7	-7.5	-4.2	-7.0	-2.3	-35.1	0.8	2.3
DG Chemicals, chemical products and man-made fibres	2.6	3.8	-4.9	-4.2	6.0	0.1	-1.1	2.7	0.5	-0.6
DH Rubber and plastic products	-0.5	-0.7	-5.6	10.2	0.4	0.4	-2.7	-2.7	-0.8	-5.1
DI Other non-metallic mineral products	-1.7	3.2	-1.6	11.2	0.9	1.8	-3.0	1.8	5.6	-0.9
DJ Basic metals and fabricated metal products	-5.1	4.1	-4.8	3.3	-2.8	-1.4	-5.6	-1.5	5.3	3.0
DK Machinery and equipment n.e.c.	5.7	8.0	-0.8	-5.3	0.9	1.4	1.8	-0.1	5.0	4.2
DL Electrical and optical equipment	13.0	1.9	13.9	18.1	12.3	3.8	2.8	2.8	9.2	-0.1
DM Transport equipment	3.4	8.7	7.4	-2.4	12.4	4.9	15.6	6.0	5.7	5.9
DN Manufacturing n.e.c.	1.7	0.3	-2.9	6.9	-4.5	0.8	2.0	1.7	1.8	7.3

Notes: 1) Calculation of relative gains: DA (1995-2002) minus D (1995-2002) = relative gain DA. Positive values indicate higher, negative values lower than average productivity growth relative to total manufacturing (D). - 2) 1995-2001.

Sources: iiw estimates based on national statistics; iiw Industrial Database.

Table A/4

Labour costs in NMS manufacturing industry

(levels in 2003; growth rates 1996-2003 in %)

	Czech					Slovak				
	Bulgaria	Republic	Hungary	Poland	Romania	Republic	Slovenia	Estonia	Latvia	Lithuania
	2002					2001				
Manufacturing total (in EUR, at exchange rate)	178.3	705.6	696.4	536.0	222.8	528.2	1349.2	450.2	337.6	353.9
Austria 2003=100	4.2	16.8	16.6	12.8	5.3	12.6	32.1	10.7	8.0	8.4
Average growth rate (EUR based) 1996-2003	6.7 ¹⁾	10.3	7.3	7.1	6.0	9.0	4.9	12.6 ²⁾	11.6 ²⁾	19.4 ²⁾
Average growth rate (nat. currency based) 1996-2003	48.7 ¹⁾	9.2	13.6	11.8	47.8	10.0	10.6	13.6 ²⁾	8.1 ²⁾	12.3 ²⁾
Manufacturing total (in EUR, at PPP99 for GDP)	536.0	1389.1	1318.6	1144.4	675.1	1154.7	1835.9	884.8	697.2	791.9
Austria 2003=100	13.1	34.0	32.3	28.0	16.5	28.2	44.9	21.6	17.1	19.4
Average growth rate 1996-2003 (real, defl. with CPI)	-1.7 ¹⁾	4.0	0.7	2.7	0.0	2.4	2.6	4.1 ²⁾	1.8 ²⁾	5.3 ²⁾
D Manufacturing total (2003) =100										
DA Food products; beverages and tobacco	99.0	94.5	96.5	91.8	90.8	93.6	107.9	102.3	104.1 ³⁾	100.6 ³⁾
DB Textiles and textile products	70.0	68.4	61.2	64.0	70.1	65.3	71.0	81.1	90.5	87.2
DC Leather and leather products	64.9	63.5	60.4	63.4	72.4	62.5	72.9	79.3	68.2	85.5
DD Wood and wood products	75.8	81.6	63.6	71.7	59.2	75.0	77.6	106.4	87.2	71.2
DE Pulp, paper & paper products; publishing & printing	117.3	115.6	102.8	133.3	126.7	119.3	115.9	167.5	142.5	136.0
DF Coke, refined petroleum products & nuclear fuel	264.1	152.8	234.5	206.5	233.9	221.5	116.0	123.9 ⁴⁾	.	.
DG Chemicals, chemical products and man-made fibres	148.0	122.8	160.7	155.6	154.2	116.3	192.5	.	123.0	160.1
DH Rubber and plastic products	97.1	103.8	103.3	101.3	102.4	124.1	93.8	106.3	79.7	94.2
DI Other non-metallic mineral products	125.2	107.8	110.2	102.5	114.8	102.7	95.8	137.7	100.7	108.6
DJ Basic metals and fabricated metal products	137.3	103.1	96.8	104.0	126.8	121.2	98.2	123.1	92.6 ⁵⁾	92.1
DK Machinery and equipment n.e.c.	113.1	103.7	101.5	111.8	118.3	100.8	98.2	108.0	94.6	113.8
DL Electrical and optical equipment	116.9	100.0	104.6	115.3	119.8	88.4	99.7	112.8	100.4 ⁶⁾	132.0
DM Transport equipment	122.5	118.0	129.3	118.3	136.7	125.2	101.9	114.1	106.6	140.0
DN Manufacturing n.e.c.	72.1	80.5	70.1	77.0	77.3	87.7	81.0	93.4	87.3	85.7
Standard deviation	48.2	22.4	44.3	37.2	42.7	37.7	28.8	22.4	18.1	25.4

Notes: 1) 1997-2003. - 2) 1996-2001. - 3) Without ISIC 16: Tobacco products. - 4) DF+DG. - 5) Without ISIC 27: Basic metals. - 6) Without ISIC 30: Office, accounting and computing machinery and ISIC 33: Medical, precision and optical instruments, watches and clocks.

Sources: wiiw estimates based on national statistics.

Table A/5

Labour productivity levels in NMS manufacturing industry, year 2003

	Czech					Slovak				
	Bulgaria	Republic	Hungary	Poland	Romania	Republic	Slovenia	Estonia	Latvia	Lithuania
	2002					2001				
Manufacturing total, productivity in EUR (at PPP99 for GDP)	50069	122546	127379	106738	53854	112175	80422	51873	42657	57628
Austria 2003 = 100	26.6	65.2	67.8	56.8	28.7	59.7	42.8	27.6	22.7	30.7
Manufacturing total, productivity in EUR (at PPPCAP99)	37498	83920	87027	78420	38889	76116	73547	33078	25964	32789
Austria 2003 = 100	21.1	47.3	49.0	44.2	21.9	42.9	41.4	18.6	14.6	18.5
Manufacturing total = 100										
DA Food products; beverages and tobacco	122.9	123.9	81.7	109.4	227.5	94.0	155.8	132.6	126.4 ¹⁾	115.3 ¹⁾
DB Textiles and textile products	37.5	47.1	25.3	39.6	34.1	22.0	41.4	63.0	54.1	65.9
DC Leather and leather products	33.7	24.0	19.5	39.9	27.1	29.7	33.4	58.0	39.3	86.3
DD Wood and wood products	80.3	107.8	43.0	74.8	77.8	41.0	54.1	114.1	101.1	71.2
DE Pulp, paper & paper products; publishing & printing	95.9	112.8	79.6	128.9	103.5	119.7	102.2	145.4	105.3	90.1
DF Coke, refined petroleum products & nuclear fuel	1121.2	998.5	280.1	435.1	909.8	615.5	87.2	.	.	974.1
DG Chemicals, chemical products and man-made fibres	115.7	159.0	131.4	158.5	200.4	135.9	225.6	161.7	95.7	198.4
DH Rubber and plastic products	82.2	103.8	81.6	112.7	133.1	99.2	81.2	115.4	160.1	151.0
DI Other non-metallic mineral products	146.0	93.4	70.7	91.7	74.9	64.1	89.8	124.1	129.2	64.2
DJ Basic metals and fabricated metal products	169.2	82.7	75.2	97.2	160.5	105.1	80.0	92.5	78.9 ²⁾	69.7
DK Machinery and equipment n.e.c.	70.1	76.1	71.8	76.6	57.4	71.8	109.1	101.6	73.9	45.8
DL Electrical and optical equipment	97.6	90.2	167.6	113.7	63.0	68.3	85.1	64.7	113.1 ³⁾	101.1
DM Manufacture of transport equipment	103.0	154.5	260.6	141.3	79.7	295.4	245.0	138.4	71.0	90.5
DN Manufacturing n.e.c.	53.0	68.7	41.4	75.5	54.9	93.8	72.8	63.6 ⁴⁾	78.1	67.3
Others									210.4 ⁵⁾	
Standard deviation	267.4	235.2	78.3	93.2	216.7	148.4	60.8	33.7	42.9	230.0

Notes: 1) Without ISIC 16: Tobacco products. - 2) Without ISIC 27: Basic metals. - 3) Without ISIC 30: Office, accounting and computing machinery and ISIC 33: Medical, precision and optical instruments, watches and clocks. - 4) DF+DN. - 5) ISIC groups 16, 23, 27, 30 and 33.

Sources: wiiw estimates based on national statistics, OECD, EUROSTAT and UNIDO.

Table A/6a

International comparison of ULCs in manufacturing industry

(year 2003, PPP99 for GDP, Austria 2003=100)

	Bulgaria	Czech Republic	Hungary 2002	Poland	Romania	Slovak Republic	Slovenia	Estonia 2001	Latvia 2001	Lithuania 2001
D Manufacturing total	15.9	25.8	24.5	22.5	18.5	21.1	75.0	38.8	35.4	27.5
DA Food products; beverages and tobacco	15.5	23.7	34.8	22.7	8.9	25.3	62.7	36.1	35.1	28.9
DB Textiles and textile products	25.7	32.3	51.1	31.4	32.9	53.9	111.1	43.2	51.2	31.4
DC Leather and leather products	30.5	67.7	75.2	35.5	49.1	44.0	162.7	52.8	61.1	27.1
DD Wood and wood products	17.5	22.7	42.1	25.1	16.4	44.8	125.3	42.2	35.5	32.0
DE Pulp, paper & paper products; publishing & printing	19.7	26.7	31.9	23.5	22.9	21.2	86.0	45.2	48.4	41.9
DF Coke, refined petroleum products & nuclear fuel	12.1	12.8	66.3	34.5	15.4	24.5	.	.	.	.
DG Chemicals, chemical products and man-made fibres	25.9	25.3	38.0	28.0	18.1	22.9	81.4	.	57.9	28.2
DH Rubber and plastic products	16.3	22.4	26.9	17.5	12.3	22.9	75.3	31.0	15.3	14.9
DI Other non-metallic mineral products	10.1	22.0	28.3	18.6	21.0	25.0	59.3	31.9	20.5	34.5
DJ Basic metals and fabricated metal products	11.2	27.8	27.2	20.8	12.6	21.0	79.8	44.7	35.9	31.4
DK Machinery and equipment n.e.c.	22.1	30.2	29.7	28.2	32.8	25.4	58.0	35.4	39.0	58.7
DL Electrical and optical equipment	17.1	25.6	13.7	20.4	31.6	24.5	78.8	60.8	28.2	32.2
DM Transport equipment	25.9	26.9	16.6	25.7	43.5	12.2	42.7	43.8	72.8	58.2
DN Manufacturing n.e.c.	17.1	23.8	32.6	18.1	20.5	15.5	65.8	.	31.2	27.6

Table A/6b

International comparison of ULCs in manufacturing industry

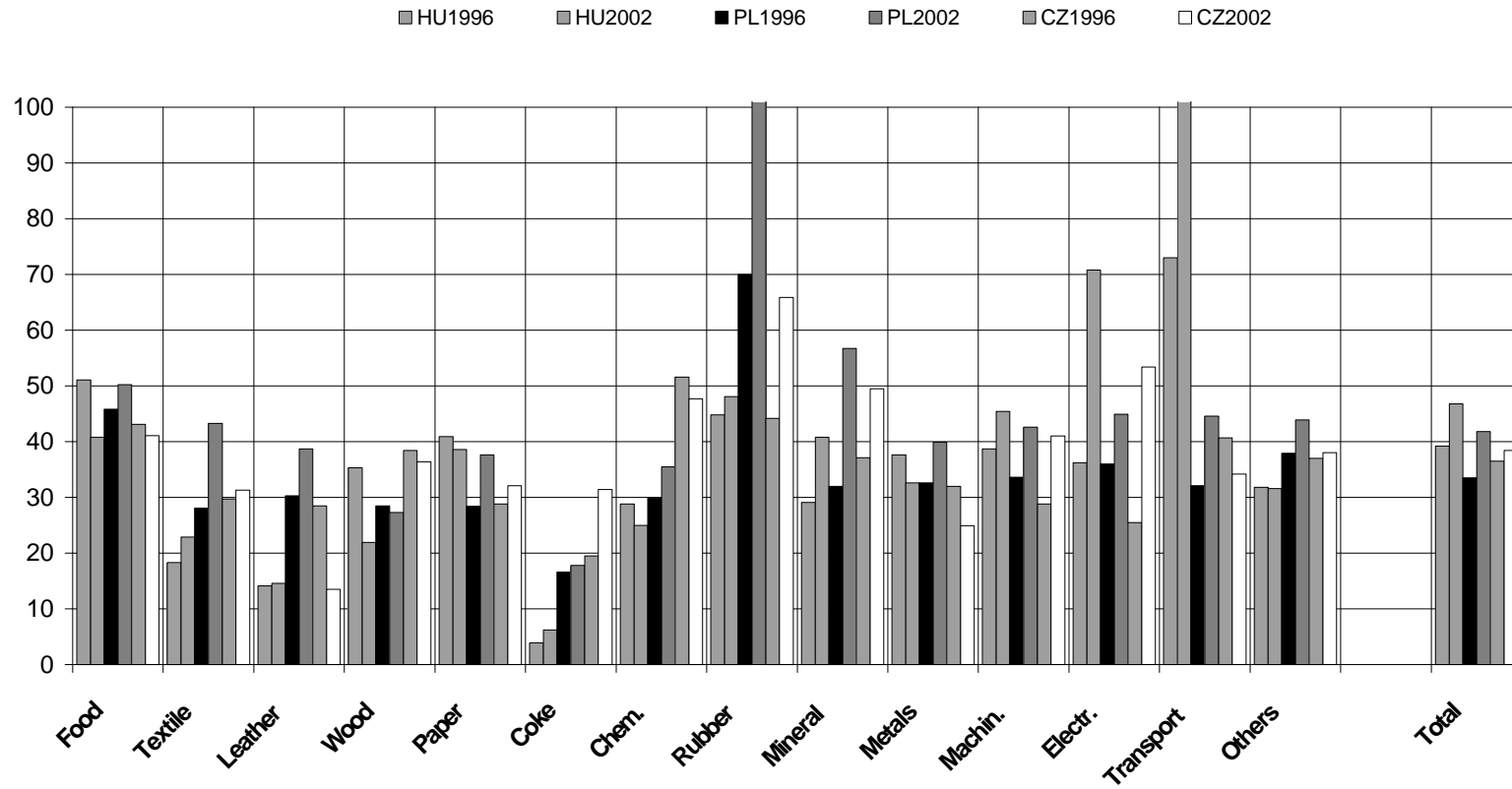
(year 2003, PPPCAP99, Austria 2003=100)

	Bulgaria	Czech Republic	Hungary 2002	Poland	Romania	Slovak Republic	Slovenia	Estonia 2001	Latvia 2001	Lithuania 2001
D Manufacturing total	20.1	35.5	33.8	28.9	24.2	29.3	77.5	57.5	54.9	45.6
DA Food products; beverages and tobacco	19.5	32.7	48.2	29.2	11.6	35.2	64.7	53.5	54.5	48.0
DB Textiles and textile products	32.4	44.5	70.6	40.3	43.0	75.0	114.8	63.9	79.4	52.1
DC Leather and leather products	38.5	93.3	103.9	45.7	64.3	61.3	168.0	78.2	94.9	44.9
DD Wood and wood products	22.1	31.3	58.3	32.2	21.4	62.4	129.4	62.4	55.1	53.1
DE Pulp, paper & paper products; publishing & printing	24.8	36.8	44.1	30.2	29.9	29.5	88.8	67.0	75.2	69.6
DF Coke, refined petroleum products & nuclear fuel	15.3	17.6	91.6	44.4	20.1	34.1	.	.	.	.
DG Chemicals, chemical products and man-made fibres	32.7	34.9	52.5	36.1	23.7	31.9	84.1	.	89.8	46.8
DH Rubber and plastic products	20.6	30.8	37.1	22.5	16.1	31.8	77.8	46.0	23.7	24.7
DI Other non-metallic mineral products	12.8	30.4	39.1	23.9	27.5	34.8	61.3	47.3	31.7	57.2
DJ Basic metals and fabricated metal products	14.1	38.3	37.6	26.7	16.5	29.2	82.4	66.1	55.7	52.1
DK Machinery and equipment n.e.c.	27.8	41.6	41.1	36.2	42.9	35.4	59.9	52.5	60.5	97.4
DL Electrical and optical equipment	21.6	35.3	18.9	26.3	41.3	34.0	81.4	90.0	43.8	53.4
DM Transport equipment	32.7	37.2	23.0	33.1	56.9	17.0	44.1	64.9	112.9	96.6
DN Manufacturing n.e.c.	21.5	32.8	45.1	23.2	26.8	21.6	67.9	.	48.3	45.7

Sources: WIIW estimates based on national statistics.

Figure A/1

**Manufacturing labour productivity in selected NMS (UVR-based), years 1996 and 2002
(Austria = 100)**



Source: wiiw Industrial Database, own estimates based on Monnikhof and van Ark (2002).

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