WIIW INDUSTRY STUDIES
2001/3

Development and Prospects of the Chemicals, Chemical Products and Man-made Fibres Sector in the Central and Eastern European Countries

WIIW INDUSTRY STUDIES

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- *Basic metals and fabricated metal products*
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Research Director, WIIW

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Doris Hanzl

Development and Prospects of the Chemicals, Chemical Products and Man-made Fibres Sector in the Central and Eastern European Countries

November 2001

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Executive summary

In Central and Eastern Europe, as in most other economies, the chemical sector is a key part of manufacturing, characterized by high concentration and fierce competition. It is considered a capital-, R&D- and skill-intensive industry, producing a wide range of products (e.g. soaps, cosmetics, pharmaceuticals, fertilizers, plastics and synthetic rubber etc.). In Central Europe, the sector has turned from a priority sector during communism into a problematic, declining sector during transition, troubled by the loss of former CMEA markets and strong import competition.

The study investigates the development and prospects of the chemical sector in the following countries:

- *Bulgaria*
- *Czech Republic*
- *Hungary*
- *Poland*
- *Romania*
- *Slovakia*
- *Slovenia*

In size, the chemical sector is still of ***relatively great importance*** *in the Central and Eastern European countries today, contributing between 6% and 8% of manufacturing output; it holds an even more prominent position in* ***Slovenia*** *and* ***Bulgaria (10%)****. The production structure is dominated by 'basic chemicals'. 'Pharmaceuticals' do play an important role in some countries.*

In the first phase of transition, which lasted from 1989 to around 1992, a severe transformational recession hit the region, with the output of the chemical sector declining even more than the rest of the economy. After 1993, production started to rise in most countries but ***growth remained weak****. This was possibly due to a slow reorientation of trade to West-European markets, the effects of the Russian crisis in 1998, growing import competition, high input prices, the lack of capital and difficulties in restructuring of large companies. In 2000, the chemical sector slightly surpassed the 1989 level in Poland and the Czech Republic only.*

As an employer, the chemical sector plays a smaller role than in production due to its capital-intensive nature and today accounts for 4% to 6% of manufacturing employment only. During transition, employment was reduced in all countries and employment shares declined.

As is typical for all CEECs and all sectors of manufacturing, wages, productivity and unit labour costs in the chemical sector have generally been much lower than in West European countries, for which we use Austria as a point of reference. During transition, sectoral wages, productivity and unit labour costs rose in all CEECs, the productivity

increase was however less pronounced than in total manufacturing. Estimated unit labour costs still remain at a much lower level than in Austria.

The range for CEECs' unit labour costs in the chemical sector as a percentage of the Austrian level is:[1]

Bulgaria	*20% - 49%*	*Romania*	*16% - 39%*
Czech Republic	*21% - 32%*	*Slovakia*	*20% - 32%*
Hungary	*34% - 55%*	*Slovenia*	*61% - 71%*
Poland	*40% - 54%*		

*In terms of chemical **exports**, trade orientation towards EU markets is below-average – the EU(15) only account for 30% to 50% of total CEE chemical exports today. Hence, in CEE manufacturing exports to the EU, the chemical sector is of minor importance, with shares ranging between 3% in Romania and 7% in Bulgaria. Export growth was negative or weak in most CEECs, only **Slovenia's** exports to the EU grew quite dynamically. Main export products are 'basic chemicals'.*

*In terms of chemical **imports**, chemical products from the EU(15) do play a major role and account for 60% to 70% of all CEE chemical imports today. Thus, in CEE manufacturing imports from the EU, import shares account for 9% to 13%. Foreign companies offer a wider range of products than domestic ones, use better marketing and have well-known brand names. The import structure is quite diversified; main import products include 'basic chemicals', 'pharmaceuticals' and 'other chemical products'.*

*The chemical sector was a **net importer from the EU** in all CEECs in 1995 to 1999. Compared to total manufacturing, the sector shows a **revealed comparative disadvantage**, which is even deteriorating, and a **relatively large negative and persistent price/quality gap indicator**.*

*On the **EU market**, the position of CEE chemical exports is **weak and deteriorating**: in 1995, CEEC(7) chemical exports had a market share of 7%, which decreased to 5% in 1998 (all shares without intra-EU trade). This share was significantly below total manufacturing market shares (9% in 1989 and 11% in 1999). On the **Austrian market**, CEE exports had a decisively larger share, accounting for 22% of Austria's non-EU imports of chemical products in 1995 and falling to 20% in 1999. The CEECs' position as a major export destination for Austrian chemical exports is also diminishing (29% of Austria's non-EU exports in 1999). In total, the CEECs registered a **sectoral trade deficit with Austria**.*

[1] The lower range is calculated at purchasing power parities (PPPs) for GDP, the upper range at PPPs for fixed capital formation; figures are for 1999.

*The chemical sector is a prominent target for **foreign direct investment**, motivated by market-seeking considerations and follow-the-leader strategies rather than by low labour costs. Nevertheless, the restructuring of the sector is apparently not yet completed.*

*The **future prospects** of the sector are quite mixed: While export competitiveness on EU markets decreased, better growth potentials exist on the domestic and CEE markets, which are however increasingly challenged by strong import competition from EU companies. For the future, ongoing restructuring, modernization and ecological upgrading have to be pursued in order to meet international demand and to comply with EU regulations.*

Key words: *chemicals, chemical products and man-made fibres sector; pharmaceutical industry; manufacturing; transition countries*

JEL classification: *L6, L65*

Doris Hanzl

Development and Prospects of the Chemicals, Chemical Products and Man-made Fibres Sector in the Central and Eastern European Countries

Part I: INDUSTRY SURVEY

The chemical sector is placed among the key manufacturing sectors, characterized by high concentration and fierce competition. It is a very heterogeneous sector, transforming various raw materials (oil and gas from the petrochemical industry, metals and minerals, as well as certain agricultural raw materials such as sugar, starch or fats) into substances with new physical and chemical properties. A large part of chemical products (approximately 33%) is further processed in the sector itself and/or supplied to other manufacturing sectors, to agriculture and to the final consumer. Products range from soaps, cosmetics and pharmaceuticals to fertilizers, plastics and synthetic rubber. The chemical industry is considered a capital-, R&D-, and skill-intensive sector, in some sub-branches it is also characterized by high energy intensity (basic chemicals). In addition, it is defined as a medium-high-technology sector – except for the high-technology pharmaceuticals sector.

This study provides a thorough picture in two parts of the chemical sector in the Central and Eastern European countries (CEECs). Part I gives a more macroeconomic survey of the developments and prospects of the sector, while Part II presents further detailed information and selected company profiles. The first part consists of four sections: Section 1 deals with trends in growth and structure of the sector, including characteristics of production and employment. Section 2 analyses indicators of international competitiveness, in particular wage rates, productivity levels and unit labour costs. Section 3 examines various aspects of trade performance with the European Union, while section 4 takes a closer look at foreign direct investment in the sector. A concluding section provides a summary and outlook on future prospects; the appendix presents additional tables and figures.

In the NACE rev. 1 classification system (Statistical classification of economic activities in the European Community) the term ‘chemicals, chemical products and man-made fibres’, thereafter called chemical sector, denotes the sub-section ‘DG’, which is identical to division '24'. The chemical sector includes the following sub-branches:

- Basic chemicals (24.1)[1]
- Pesticides and other agro-chemical products (24.2)
- Paints, varnishes and similar coatings, printing ink and mastics (24.3)
- Pharmaceuticals, medicinal and botanical products (24.4)
- Soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations (24.5)
- Other chemical products (24.6)[2]
- Man-made fibres (24.7)

The following analysis is based on this classification. Data come from the WIIW Industrial Database – Central and Eastern Europe (IDB-CEE), which currently covers Bulgaria, the Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia (CEEC(7)). Data on foreign direct investment originate from the WIIW Database on Foreign Investment Enterprises (FIEs), data on foreign trade from EUROSTAT.

1 Overview: Trends in growth and structure

The chemical sector in the region

The chemical sector plays an important role in the economies of the CEECs with a total production volume of EUR 15.5 billion and a workforce of 328,900 persons in the CEEC(7).

Among the CEEC(7), Poland was the largest producer of chemical products in terms of current production in 2000 (EUR 5.7 billion), followed by Hungary and the Czech Republic (both about EUR 3 billion). In Romania, Slovenia and Slovakia the chemical sector reached a production volume of about EUR 1 billion, in Bulgaria production was relatively small (see Table 1).

Regarding employment, Poland took again the lead in the region, followed by Romania. In Poland about 112,000 persons were employed in the chemical sector in 2000, in Romania 77,000. In the Czech Republic, Hungary and Bulgaria between 39,000 and 31,000 employees worked in the chemical sector, while the number was smaller in Slovakia (21,000) and Slovenia (12,000).

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[1] At the four-digit level 'basic chemicals' include: 'industrial gases' (24.11), 'dyes and pigments' (24.12), 'other inorganic basic chemicals' (24.13), 'other organic basic chemicals' (24.14), 'fertilizers and nitrogen compounds' (24.15), 'plastics in primary forms' (24.16) and 'synthetic rubber in primary forms' (24.17).

[2] At the four-digit level 'other chemical products' include: 'explosives' (24.61), 'glues and gelatine' (24.62), 'essential oils' (24.63), 'photographic chemical material' (24.64), 'prepared unrecorded media' (24.65) and 'other chemical products n.e.c.' (24.66).

Comparing the levels of production with the levels of employment in the different CEECs reveals significant differences in output per employee (= labour productivity) in the sector. While in Hungary, for instance, the chemical sector produced an output of EUR 3 billion with 37,000 persons, in Romania the sector produced only EUR 1.4 billion with 77,000 persons. High labour productivity occurs not only in Hungary but also in Slovenia, low productivity is observed in Romania and Bulgaria, pointing to delayed restructuring in the latter two countries (see the analysis of labour productivity below[3]).

Table 1

Chemicals, chemical products and man-made fibres

Overview of production and employment, 2000

	Production[1)]			Employment	
	EUR million	% of GDP	% of manuf.	ths. persons	% of manuf.
Bulgaria	739.3	5.68	9.5	31.0	5.9
Czech Republic[2)]	2624.5	5.13	6.7	39.3	3.8
Hungary[3)]	2900.0	5.86	7.2	37.2	5.0
Poland[2)]	5669.5	3.90	6.5	111.9	4.6
Romania[2)]	1402.4	4.24	7.8	77.0	4.9
Slovak Republic	1064.4	5.11	6.4	20.8	4.3
Slovenia[2)]	1114.0	5.91	10.0	11.7	5.2
CEEC(7)	**15514.1**	**.**	**.**	**328.9**	**.**

Notes: 1) At current prices. - 2) Production data 1999. - 3) Employment data 1999.

Source: WIIW Industrial Database.

Declining importance of the sector in production – specialization in Slovenia and Bulgaria

Today, the chemical sector is of relatively great importance in CEECs' total manufacturing; it reached about 10% of total manufacturing production in Slovenia and Bulgaria in 2000 (at current prices). In the other countries, shares were slightly smaller, with only minor variations across countries, and ranged between 6.4% in Slovakia and 7.8% in Romania (see Table 2).

The chemical sector was one of the priority sectors with regard to industrial development during the former command economy with its pronounced bias towards heavy industry and towards production of raw materials and intermediate products. It was dominated by heavy

[3] However, the analysis of labour productivity in chapter 2 uses production data at constant prices 1996 while here production figures at current prices are stated. There are marked differences between the Czech Republic and Hungary, with the Czech Republic showing higher productivity in terms of constant prices and Hungary in terms of current prices (price increase since the reference year!).

Table 2

Production shares of individual industries in total manufacturing (at current prices), 2000, in %

		Bulgaria	Czech Republic[1)]	Hungary	Poland[1)]	Romania [1)]	Slovak Republic	Slovenia[1)]
D	Manufacturing total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
DA	Food products; beverages and tobacco	23.0	17.2	15.2	24.8	21.0	12.5	14.9
DB	Textiles and textile products	6.6	4.4	3.3	4.8	7.7	3.6	7.3
DC	Leather and leather products	1.1	0.8	0.6	0.9	1.8	1.2	1.5
DD	Wood and wood products	1.5	2.7	1.1	3.8	3.4	3.0	3.2
DE	Pulp, paper & paper products; publishing and printing	4.2	4.7	4.3	6.4	3.5	6.3	7.1
DF	Coke, refined petroleum products & nuclear fuel	18.3	2.8	6.3	4.4	10.7	10.1	0.4
DG	**Chemicals, chemical products & man-made fibres**	**9.5**	**6.7**	**7.2**	**6.5**	**7.8**	**6.4**	**10.0**
DH	Rubber and plastic products	1.9	4.3	3.3	4.6	2.4	3.4	4.5
DI	Other non-metallic mineral products	4.2	6.4	2.7	5.4	4.7	4.6	4.8
DJ	Basic metals and fabricated metal products	12.5	15.9	8.1	10.7	15.8	17.0	12.3
DK	Machinery and equipment n.e.c.	9.8	8.0	4.1	5.5	5.1	6.8	10.4
DL	Electrical and optical equipment	4.3	7.9	27.2	7.2	4.7	7.9	8.6
DM	Transport equipment	1.6	14.3	15.4	10.3	7.7	14.5	9.9
DN	Manufacturing n.e.c.	1.6	3.9	1.3	4.6	3.7	2.7	5.3

Notes: 1) 1999.

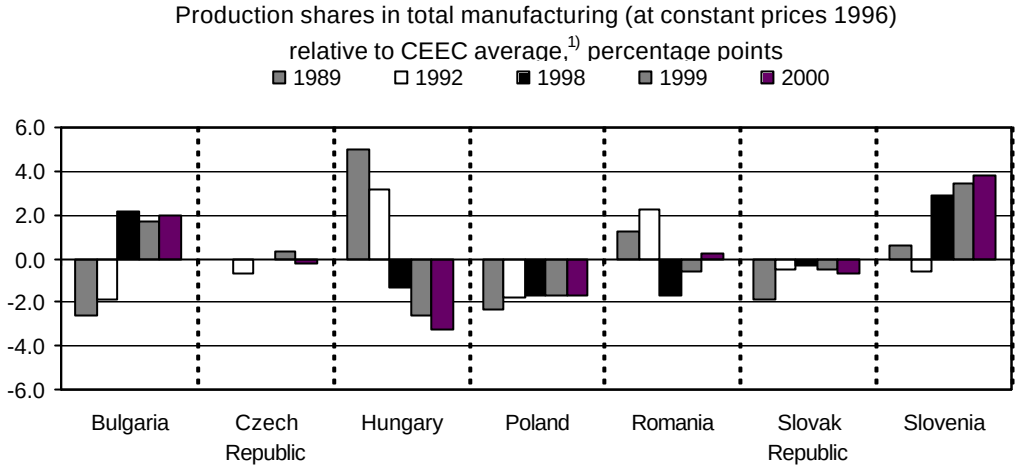
Source: WIIW Industrial Database.

chemicals, with the petrochemical industry playing a major role in the development of the sector. As natural resources were missing in most CEECs, the sector was built on the basis of cheap oil and gas imports from the Soviet Union resulting in high energy intensity. Under the Council for Mutual Economic Assistance (CMEA) division of labour, the chemical sector was promoted in Hungary, which focused on the pharmaceutical industry (16% of production, at constant prices 1996, in 1989!).[4] With the collapse of communism, the chemical sector lost its priority position and output shares declined. Import competition and the loss of CMEA market posed a severe threat to the sector. However, it did maintain part of its importance and now lies in the middle-field of manufacturing in terms of production shares. In Hungary, the former specialization on the sector vanished as other segments of manufacturing became more important (transport equipment, electrical and optical equipment). Today, the chemical sector has a prominent position only in Slovenia and Bulgaria (see Figure 1 and Table 3).

[4] In Poland, the chemical sector was focused on paints and cosmetics, in the Czech Republic also on paints. See Wilczynski (1974), p. 279.

Figure 1

Chemicals, chemical products and man-made fibres
Relative position of CEECs' chemical sectors in the region



Note: 1) The CEEC average includes the all CEEC(7) countries.

Source: WIIW Industrial Database.

Table 3

Chemicals, chemical products and man-made fibres

Production shares (at constant prices 1996), in %

Manufacturing = 100

	1989	1992	1998	1999	2000
EU-North [1)3)]	.	10.6	10.7	.	.
EU-South [2)3)]	.	8.8	8.4	.	.
Austria [4)]	9.1	8.4	6.3	6.5	.
Bulgaria	8.1	7.8	10.7	9.8	10.1
Czech Republic	.	9.0	8.5	8.5	7.9
Hungary	15.7	12.9	7.2	5.5	4.9
Poland	8.4	8.0	6.8	6.4	6.5
Romania	12.0	12.0	6.8	7.5	8.4
Slovak Republic	8.8	9.3	8.2	7.6	7.5
Slovenia	11.4	9.1	11.4	11.6	11.9

Notes: 1) Including UK, France, Germany and Belgium. - 2) Including Greece, Portugal and Spain. - 3) At current prices. - 4) 1989 and 1992 data at constant prices 1993.

Source: WIIW Industrial Database, Eurostat.

In comparison to the more advanced industrialized countries of the 'EU-North' (see Appendix, Figure A1), the chemical sector of the CEECs was mostly smaller. In Hungary and Romania, the deficit emerged in recent years only. When compared to the countries of the 'EU-South' (low-income countries), the CEECs showed a slightly larger chemical sector, although deficits also emerged in the last few years, with the only exceptions of Bulgaria and Slovenia. Austria has a relatively small chemical sector too, and hence the CEECs exhibited a structural surplus in the chemical sector over the whole period.

Weak growth pattern of the chemical sector

During the first period of transformation, from 1989 to about 1992, all CEECs experienced a severe transformational recession, and the production of the chemical sector declined as well (see Table 4). In comparison to total manufacturing, the sector was however much more affected and hence may be called a relative 'loser'[5] of this period (except in Slovakia, see Table 4, average annual changes relative to total manufacturing, 1990-1992).

This development might be explained by several factors on the demand side: First, the chemical sector produces some consumer goods the purchase of which can be deferred (e.g. cosmetics) and a wide range of products that is highly exposed to western import competition (e.g. soaps, detergents, pharmaceuticals). Second, the chemical sector produces also a variety of intermediate products, so that the downturn in other segments of manufacturing spreads to the chemical sector as well. Third, the chemical sector supplies products to the agricultural sector, such as fertilizers and pesticides, the usage of which fell over-proportionally, in part due to the general decline of this sector and also because of an overall cut of subsidies. In Hungary, for example, farmers utilized 260 kg of fertilizers per one hectare of land in 1986, only 40 kg in 1993 and about 70 kg in 1999. The decline in fertilizer usage hit bottom in most countries in 1993, in Bulgaria and Romania however the fall still continues (see Appendix, Table A2). Fourth, with the collapse of the CMEA market, important export markets for chemical products vanished. On the supply side the transition was characterized by the following processes: the closing-down of plants, the suspension of product lines (e.g. fertilizer production), the creation of new firms, and the restructuring and reorientation, respectively, of old firms.

During the second period of transformation, from about 1993 onwards, growth returned to the region and the chemical sector participated in this general upswing as well. Output of the sector started to grow in most countries, except in Hungary and Romania (see Table 4). When compared to total manufacturing, growth was smaller and the sector

[5] 'Losers' of transition are here defined as industries that performed worse than total manufacturing in terms of production growth, 'winners' are those that performed better – see Urban (1999), p. 22.

remained a 'loser' of this period as well, except in Bulgaria and Slovenia (see Table 4, average annual changes relative to total manufacturing, 1993-1999). This might be due to slow reorientation of trade to Western markets, to Eastern markets hit by the Russian crisis in 1998 and to growing import competition (e.g. in Hungary demand for pharmaceuticals grew significantly but market shares of domestic companies shrank) as well as due to higher input prices and the lack of capital. Restructuring of former large companies in the chemical sector seems to take longer than expected and to be rather difficult, also partly because of environmental requirements with respect to EU accession.

Looking at the production index for the chemical sector,[6] the decline of production in the first period was offset only in Poland and the Czech Republic, where production surpassed the 1989 level in 1996/1997. In the other countries, production still lay below the 1989 level in 2000 (see Figure 2). Interestingly, although the Hungarian economy in general did very well in comparison to the other CEECs, the development of the chemical sector was relatively weak there.

Table 4

Chemicals, chemical products and man-made fibres

Production growth (at constant prices 1996)

	Average annual changes in %		Relative to total manufacturing, in percentage points		Index 2000
	1990-92	1993-2000	1990-92	1993-2000	1989=100
Bulgaria	-20.0	9.5	-1.0	1.9	53.1
Czech Republic	.	0.7	.	-1.7	105.5 [1)]
Hungary	-19.5	-0.8	-4.3	-12.7	48.9
Poland	-13.2	6.8	-2.0	-2.8	110.4
Romania	-24.1	-6.0	0.0	-4.3	26.7
Slovak Republic	-14.7	0.2	1.3	-2.8	63.3
Slovenia	-17.6	5.1	-6.3	3.5	83.1

Notes: 1) Data have to be interpreted with caution.

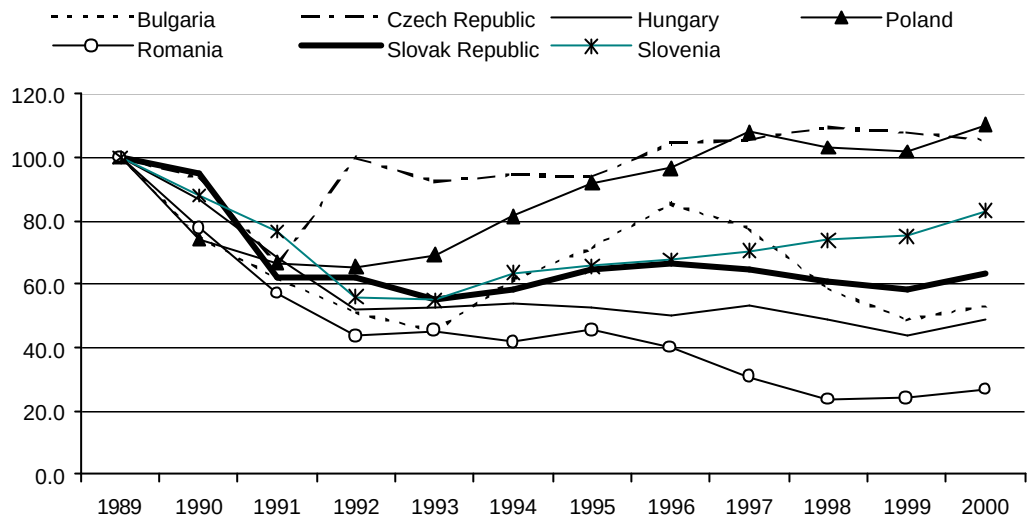
Source: WIIW Industrial Database.

[6] Data have to be interpreted with caution, especially for the Czech Republic: in that case data before 1992 can be compared with later data only to a limited extent.

Figure 2

Chemicals, chemical products and man-made fibres

Industrial production index (at constant prices 1996, national currency), 1989 = 100



Source: WIIW Industrial Database.

Minor role in employment

In employment, the chemical sector plays a smaller role than in production because of its capital-intensive nature. In 2000, employment shares in manufacturing only ranged between 4% in the Czech Republic and 6% in Bulgaria (see Table 5). In total numbers, about 112,000 persons were employed in the chemical sector in Poland, and 77,000 in Romania. In the Czech Republic, Hungary and Bulgaria between 39,000 and 31,000 employees worked in the chemical sector, while the number was even smaller in Slovakia (21,000) and Slovenia (12,000; see Table 6).

During transition, employment has declined continuously over the whole period in all CEECs. Hence, employment figures were smaller in 2000 than in 1989 (see Table 6). As the decrease was more pronounced than in manufacturing, employment shares were smaller in 2000 than in 1989, again with the exception of Bulgaria and Slovenia. However, in the last few years shares declined in all countries, pointing to enforced restructuring (see Table 5).

Comparing the production and employment shares of the chemical sector, the former were markedly larger in all CEECs both in 1989 and 2000, due to the capital-intensive character of the chemical sector (see Figure 3). However, during transition the gap decreased in all countries, except in Bulgaria and Slovakia, with a decline especially pronounced in Hungary.

Table 5

Chemicals, chemical products and man-made fibres

Employment shares, in %
Manufacturing = 100

	1989	1992	1998	1999	2000
EU-North[1)]	.	7.9	8.1	.	.
EU-South[2)]	.	5.3	4.7	.	.
Austria	6.3	6.3	4.5	4.4	.
Bulgaria	4.5	5.5	6.6	6.4	5.9
Czech Republic	.	4.8	3.8	3.9	3.8
Hungary	5.4	6.1	5.8	5.0	.
Poland	5.3	5.0	4.7	4.7	4.6
Romania	5.3 [3)]	5.5	4.9	5.0	4.9
Slovak Republic	.	6.3	4.9	4.5	4.3
Slovenia	4.4	4.6	5.4	5.3	5.2

Notes: 1) Including UK, France, Germany and Belgium. – 2) Including Greece, Portugal and Spain. – 3) 1990.

Source: WIIW Industrial Database, Eurostat.

Table 6

Chemicals, chemical products and man-made fibres

Employment
thousand persons

	1989	1992	1998	1999	2000	2000 1989=100
Bulgaria	64	48	45	39	31	48.2
Czech Republic	.	56	44	42	39	76.2 [4)]
Hungary	63	52	38	37	.	59.1 [2)]
Poland	177	140	131	122	112	63.2
Romania	183 [1)]	156	93	83	77	42.0 [3)]
Slovak Republic	.	33	25	22	21	
Slovenia	16	13	12	12	12	72.1

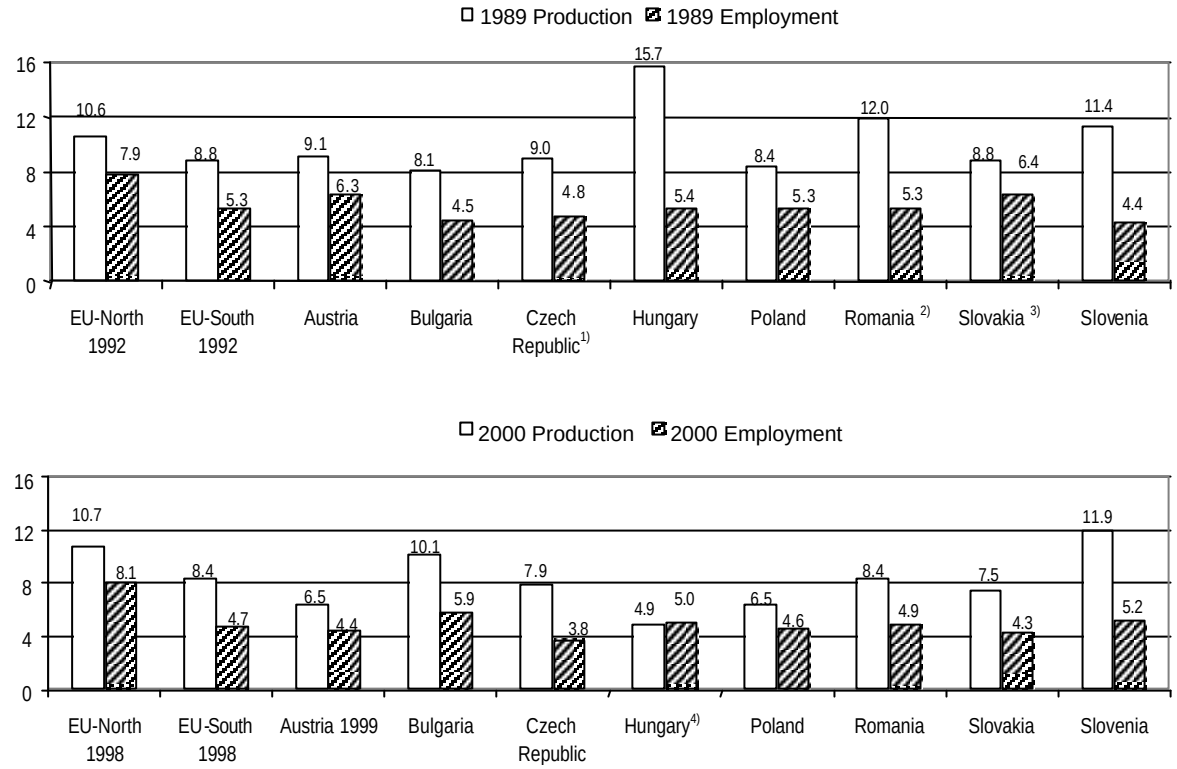
Notes: 1) 1990. – 2) 1999. – 3) 1990 = 100. – 4) Data have to be interpreted with caution.

Source: WIIW Industrial Database.

Figure 3

Chemicals, chemical products and man-made fibres

Shares in production (at constant prices 1996) and employment in total manufacturing, in %



Notes: 1) Production and employment share 1992.- 2) Employment share 1990.- 3) Employment share 1991.- 4) Employment share 1999.

Source: WIIW Industrial Database.

3 International competitiveness

As is typical for all CEECs and their manufacturing industry, wages, productivity and unit labour costs in the chemical sector have been generally lower than in Western countries, for which we have used Austria as a reference point. In 2000, nominal wage rates (gross wages at exchange rates per employee) hovered between 10% and 20% of the Austrian level in most countries; they were even lower (at 5%) in Bulgaria and Romania, but significantly higher in Slovenia (at almost 40%). The estimated productivity level of the chemical sector was particularly high in the Czech Republic and Slovenia (70%), followed by Slovakia, Poland and Hungary (about 50% of the Austrian level). In Bulgaria and Romania productivity was considerably lower with only 30% of the Austrian level. Unit labour costs reached about 20% of the Austrian level in most countries in 2000, only in

Hungary (30%), Poland (40%) and especially Slovenia (60%) they were higher (see Figure 4).[7]

Table 7

Chemicals, chemical products and man-made fibres

Average annual growth rates, 1993-2000

in %

	Output	Employment	Productivity (ECU basis)	Productivity relative to total manuf.	Wage rates (ECU basis)	Unit Labour Costs (ECU basis)
Bulgaria	0.6	-5.9	6.9	0.7	7.6	0.6
Czech Republic	0.7	-4.8	5.1	-0.9	15.3	9.0
Hungary[1)]	-2.4	-5.2	3.0	-11.4	9.0	5.8
Poland	6.8	-2.7	9.8	-1.5	15.3	5.0
Romania	-6.0	-8.5	2.7	-3.1	10.3	7.4
Slovak Republic	0.2	-6.5	7.1	0.3	11.6	4.2
Slovenia	5.1	-1.5	6.6	1.1	10.8 [1)]	4.7 [1)]

Notes: 1) 1993-1999.

Source: WIIW Industrial Database.

During transition, wages and productivity grew throughout the region. Between 1993 and 2000, the wage rate increased by more than 10% annually in most countries, the productivity increase was relatively smaller (see Table 7). However, when compared to total manufacturing, the productivity increase in the chemical sector was less pronounced, making the sector a relative productivity loser, except in the Slovak Republic, Slovenia, and Bulgaria.[8] As the wage increase was higher than the productivity increase, unit labour costs rose in all countries and cost competitiveness of the sector decreased (see Table 7). Both the relatively weak productivity performance and declining cost advantages point to serious problems in the restructuring of the chemical sector in the CEECs.

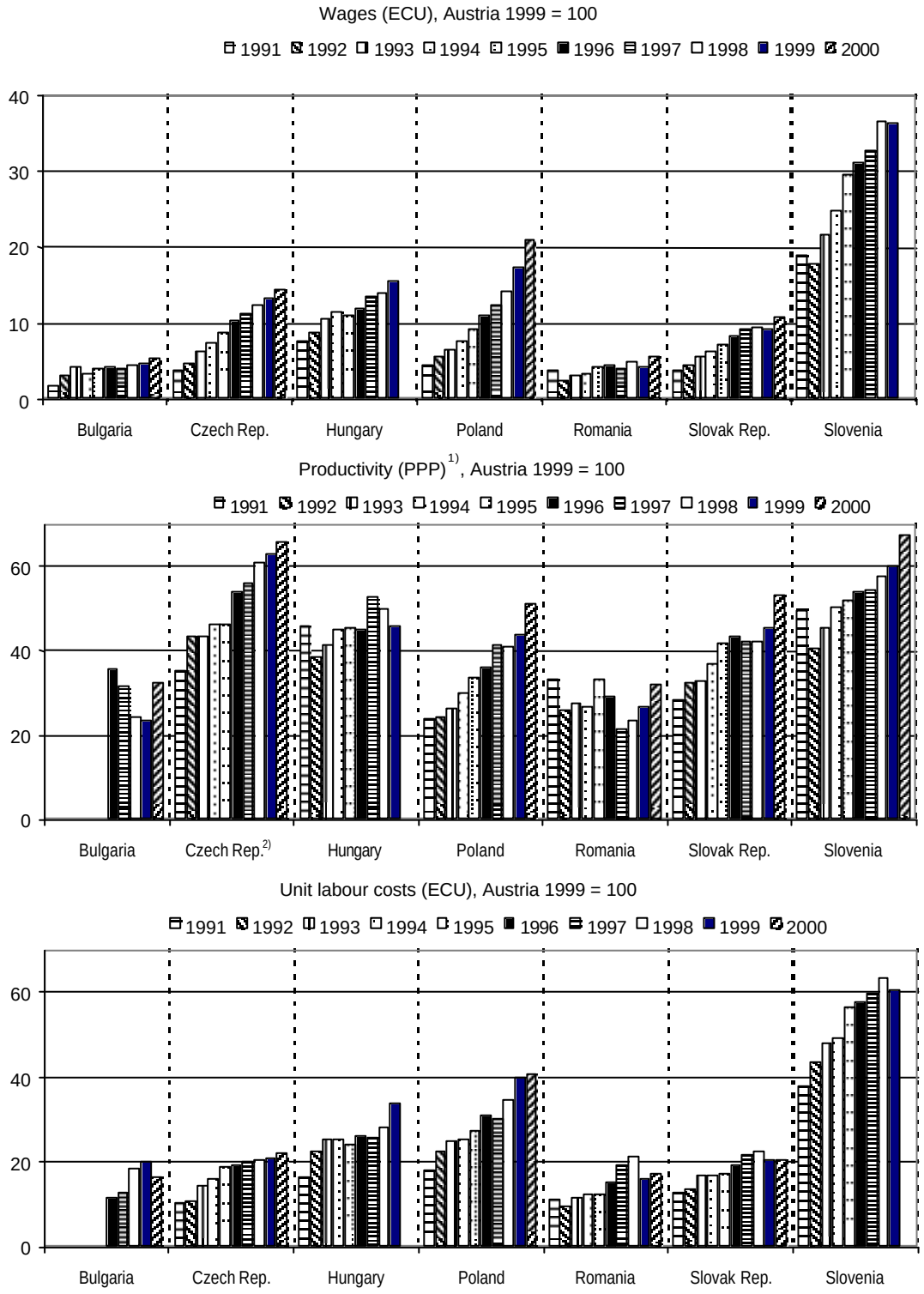
Looking at the wage level in the chemical sector, wages lay significantly above the total manufacturing average in 2000. In Hungary workers received remarkably more than the manufacturing average (160%), in the Czech and Slovak Republic still considerably more (120%). During transition relative wages increased distinctively in most countries (Table 8).

[7] These figures are however strongly affected by different productivity measures. Table A3 in the Appendix shows the lower and upper ranges for estimated unit labour costs in 1999, using alternative measures for productivity. In the text, only the lower range (productivity calculated at PPPs for GDP) is stated. When using the upper range (productivity calculated at PPPs for fixed capital formation) unit labour costs are higher but still below the Austrian level.

[8] For an analysis of all manufacturing sectors compare Havlik (2001), p. 10f.

Figure 4

Chemicals, chemical products and man-made fibres



Notes: 1) PPP = Purchasing Power Parities for GDP. – 2) Coverage of Czech industrial statistics had a break in 1996/97 due to the size of enterprises included.
Source: WIIW Industrial Database.

Table 8

Chemicals, chemical products and man-made fibres

Average monthly gross wages

Manufacturing = 100

	1992	1995	1998	1999	2000
Bulgaria	146.0	136.5	141.4	142.3	142.8
Czech Republic	112.3	116.8	121.0	123.2	121.1
Hungary	130.0	140.1	151.9	159.9	.
Poland	112.2	132.7	143.2	142.9	146.6
Romania	128.1	123.5	131.6	132.2	142.9
Slovak Republic	115.4	118.8	116.2	118.1	121.4
Slovenia	132.6	150.3	159.4	151.0	.

Source: WIIW Industrial Database.

3 Trade performance with the EU(15)

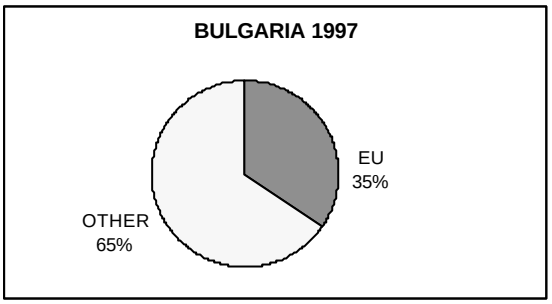
Trade with the EU is investigated in detail as the EU is the dominant trading partner of all CEECs today: after the collapse of the CMEA market, CEECs' trade became heavily oriented towards EU markets.[9] In the chemical sector, however, the CEECs' trade orientation differs significantly between exports and imports (see Figure 5): in terms of imports, the EU(15) have become the major trading partner also in the chemical sector. By the end of the 1990s, the EU(15) accounted for 60% to 70% of CEECs' chemical imports in the region, hence being slightly more important than for total imports (compare footnote 9). However, in terms of exports, trade reorientation was less pronounced and exports to the EU(15) only reached between 30% and 50% of total chemical exports in 1999. Thus the chemical sector is significantly less oriented towards the EU than are total exports (compare again footnote 9). The share of exports going to the EU(15) in 1999 was largest in Poland (52%), the Czech Republic (46%) and Hungary (44%) and smallest in Slovenia (29%). The low share of exports destined for the EU can be attributed to the strong focus on the CMEA market during communism that has probably been maintained.

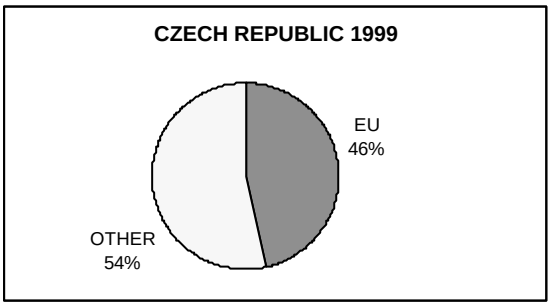
[9] By 1999, more than 70% of Hungarian total exports went to the EU(15), for Poland and the Czech Republics the levels were about 70%, for Romania and Slovenia somewhat below 70%, for the Slovak Republic 60%, and for Bulgaria around 40%. On the import side, Slovenian and Polish imports from the EU(15) accounted for roughly 70%, in the Czech Republic, Hungary and Romania EU(15) imports had a share of 60%, in Slovakia 50% and in Bulgaria only 40%.

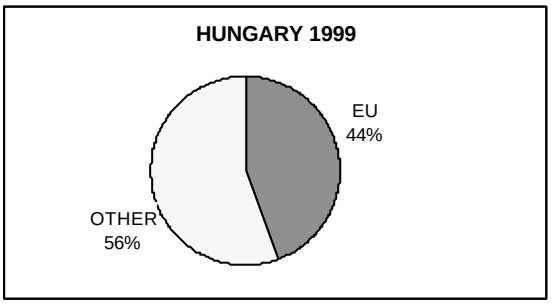
Figure 5

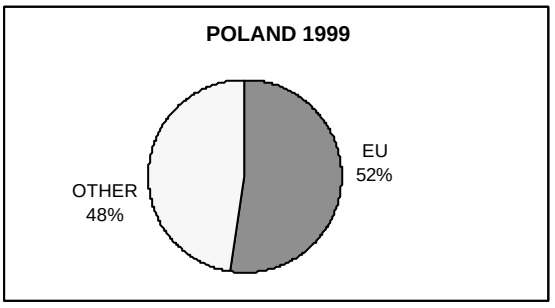
Chemicals, chemical products and man-made fibres
CEECs' exports to and imports from the world

Exports to the world

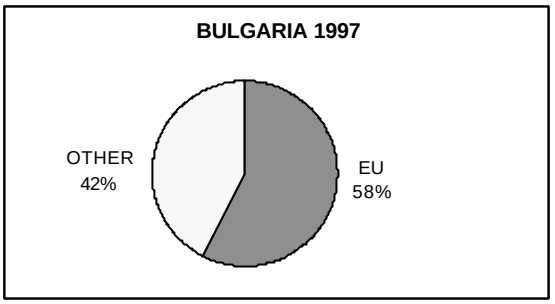


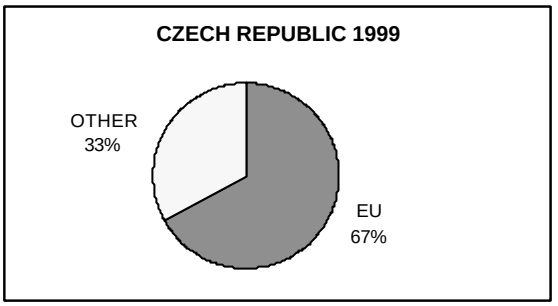


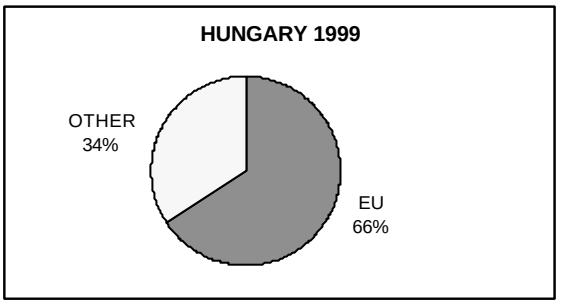


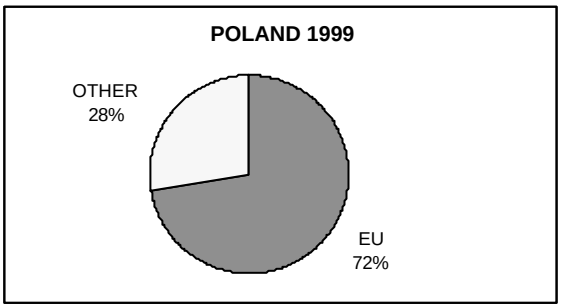


Imports from the world





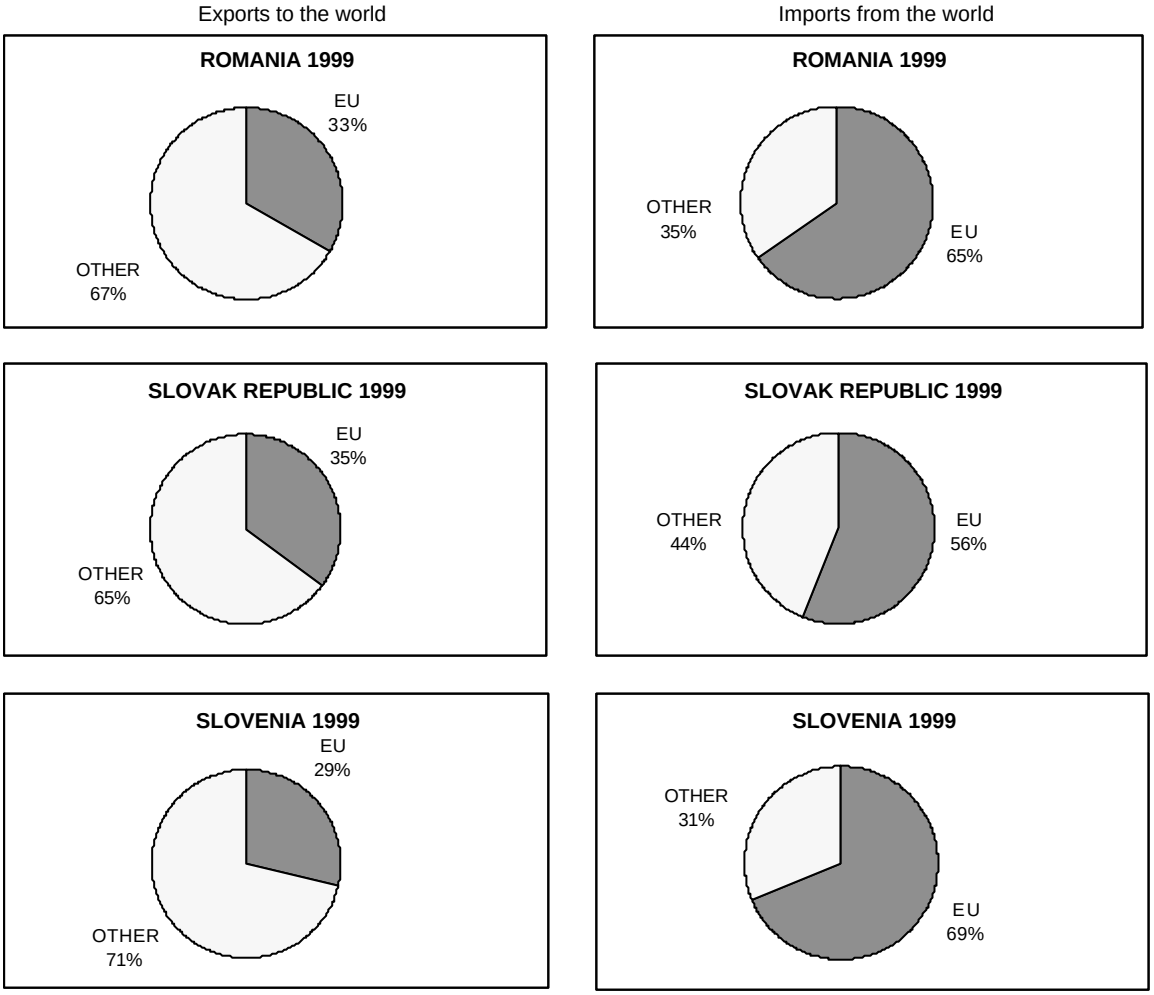




(Figure 5 contd)

(Figure 5 contd.)

Chemicals, chemical products and man-made fibres
CEECs' exports to and imports from the world



Source: UN-Database.

Smaller role in exports than in imports

In total manufacturing exports to the EU(15), the chemical sector is of minor importance today: In 1999, it only accounted for 3% of all manufacturing exports going to the EU(15) in Romania, 4% in Hungary, 5% in the Czech Republic, Poland, Slovakia and Slovenia, and was only slightly more important in Bulgaria with 7% (see Appendix, Table A4 and Figure A2). In general, export shares were smaller than production shares, indicating a below-average export orientation of the chemical sector to the EU(15).

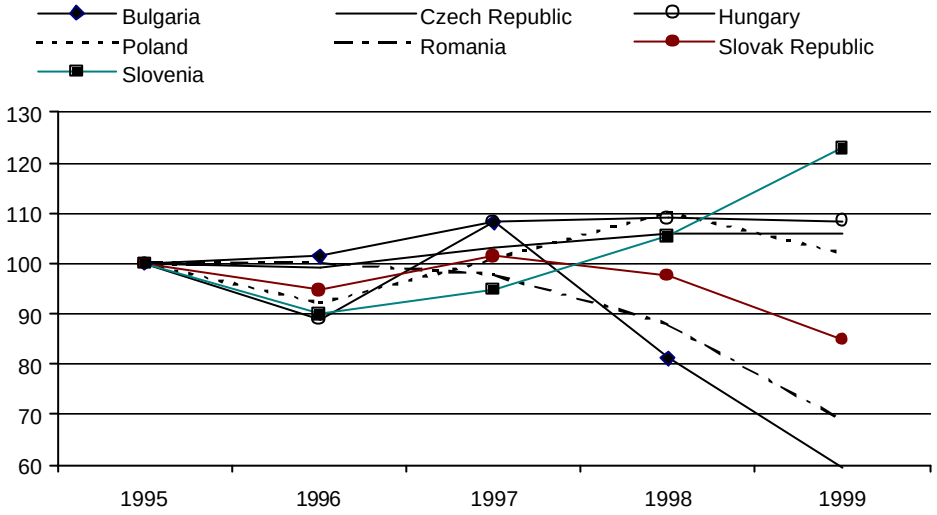
The development of exports between 1995 and 1999 differed markedly between Slovenia and the other CEECs: In Slovenia, chemical sector exports grew quite dynamically and export shares remained constant. In the other CEECs, export shares fell, either because

growth was slower than in total manufacturing (Hungary, Czech Republic, Poland) or because chemical sector exports fell in real terms (Bulgaria, Romania and Slovakia; see Figure 6). Indeed, the sector experienced the largest absolute export decline in total manufacturing in Bulgaria and Slovakia.[10] These developments can be explained by the following reasons: In Slovenia, exports of 'man-made fibres' and 'pharmaceuticals' belonged to the 30 biggest winners in exports in terms of their competitive gain, while in all other countries exports of 'basic chemicals' were *the* largest loser; in addition 'pharmaceuticals' were another loser in Bulgaria, Romania and Slovakia.[11]

Figure 6

Chemicals, chemical products and man-made fibres

Export index EU(15), in ECU mn, 1995=100



Source: Eurostat, WIIW calculations

In total manufacturing imports from the EU(15), the chemical sector plays a major role: In 1999, import shares ranged between 9% in Slovakia and Romania and 13% in Bulgaria and Poland (see Appendix, Figure A2). This is partly due to increased demand for pharmaceutical imports as foreign companies offer a wider range of products, use better marketing and have well-known brand names. Between 1995 and 1999, imports grew in all countries, but somewhat less than in total manufacturing, hence import shares remained constant or declined slightly.

Imports rising faster than exports in absolute terms led to an increasing sectoral trade deficit in all CEECs. (However, Bulgaria experienced a sectoral surplus between 1995 and 1997; in Slovenia the sectoral trade deficit remained nearly constant.) In Bulgaria,

[10] In these two countries, chemical sector exports played an important role in 1995; they accounted for 16% of manufacturing exports in Bulgaria and 11% in Slovakia. In both countries these shares have been declining, yet in Bulgaria chemical exports are still of relatively high significance.

[11] See Havlik, Landesmann and Stehrer (2001).

Romania, Slovakia and Slovenia the sectoral trade deficit was at a moderate level in 1999, whereas in the Czech Republic and Hungary it had already reached ECU 1 billion. In Poland, rapidly growing imports brought the trade deficit in the chemical sector to the highest level of all CEECs, with approximately ECU 3 billion (see Appendix, Figure A2).

Export structure concentrated on 'basic chemicals', imports diversified

At the more detailed three-digit NACE level (see Table 9), in 1999 exports of the CEECs to the EU(15) were heavily concentrated on 'basic chemicals' (between 60% and 80% of the sector's exports). The concentration was most pronounced in Bulgaria (80%), followed by Poland, Romania, the Czech Republic and Hungary (75% to 70%), while it was smaller in Slovakia and Slovenia (65% and 60%).[12] Apart from this sub-branch, exports of 'man-made fibres' played a relatively important role in Poland and Romania (10%), and especially in Slovenia and Slovakia (about 20%). 'Pharmaceutical' exports were relatively important only in Hungary (14%).

Between 1995 and 1999 the dominance of 'basic chemicals' in the export structure weakened due to the absolute decline of exports of this sub-branch (except from Slovenia). Export shares of 'soap, cleaning, polishing, perfumes & toilet articles', 'other chemical products' and 'man-made-fibres' gained slightly in size in most CEECs (on the CEEC-7 average about 2 percentage points), while in absolute terms exports of 'soap, cleaning, polishing, perfumes & toilet articles' as well as 'paints, varnishes and similar coatings' showed the highest growth rates in most CEECs.

In contrast to the export structure, the import structure of the chemical sector was very diversified in 1999 (see Table 10): Major import shares were those of 'basic chemicals', 'pharmaceuticals' and 'other chemical products' (between 20% and 30% each!), followed by 'paints, varnishes and similar coatings' and 'soap, cleaning, polishing, perfumes & toilet preparations' (both about 10%).

Between 1995 and 1999, the importance of 'basic chemicals' imports in the import structure declined somewhat (but less than in exports); 'pharmaceuticals' and also 'other chemical products' gained in relative size.

[12] Although also dominating in the production structures of most CEECs today, 'basic chemicals' are heavily over-represented in the export structure, representing a major weakness of the chemical sector in the region.

Table 9

Detailed export structure of the chemical sector, trade with EU(15), 1999, in %

		Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
24.1	Basic chemicals	78.4	73.2	70.9	75.0	74.9	65.0	61.6
24.2	Pesticides and other agro-chemical products	0.8	1.0	1.3	0.6	2.4	0.7	1.3
24.3	Paints, varnishes and similar coatings	0.0	2.1	0.6	0.5	0.1	0.2	1.3
24.4	Pharmaceuticals	9.3	7.6	13.9	2.6	8.4	4.0	9.2
24.5	Soap, cleaning, polishing, perfumes & toilet preparations	2.4	4.8	1.9	6.6	0.6	1.2	2.9
24.6	Other chemical products	5.8	5.5	8.7	4.3	2.4	7.2	5.8
24.7	Man-made fibres	3.2	5.8	2.8	10.4	11.3	21.7	17.8
DG	**Chemicals, chemical products and man-made fibres**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	in ECU mn	**7.4**	**4.6**	**3.6**	**4.8**	**2.6**	**4.9**	**4.8**

Source: Eurostat, WIIW calculations.

Table 10

Detailed import structure of the chemical sector, trade with EU(15), 1999, in %

		Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
24.1	Basic chemicals	20.7	25.9	25.5	28.3	22.7	26.8	33.0
24.2	Pesticides and other agro-chemical products	5.1	3.1	4.2	3.9	5.5	2.9	1.8
24.3	Paints, varnishes and similar coatings	7.0	12.0	7.8	11.7	11.5	12.6	10.2
24.4	Pharmaceuticals	24.1	25.5	25.6	25.4	28.6	29.1	20.5
24.5	Soap, cleaning, polishing, perfumes & toilet preparations	15.2	12.8	9.7	11.2	9.7	6.0	14.3
24.6	Other chemical products	27.3	18.8	25.9	18.2	21.0	21.6	17.6
24.7	Man-made fibres	0.7	1.9	1.3	1.4	1.0	1.0	2.6
DG	**Chemicals, chemical products and man-made fibres**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
	in ECU mn	**318.1**	**1797.7**	**1594.5**	**3490.4**	**551.1**	**477.9**	**636.6**

Source: Eurostat, WIIW calculations.

Table 11

Chemicals, chemical products and man-made fibres

Price/quality gap indicator for CEECs' exports to the EU[1)]

			Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
24.1	Basic chemicals	**1999**	-0.067	-0.081	-0.079	-0.157	-0.170	-0.233	-0.219
24.2	Pesticides and other agro-chemical products	**1999**	-0.179	-0.553	0.445	-0.124	-0.342	-0.655	0.487
24.3	Paints, varnishes and similar coatings	**1999**	-0.285	-0.352	-0.667	-0.023	-0.052	0.656	-0.141
24.4	Pharmaceuticals	**1999**	-0.644	-0.270	-0.211	-0.244	-0.458	-0.033	1.119
24.5	Soap, cleaning, polishing, perfumes & toilet preparations	**1999**	-0.151	-0.443	-0.144	-0.281	-0.225	-0.100	-0.245
24.6	Other chemical products	**1999**	0.713	-0.239	0.156	-0.082	-0.101	-0.063	-0.309
24.7	Man-made fibres	**1999**	-0.374	-0.228	-0.040	-0.211	-0.209	-0.270	-0.128
DG	**Chemicals, chemical products and**	**1995**	-0.149	-0.072	-0.086	-0.110	-0.105	-0.149	-0.160
	man-made fibres	**1996**	-0.124	-0.044	-0.102	-0.141	-0.147	-0.193	-0.175
		1997	-0.116	-0.065	-0.118	-0.130	-0.135	-0.224	-0.179
		1998	-0.133	-0.097	-0.160	-0.166	-0.113	-0.197	-0.145
		1999	**-0.131**	**-0.141**	**-0.077**	**-0.171**	**-0.210**	**-0.227**	**-0.140**
		average 1995-1999	**-0.131**	**-0.084**	**-0.109**	**-0.144**	**-0.142**	**-0.198**	**-0.160**
		change in %, 1995-1999	**0.3**	**-2.1**	**-0.5**	**-1.7**	**-2.1**	**-2.0**	**0.8**

Notes: 1) Defined as the unit value ratio uvr_t^c of country c, which shows the percentage deviation from the average EU import unit value. For a detailed explanation see Havlik, Landesmann and (2001), p. 25.

Source: Calculations by R. Stehrer, WIIW.

Relatively large and persistent export price gaps

The price/quality gap indicator (measured by export unit values, value per kg) reveals differences in export prices which under certain conditions can be interpreted as differences in product quality. For the average 1995-1999 and the year 1999 as well, the price/quality gap indicator was negative for exports of the chemical sector from all CEECs to the EU(15) and relatively large: values for 1999 ranged between -7% in Hungary and -23% in the Slovak Republic (see Table 11). Compared to total manufacturing, the chemical sector did not show the largest export price/quality gap, but belonged to the middle-field.[13] However, between 1995 and 1999 the indicator worsened, or remained nearly constant (in Bulgaria and Slovenia), pointing to a downgrading of exports and declining competitiveness.

At a more detailed level, the price/quality gap indicator was mostly negative across sub-branches, with only rare exceptions. Table 11 gives the 1999 values, presenting however a snapshot in time only. Continuous positive indicators (between 1995 and 1999) can be found for 'other chemical products' in Bulgaria (rose oil!), 'paints, varnishes and other coatings' in Slovakia and 'pesticides and other agro-chemicals' in Slovenia. In addition, there were positive indicators for three years in 'paints, varnishes and other coatings' in Poland and 'pharmaceuticals' in Hungary and Slovenia. Price/quality gap indicators were negative across all branches in the Czech Republic and Romania.

Weak and deteriorating position on the EU market

In 1995, CEEC(7) chemical sector exports to the EU(15) had a market share of 7%, which declined to 5% in 1999, as export volumes from the CEECs remained nearly constant at EUR 3 billion (all shares without intra-EU trade). Compared to total manufacturing market shares (9% in 1995 and 11% in 1999) the chemical sector shares were lower in both years, but while the gap was relatively small in 1995 it had grown dramatically by 1999, reflecting a weakening position of the sector in foreign trade (see Table 12). In 1999, the largest exporters to the EU were Poland, the Czech Republic and Hungary with market shares of 1.3%, 1.2% and 1% respectively; all other countries held market shares below 1%.

[13] See Havlik, Landesmann and Stehrer (2001).

Table 12

Chemicals, chemical products and man-made fibres

CEECs' exports to the EU(15) in ECU million, market shares in %

	EU(15) extra-EU imports, ECU mn	Bulgaria		Czech Republic		Hungary		Poland	
		ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%
1995	44448.7	260.7	0.59	699.0	1.57	559.5	1.26	770.1	1.73
1996	45661.6	264.6	0.58	692.9	1.52	497.0	1.09	709.0	1.55
1997	52287.3	281.9	0.54	722.4	1.38	606.2	1.16	776.7	1.49
1998	56098.0	211.5	0.38	741.4	1.32	609.7	1.09	848.8	1.51
1999	59969.3	154.9	0.26	741.6	1.24	606.4	1.01	785.3	1.31

	Romania		Slovak Republic		Slovenia		CEEC(7)		Total Manufacturing CEEC(7)[1)]	
	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%
1995	212.1	0.48	336.9	0.76	205.4	0.46	3043.6	6.85	38401	8.93
1996	212.2	0.46	318.7	0.70	184.7	0.40	2879.1	6.31	40903	9.05
1997	207.4	0.40	341.7	0.65	194.7	0.37	3131.1	5.99	49447	9.48
1998	186.6	0.33	328.8	0.59	216.5	0.39	3143.2	5.60	59900	10.43
1999	145.7	0.24	286.1	0.48	252.5	0.42	2972.4	4.96	67623	10.71

Notes: 1) CEEC(7) total manufacturing exports to the EU and their market shares.

Source: Eurostat, WIIW calculations.

Trade deficit with Austria in the chemical sector

Imports from the CEEC(7) had a remarkably larger share on Austria's market than on the EU(15) market, accounting for 22% of Austria's non-EU chemical imports in 1995, peaking in 1997 with 25% and falling again to 20% by 1999. Main import items were 'basic chemicals' (accounting for 50% of all chemical imports from Slovenia to 90% from Slovakia). The most important source of chemical imports from the CEECs was Hungary, with 6% of all Austrian extra-EU imports, followed by the Czech Republic, Slovenia, Slovakia and Poland. Romania and Bulgaria held market shares of less than 1% on the Austrian market. While imports from all countries fluctuated, only those from Slovenia grew steadily (see Table 13).

Chemical exports from Austria to the CEECs

The CEEC(7) market is a major export destination of Austria's non-EU chemical exports, although its relative importance is declining. In 1995, the CEEC(7) accounted for 36% of all extra-EU(15) chemical exports, climbing to 41% in 1996 but then falling to 29% by 1999. Important export items were 'other chemical products', 'basic chemicals' and 'pharmaceuticals' (28%, 24% and 22% respectively of total exports going to the CEEC (7)),

Table 13

Chemicals, chemical products and man-made fibres

CEECs' exports to Austria in ECU million, market shares in %

	Austria extra-EU(15) imports, ECU mn	Bulgaria ECU mn	Bulgaria %	Czech Republic ECU mn	Czech Republic %	Hungary ECU mn	Hungary %	Poland ECU mn	Poland %
1995	969.1	1.7	0.18	41.2	4.25	65.9	6.80	23.6	2.44
1996	1061.0	2.4	0.23	50.6	4.77	66.2	6.24	22.2	2.09
1997	1170.3	7.5	0.64	63.2	5.40	83.1	7.10	25.0	2.14
1998	1309.9	9.9	0.76	55.8	4.26	77.6	5.92	23.5	1.79
1999	1379.2	4.5	0.33	62.1	4.50	79.0	5.72	24.6	1.79

	Romania ECU mn	Romania %	Slovak Republic ECU mn	Slovak Republic %	Slovenia ECU mn	Slovenia %	CEEC(7)[1] ECU mn	CEEC(7)[1] %
1995	10.3	1.06	42.2	4.36	27.2	2.81	212.1	21.89
1996	14.9	1.41	46.0	4.34	39.4	3.71	241.8	22.79
1997	12.7	1.08	55.9	4.78	41.8	3.57	289.1	24.71
1998	15.8	1.21	49.1	3.75	50.2	3.83	281.9	21.52
1999	11.8	0.85	40.3	2.92	53.9	3.91	276.2	20.02

Note: 1) Including Bulgaria, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic and Slovenia.

Source: Eurostat, WIIW calculations.

Table 14

Chemicals, chemical products and man-made fibres

CEECs' imports from Austria in ECU million, market shares in %

	Austria extra-EU(15) exports	Bulgaria ECU mn	Bulgaria %	Czech Republic ECU mn	Czech Republic %	Hungary ECU mn	Hungary %	Poland ECU mn	Poland %
1995	1207.9	17.3	1.43	113.9	9.43	114.9	9.51	48.0	3.97
1996	1108.7	14.1	1.27	116.3	10.49	109.6	9.89	54.3	4.89
1997	1787.7	19.9	1.11	144.3	8.07	137.9	7.71	77.8	4.35
1998	1824.0	27.5	1.51	132.7	7.28	144.0	7.90	75.5	4.14
1999	2202.1	30.0	1.36	143.4	6.51	168.8	7.66	86.5	3.93

	Romania ECU mn	Romania %	Slovak Republic ECU mn	Slovak Republic %	Slovenia ECU mn	Slovenia %	CEEC(7)[1] ECU mn	CEEC(7)[1] %
1995	22.8	1.89	49.8	4.13	73.1	6.05	439.7	36.41
1996	27.4	2.47	60.9	5.49	68.7	6.20	451.2	40.70
1997	32.0	1.79	75.7	4.23	103.4	5.78	590.9	33.06
1998	37.2	2.04	73.0	4.00	98.0	5.37	587.9	32.23
1999	33.5	1.52	71.8	3.26	102.4	4.65	636.2	28.89

Note: 1) Including Bulgaria, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic and Slovenia.

Source: Eurostat, WIIW calculations.

followed by 'paints, varnishes and similar coatings' and 'soap, cleaning, polishing, perfumes & toilet preparations' (16% and 10% respectively). Major export destinations were Hungary and the Czech Republic (8% and 7% respectively of Austrian exports), less important ones were Slovenia, Poland and Slovakia (see Table 14).

In fact, chemical exports from Austria to the CEEC(7) had been larger than imports from these countries, leading to a surplus for Austria and a trade deficit for the CEECs in this sector. Austria's total trade surplus in the sector reached ECU 360 million in 1999. The trade deficit in the individual CEECs ranged between EUR 22 million in Romania and EUR 90 million in Hungary. (The trade deficit was prevalent in *all* years and in *all* countries.)

Deteriorating revealed comparative disadvantage

Revealed comparative advantage values (RCAs)[14] in relation to the EU(15) for the chemical sector have been negative in all countries, except for Bulgaria in the first few years, reflecting their negative sectoral trade balances (see Table 15). Also, when compared to manufacturing as a whole,[15] data indicate a comparative *dis*advantage of the chemical sector in all CEECs. In 1999 the disadvantage was largest in Romania and Hungary and smallest in Bulgaria. Relative RCAs deteriorated over time and values were worse in 1999 than in 1995; only in Slovenia did values slightly improve during this period (see Table 16).

Within the chemical sector, nearly all sub-branches showed a negative trade balance between 1995 and 1999. Only some were in surplus, including 'man-made fibres' in all countries except Hungary, and 'basic chemicals' except in Poland, Slovenia and Romania (in the latter country the value turned negative in 1999 only, see Table 17).

[14] Measured as RCA = (exports – imports) / (exports + imports).

[15] Measured as relative RCA = RCA (sector) – RCA (total manufacturing).

Table 15

Chemical sector RCAs

	1995	1996	1997	1998	1999
Bulgaria	0.04	0.13	0.17	-0.13	-0.35
Czech Republic	-0.26	-0.34	-0.37	-0.39	-0.42
Hungary	-0.28	-0.37	-0.36	-0.40	-0.45
Poland	-0.40	-0.52	-0.57	-0.57	-0.63
Romania	-0.23	-0.30	-0.34	-0.47	-0.58
Slovak Republic	-0.01	-0.10	-0.13	-0.18	-0.25
Slovenia	-0.46	-0.48	-0.50	-0.48	-0.43
Greece	-0.82	-0.83	-0.84	-0.82	-0.79
Portugal	-0.53	-0.53	-0.54	-0.57	-0.56
Spain	-0.28	-0.27	-0.27	-0.27	-0.28

Measured as: RCA = (exports – imports) / (exports + imports).

Source: Eurostat, WIIW calculations.

Table 16

Relative position of chemical sector RCAs

	1995	1996	1997	1998	1999
Bulgaria	0.10	0.12	0.10	-0.10	-0.26
Czech Republic	-0.13	-0.16	-0.23	-0.32	-0.38
Hungary	-0.21	-0.31	-0.32	-0.38	-0.47
Poland	-0.28	-0.29	-0.29	-0.30	-0.39
Romania	-0.19	-0.22	-0.30	-0.39	-0.55
Slovak Republic	0.00	-0.03	-0.06	-0.17	-0.30
Slovenia	-0.38	-0.38	-0.37	-0.37	-0.32
Greece	-0.26	-0.29	-0.26	-0.22	-0.18
Portugal	-0.32	-0.34	-0.32	-0.33	-0.31
Spain	-0.14	-0.14	-0.13	-0.12	-0.09

Measured as: RCA (sector) – RCA (total manufacturing).

Source: Eurostat, WIIW calculations

Table 17

Detailed RCA structure of the chemical sector, 1999

		Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
24.1	Basic chemicals	0.30	0.08	0.03	-0.25	-0.07	0.18	-0.15
24.2	Pesticides and other agro-chemical products	-0.86	-0.76	-0.79	-0.93	-0.79	-0.75	-0.55
24.3	Paints, varnishes and similar coatings	-1.00	-0.87	-0.94	-0.98	-1.00	-0.98	-0.90
24.4	Pharmaceuticals	-0.68	-0.78	-0.66	-0.95	-0.86	-0.85	-0.70
24.5	Soap, cleaning, polishing, perfumes & toilet preparations	-0.86	-0.73	-0.86	-0.77	-0.97	-0.79	-0.85
24.6	Other chemical products	-0.81	-0.79	-0.77	-0.90	-0.94	-0.67	-0.77
24.7	Man-made fibres	0.37	0.12	-0.10	0.26	0.50	0.86	0.46
DG	**Chemicals, chemical products and man-made fibres**	**-0.35**	**-0.42**	**-0.45**	**-0.63**	**-0.58**	**-0.25**	**-0.43**

Source: Eurostat, WIIW calculations.

4 Foreign direct investment

In all countries the chemical sector is among the most attractive sectors for foreign investors. The latter have been mainly motivated by market-seeking considerations; in some sub-branches follow-the-leader strategies have been pursued (for instance, in the sub-sector of 'soap, cleaning, polishing, perfumes & toilet preparation', Unilever, Procter & Gamble and Colgate-Palmolive Co. pioneered on the market, other companies followed)[16]. As labour costs account for less than one-fifth of total costs on average, low labour costs have probably not been a main motive for foreign investors. Foreign direct investment is strong in industrial gases, detergents, paints, and pharmaceuticals. Foreign investors bring in know-how and capital, helping companies move towards compliance with the regulatory requirements of the EU. Nevertheless, the restructuring of the sector is apparently not yet completed (see pp. 5ff).

Looking at the shares of the chemical sector in the *distribution* of nominal capital of foreign investment enterprises (FIEs)[17] in total manufacturing, shares were relatively large, ranging between 7% in the Czech Republic and 11% in Hungary in 1999. Compared to other sectors in manufacturing, the chemical sector held a relatively important position in the Czech Republic and in Slovenia and was very important in Hungary and Poland. Shares remained quite constant in most countries during the time period observed, only in the case of Slovakia and Slovenia they were somewhat decreasing in the past few years (see Figure 7).[18]

Foreign *penetration* of the chemical sector (as measured by the share of nominal capital of the sector's FIEs in the nominal capital of all chemical companies) was above the levels of foreign penetration for total manufacturing only in Hungary and Poland in the last few years. In most countries it increased slightly between 1997 and 1999 (see Figure 7). In 1999, foreign penetration reached 22% in Slovenia, 26% in the Czech Republic, 51% in Poland and 83% in Hungary.

[16] See Alessandrini (2000), p. 54.

[17] Firms with any share of foreign ownership, including minority stakes.

[18] It should be kept in mind that shares in the Slovak Republic include the coke and petroleum sector and are for the years 1994, 1995 and 1996. As this sector was owned domestically then, this share may reflect the real percentages for the chemical sector.

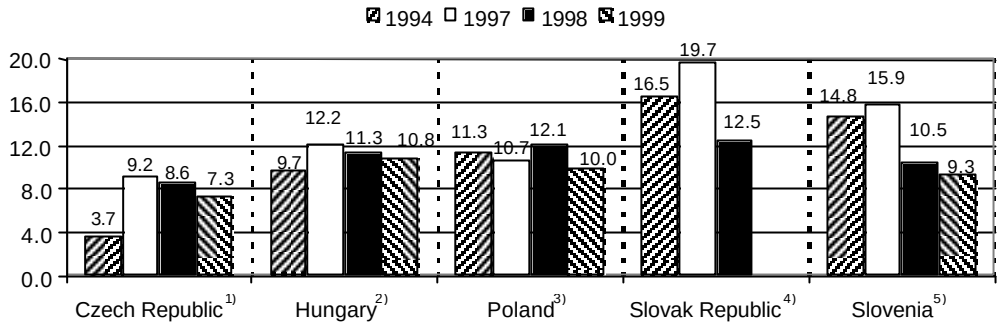
Figure 7

Chemicals, chemical products and man-made fibres

A. Position of the sector in the distribution of foreign capital

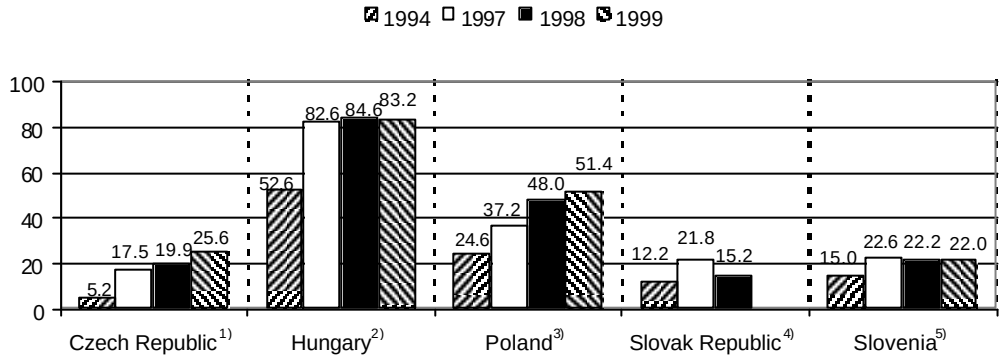
Percentage share of the sector in total manufacturing's nominal capital of foreign investment enterprises (FIEs)

Manufacturing = 100



B. Foreign penetration of the sector

Share of nominal capital of leather FIEs in the nominal capital of all leather companies (FIEs + all others)



Notes: 1) 1994 own capital, 1997-1999 equity capital. - 2) Nominal capital. - 3) Equity capital. - 4) Output of companies; 1995 data instead of 1997, 1996 data instead of 1998, 23+24 Coke and petroleum + chemicals. - 5) Nominal capital; 1995 data instead of 1994.

Source: WIIW, FIE Database.

5 Prospects

Generally, the chemical sector has turned from a priority sector during communism into a **problematic, declining sector** during transformation: its importance in the region fell in terms of production and employment shares, growth performance was weak over the whole transformation period, and the sector became a 'productivity loser'. Together with declining cost advantages, these developments point to a less successful restructuring of the chemical sector than of manufacturing in general. Restructuring seems to be hampered by the sector's inherent characteristics: high capital intensity, large companies difficult to privatize, restructure and modernize and often troubled by soaring debts and ecological burdens. Although FDI is important, it reaches only certain sub-branches of the sector.

In terms of trade performance, recent developments in the chemical sector are also rather worrying and point to declining competitiveness: **exports are less oriented towards the EU(15) markets** than total manufacturing exports. Export growth to the EU(15) is less dynamic than in other branches, and the export structure is dominated by basic chemicals, partly explaining the relatively large negative and persistent export price gap. The position on the EU market is weak and deteriorating, and trade deficits are increasing.

There are only two exceptions to this pattern in the CEEC(7) – the chemical sector in ***Slovenia*** and to a lesser extent also in ***Bulgaria***. In both countries the chemical sector still holds a prominent position and has displayed a better production performance than total manufacturing in the second transition period. However, major differences exist between these two countries: In Slovenia, production has improved continuously since 1994, favoured by dynamically growing exports to the EU and competitive gains in certain sub-branches (man-made fibres, pharmaceuticals). In Bulgaria, on the other hand, production of the chemical sector peaked in 1996 and fell again thereafter; exports to the EU(15) have declined in real terms, productivity is weak (measured at current prices) and fertilizer consumption is still declining. While restructuring seems to have been completed in the Slovenian chemical sector, it is suffering delays in Bulgaria.

The future prospects of the chemical sector are quite mixed. On the **export markets**, the negative trends on the EU(15) markets in the last few years have persisted, pointing to unfavourable future developments. Quality upgrading of chemical products is essential in order to mitigate a further deterioration and to reach compliance with EU regulations in anticipation of EU accession. On the more important Eastern markets, the growth prospects are better. These are however subject to big uncertainties regarding the overall future economic development of the region. Here too, quality upgrading will be necessary in the long run to withstand competition from West European companies.

On the **domestic market**, growth potentials for the sector still prevail (consumer goods, pharmaceuticals, fertilizer, paints etc.), which are however increasingly challenged by growing imports from the EU(15). Developments in GDP and gross industrial production are currently quite favourable and forecasts are positive for all CEECs in 2001 and 2002 (except Poland). The trends in industrial production are most promising in Hungary, followed by the Czech Republic and Slovakia. The growth rates for Romania, Bulgaria and Slovenia are lower but still pronounced, while those for Poland were markedly scaled down (see most recent WIIW forecasts, Appendix Table A5). For the future, ongoing restructuring, modernization and ecological upgrading has to be pursued – also with the help of FDI – in order to meet international demand and to reach compliance with EU regulations.

Part II: COMPANY PROFILES

This second part presents a more detailed micro-analysis of the chemical sector and contains the following information for each country, as far as available:

- Detailed structure of the sector (3-digit NACE-level)[19]
- Number and size structure of companies
- Profitability and investment / foreign direct investment
- List of major companies[20]
- Description of selected companies / branches (pharmaceuticals)[21]

Bulgaria

The Bulgarian chemical sector was traditionally specialized in bulk chemicals and biological pharmaceuticals (herbal medicines), being a leading producer of the latter under the CMEA specialization agreements. Hence it has developed a particular strength in soda ash and pharmaceutical industries; the country also supplies 70% of the world's rose oil. The privatization process of the chemical sector started in 1997 when Solvay from Belgium bought the Sodi soda ash facility in Devnya, which is the second largest synthetic soda ash producer in the world and a major exporter. By the end of 1999, about 80% of companies were covered by privatization projects. However, the privatization of the financially troubled fertilizer plants proved to be difficult. The Bulgarian chemical sector is a strong exporter.[22]

In the structure of the Bulgarian chemical sector, 'other chemicals' accounted for almost 50% of the sector's gross output in 1998, followed by 'basic chemicals' with 42%. 'Man-made fibres' was only a small sub-branch, with 8% (see Table 18).

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[19] Special attention should be paid to the definition of production statistics comprising enterprises with differing numbers of employees.

[20] The distinction between the chemical sector and the sector of 'coke, refined petroleum products and nuclear fuel' is sometimes difficult to make: for example, refineries are often also engaged in down-stream processes, classified in the chemical sector. In the list of major companies, however, the largest refineries were left out on purpose. These include: Lukoil-Neftochim in Bulgaria; Ceská Rafinérská a.s., Litvínov in the Czech Republic; MOL in Hungary; Orlen Polski Koncern Naftowy SA, Plock and Rafineria Gdanska SA, Gdansk in Poland; Rompetrol Rafinarie – Complexul Petromidia SA in Romania; Slofnaft in Slovakia; and Petrol in Slovenia.

In addition, difficulties were encountered in the classification of the companies Procter & Gamble and Unilever, as they produce a wide variety of goods (diapers, tissues and towels, food & beverage, cosmetics, household cleaning, health care etc.) and only some of them are produced in the CEECs. Often the published lists differed in their classification (e.g. as consumer goods).

[21] The presentation of companies is restricted to a few company examples and can never be complete.

[22] European Commission (2000), p. IV-10.

Table 18

Bulgaria: Gross output of the chemical sector

BGL million[1)], distribution in %

ISIC rev. 3		1997	1998	1998 in %
241	Basic chemicals	858486	585935	42.2
242	Other chemicals	647116	691432	49.8
243	Man-made fibres	127982	110902	8.0
DG	**Chemicals, chemical products and man-made fibres**	**1633584**	**1388269**	**100.0**

Notes: ISIC rev. 3 classification system. 241 includes basic chemicals, except fertilizers (2411), fertilizers and nitrogen compounds (2412), plastics in primary forms, synthetic rubber (2413); 242 includes pesticides and other agro-chemical products (2421), paints, varnishes, printing ink and mastics (2422), pharmaceuticals, medical chemicals etc. (2423), soap, cleaning & cosmetic preparations (2424), other chemical products n.e.c. (2429). - 1) Before denomination 1999. Average exchange rate Bulgarian lev 1997 BGL/EUR 1895.81 and 1998 1972.26.

Source: UNIDO (2001).

Table 19

The largest Bulgarian chemical companies, ranked by 2000 net sales

Name, location	Net sales in ths. BGN	Net sales in ths. EUR[1)]	Employees	Sub-branch
Solvay-Sodi, Devnia*	195,702	100,052	1,286	Inorganic basic chemicals
Agropolihim, Devnia*	159,885	81,741	309	Artificial fertilizers and pesticides
Neohim, Dimitrovgrad*	117,719	60,184	1,600	Artificial fertilizers and pesticides
Balkanpharma-Dupnitsa (Pharmacy), Dupnitza*	92,850	47,469	1,966	Drugs and chemical pharmaceutical preparations
Sviloza, Svishtov*	87,701	44,837	2,300	Man-made fibres
Chimco, Vratza*	87,197	44,579	1,318	Artificial fertilizers and pesticides
Sopharma, Sofia	73,507	37,580	1,607	Drugs and chemical pharmaceutical preparations
Alen mak, Plovdiv	51,617	26,389	1,293	Perfumes and cosmetics
Balkanpharma-Razgrad (Antibiotic), Razgrad*	49,541	25,328	1,650	Drugs and chemical pharmaceutical preparations
Biovet, Peshtera	44,802	22,905	1,191	Drugs and chemical pharmaceutical preparations

Notes: 1) Converted with average exchange rate Bulgarian lev 2000 BGN/EUR 1.956.- *) Companies with foreign investment, see List of Privatization Transactions with Foreign Investors 1993-2000 at www.priv.government.bg/ap/rograms_and_reports/soldsince93.html.

Source: Bulgarian Enterprises Information System BEIS (wwwbia-bg.com).

Today, foreign direct investment in the Bulgarian chemical industry plays an important role: together with the petroleum and the rubber & plastic industry the chemical sector was the largest recipient of FDI in manufacturing between 1998 and 2000. Out of the ten largest companies, seven have received foreign direct investment (see Table 19); a potential

investor pulled out of the purchase of Biovet possibly due to the war in the Balkans.[23] The largest foreign direct investors include France Arne, Solvay (Belgium) and Whitebeam Holding Ltd. (USA) and in pharmacy Bioland (France) and Deutsche Bank.

- Agropolihim: The largest Bulgarian fertilizer plant was one of the biggest lossmakers in Bulgaria, with massive debts especially to the gas monopoly Bulgargas. At the beginning of 1999, Norsk *Hydro* from Norway stepped back from a deal to buy the heavily indebted company.[24] The company had to stop production and declared insolvency. In October, two of the biggest creditors bought the company (a consortium between Union Mnière from Belgium and Hardland Investments from the US) and started an investment and modernization programme in 2000.[25]

Czech Republic

In 1990, the Czech Republic accounted for about 62% of production of the former Czechoslovak chemical and rubber & plastic products sector. In the structure of the Czech chemical sector in the year 2000, 'basic chemicals' accounted for the largest share of sales revenues, holding 64%. 'Pharmaceuticals', 'soap, cleaning, polishing, perfumes & toilet preparations' and 'man-made fibres' accounted for some 10%, the other sub-branches were relatively smaller (see Table 20). A favourable development over the whole period 1994 to 1999 was registered only for 'soap, cleaning, polishing, perfumes & toilet preparations' and from 1995 on in 'paints, varnishes and similar coatings'. All other sub-branches experienced stagnation or a decline in some period.[26]

The individual sub-branches can be characterized as follows.[27]

- The sub-branch of 'basic chemicals' (24.1), which includes the manufacture of industrial gases, dyes and pigments, other inorganic and organic basic chemicals, fertilizers and plastics and synthetic rubber in primary forms, currently undergoes basic restructuring and modernization and has received some foreign direct investment so far.
- The sub-branch of 'manufacture of pesticides and other agro-chemical products' (24.2) has been selected for phasing down.
- The sub-branch of 'paints, varnishes and similar coatings' (24.3) is less developed and shows a low intensity of foreign trade exchange.
- The sub-branch of 'pharmaceuticals' (24.4) shows a trade deficit and has also received some FDI.

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[23] See *Business Eastern Europe* (1999), 10 May.

[24] *Business Eastern Europe* (1999), 28 June.

[25] See also the Internet Homepage of the Privatization Agency – Bulgaria www.priv.government.bg/ap/sucess_stories/acq_rst.html.

[26] See Ministry of Industry and Trade (2001), p. 253.

[27] ibid.

- In the sub-branch of 'soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations' (24.5), foreign investment by Procter & Gamble contributes to high exports.
- The sub-branch of 'man-made fibres' (25.7) has been selected for phasing down; viscose staple production has been terminated. The lack of developed domestic production in this field leads to high import requirements.

In 1999, there were 150 companies with more than 20 employees in the Czech chemical sector, of which 45% employed more than 100 persons (eight companies had more than 1000 employees). A decisive role is played by large companies with more than 1000 employees: they accounted for 56% of the sector's sales and almost 55% of value added in 1999.[28] Privatization of the chemical sector is not completed yet, but entered its final stage at the end of 2000.

The sector is among the most investment-intensive branches of manufacturing and received a relatively large amount of investment: in 2000, investment outlays totalled about EUR 270 million, representing 8% of total manufacturing investment. While investment increased above average between 1999 and 2000 (by one third due to the construction of petrochemical capacities), it had registered a heavy slide the year before.[29] Expenditures need to be channelled mostly into ecological investments (e.g. removal of old ecological burdens, adaptation to strict EU ecological standards) and hence availability is limited for modernization and production restructuring.[30] Among the 'Top 50' foreign investors in the chemical sector are Linde AG (Germany, technical gases), E.M. Warburg Pincus & Co. (USA, pharmaceuticals, investment in Léciva), Procter & Gamble (USA, consumer goods), AGA Gas (Austria, industrial gases), Ivax Corporation (USA, pharmaceuticals, stake in Galena), and Cabot International (USA, invested in the carbon black production at the Deza works).[31] The chemical sector registered pre-tax profits in the last few years and lay in the middle-field of manufacturing branches, with EUR 92 million in 2000.[32]

[28] Ministry of Industry and Trade (2001), p. 246.

[29] Ministry of Industry and Trade (2001a), p. 102.

[30] Ministry of Industry and Trade (2000), p. 196.

[31] *Prague Business Journal* (2000), p. 94.

[32] Data including firms with 100 or more employees. See Ministry of Industry and Trade (2001a), p. 172.

Table 20

Czech Republic: Sales revenues of the chemical sector

CZK million, distribution in %

		1994	1999	2000[1)]	2000	1999 level
		CZK million			in %	in % of 1994
24.1	Manufacture of basic chemicals	80869	61471	74891	64.2	76.0
24.2	Manufacture of pesticides and other agro-chemical products	443	779	938	0.8	175.9
24.3	Manufacture of paints, varnishes and similar coatings	2238	3862	4152	3.6	172.6
24.4	Manufacture of pharmaceuticals	8588	12098	13953	12.0	140.9
24.5	Manufacture of soap, cleaning, polishing, perfumes & toilet preparations	5003	11429	11621	10.0	228.5
24.6+24.7	Manufacture of other chemical products and man-made fibres	5708	8605	11116	9.5	150.8
DG	**Chemicals, chemical products and man-made fibres**	**102849**	**98245**	**116670**	**100.0**	**95.5**

Notes: Average exchange rate Czech koruna 1999 CZK/EUR 36.88; 2000 CZK/EUR 35.61. - 1) Estimate.

Source: Ministry of Industry and Trade (2001).

Table 21

The largest Czech chemical companies, ranked by 1999 net sales

Name, location	Net sales in mn CZK	Net sales in mn EUR[1)]	Employees	Sub-branch
Chemopetrol, a.s., Litvínov	19,815	537	3,253	Petrochemicals, plastics, industrial fetilizers, nitrogen compounds
AliaChem, a.s., Praha	11,961	324	7,800	Holding
Procter & Gamble - Rakona, a.s., Rakovník	9,220	250	750	Detergents
Spolana, a.s., Neratovice	8,778	238	2,000	Petrochemicals
Agrofert Holding, a.s., Praha	6,604	179	28	Agricultural chemicals
Spolchemie, a.s., Ústí nad Labem	5,382	146	1,500	Inorganic chemistry, synthetic resins, organic dyes
Léc iva, a.s., Praha	5,311	144	1,164	Pharmaceuticals

Notes: 1) Converted with average exchange rate Czech koruna 1999 CZK/EUR 36.88.

Source: Prague Business Journal (2000).

– Chemapol Group a.s.: Formerly the monopoly foreign trading company for chemicals, Chemapol Group began manufacturing its own products after the collapse of communism and acquired major stakes in other chemical companies, thus becoming a major Czech conglomerate. It also went into the newspaper business, defence production, the banking sector and the management of golf courses. In 1996, the group

employed 25,000 people, registered a turnover of CZK 43 billion (EUR 1.3 billion), and a loss of CZK 1.1 billion (EUR 32 million). At the end of 1997 the Group announced a detailed restructuring programme (guided by Austrian managers under the head of Hugo Michael Sekyra) which included the sale of superfluous subsidiaries and the concentration on the core chemical business. The chemical companies were comprised under a single unit called AliaChem, including Synthesia a.s.[33], Spolana a.s.[34], Moravské Chemické Závody a.s. (MCHZ)[35], Fatra a.s.[36] and Technoplast. However, the restructuring plan failed, losses soared, and Chemapol went into bankruptcy in 1999. In the same year, the Croatian Pliva acquired 67% of the pharmaceutical company Lachema, formerly also belonging to the Chemapol Group. In 2000, Hungarian Borsodchem bought MCHZ and in 2001, the government transferred its 82% stake in Spolana to Unipetrol.[37]

– Unipetrol Holding: Unipetrol was established in 1994, with the state as the major shareholder. Over time, Kaucuk, Chemopetrol, Benzina, Paramo, Koramo, Ceská Rafinérská and Unipetrol Trade were integrated into the petrochemical holding Unipetrol.[38] According to the 1998 ranking of the 'Top 100' companies, Unipetrol ranked third, with revenues of CZK 50 billion (EUR 1.4 billion) and 10,500 employees.[39] In 1999, Unipetrol approved investments by Chemopetrol to upgrade ethylene and polyethylene production and to construct a new polypropylene unit. These three projects were said to be the largest investment into the chemical industry since 1989.[40] At the beginning of 2001, the government announced the sale of its 63% stake in Unipetrol.

Hungary

In the structure of the Hungarian chemical sector, two sub-branches dominated gross output in 1999: 'basic chemicals' with 46% and 'pharmaceuticals' with 37%. All other sub-branches were rather small and held shares between 1% and 8% (see Table 22). Generally, the export orientation of the chemical sector was slightly lower than that of total

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[33] Synthesia was the fourth largest Czech chemicals company according to 1997 revenues; it employed 6,200 people and exported 55% of sales then. See *The Prague Post* (1998), 18-24 March.

[34] Spolana produced fibres and plastics then and was the second largest chemical company in the Czech Republic, employing 3,500 persons and exporting 74% of sales by 1997. Production of staple fibres were terminated in Spolana later on.

[35] MCHZ produced organic chemicals and was the leading European producer of aniline; it exported 78% of sales.

[36] Fatra produced plastics.

[37] *Business Eastern Europe* (2001), 21 May.

[38] See Unipetrol Internet Homepage www.unipetrol.cz.

[39] *Prague Business Journal* (1999). Total sales reached about CZK 80 billion (EUR 2.2 billion) in 2000, employment stood at 6,612 at the end of 2000. See Unipetrol Internet Homepage www.unipetrol.cz.

[40] *NewsBase CEBD* (1999(), 19 October.

Table 22

Hungary: Gross output, total sales and export sales in the chemical sector

Code[1]		Gross output		Total sales	Export sales		Export sales/ Total sales	Gross output
		1999 HUF mn	1999 in %	1999 HUF mn	1999 HUF mn	EUR mn	1999 in %	1999 level in % of 1993[2]
24.1	Manufacture of basic chemicals	253830	45.7	252866	131993	522	52.2	371
24.2	Manufacture of pesticides and other agro-chemical products	5634	1.0	5111	2568	10	50.2	38
24.3	Manufacture of paints, varnishes and similar coatings	26194	4.7	26161	1544	6	5.9	285
24.4	Manufacture of pharmaceuticals	203459	36.6	200301	115486	457	57.7	285
24.5	Manufacture of soap, cleaning, polishing, perfumes & toilet preparations	41935	7.5	41580	12095	48	29.1	369
24.6	Manufacture of other chemical products	13912	2.5	13747	5385	21	39.2	176
24.7	Manufacture of man-made fibres	11018	2.0	11027	7046	28	63.9	230
DG	**Chemicals, chemical products and man-made fibres**	**555983**	**100.0**	**550793**	**276116**	**1092**	**50.1**	**296**
D	**TOTAL MANUFACTURING**	**7886728**	**.**	**7852234**	**4478972**	**17717**	**57.0**	**458**

Notes: Average exchange rate Hungarian forint 1999 HUF/EUR 252.80.
Data of companies with 5 or more employees.
1) TEAOR'98 (Standard Industrial Classification of All Economic Activities) was introduced on 1 January 1998.
2) 1993 data include only companies with 20 or more employees.
Source: Yearbook of Industrial and Construction Statistics Hungary (2000).

manufacturing, with 50% of total sales being exported in the former sector and 57% in the latter. Above-average export quotas were achieved in 'man-made fibres' and 'pharmaceuticals', while exports were very low in 'paints, varnishes and similar coatings' (see Table 22). Between 1993 and 1999, the chemical sector grew less than total manufacturing, especially due to a decline in the output of 'pesticides and other agro-chemical products' and also 'other chemical products'. Growth in the sector was most vigorous in 'basic chemicals' and 'soap, cleaning, polishing, perfumes & toilet preparations', although it also lay below total manufacturing growth. Foreign direct investment targeted paints and coatings, detergents, fibres and pharmaceuticals.

At the end of 1999, there were about 560 companies with legal entity active in the Hungarian chemical sector, representing 2.5% of all manufacturing operations in the country. Of these, 64% had less than 20 employees, 31% employed between 10 and 249 persons, and 5% had more than 250 employees. In terms of legal form, 87% of all active corporations were private limited companies and about 10% were public limited companies.[41]

Table 23

The largest companies of the Hungarian chemical sector, ranked by 2000 net sales

Name	Net sales in HUF mn	Net sales in EUR[1] mn	Employees	Export Share	Main activity
Tiszai Vegyi Kombinát Rt. (TVK)	156,835	603	2,587	49	.[2]
BorsodChem Rt.	110,347	424	4,020	80	.[2]
Richter Gedeon Vegyészeti Gyár Rt.	74,656	287	4,798	73	Pharmaceuticals
Unilever Magyarország Kft.	62,582	241	1,492	21	Detergents, food etc.
Egis Gyógyszergyár Rt.	45,516	175	2,729	63	Pharmaceuticals
Chinoin Gyógyszer és Vegyészeti Termékek Gyárta Rt.	42,735	164	1,608	66	Pharmaceuticals
Henkel Magyarország Kft.	40,968	158	866	33	Detergents
Biogal Gyógyszergyár Rt.	36,233	139	925[3]	66	Pharmaceuticals
Dunastyr Polisztirolgyártó Rt.	25,388	98	139	68	Polystyrene
Nitrogénmüvek Rt.	24,616	95	1,366	20	Ammonium nitrate

Notes: 1) Converted with average exchange rate Hungarian forint 2000 HUF/EUR 260.04. - 2) Together with MOL these two companies dominate the Hungarian petrochemicals and polymer sector. - 3) 1999.

Source: Figyelö TOP 200 (2001), October.

Important Hungarian chemical companies include:

– Tiszai Vegyi Kombinát Rt. (Tisza Chemical Works)/TVK: Founded in 1953 by governmental decree, TVK today is the largest chemical complex and sole polyolefines producer in Hungary, manufacturing ethylene, propylene, polyethylene and

41 Hungarian Central Statistical Office (2000).

polypropylene from naphtha and gas oil. It comprises a group of more than 30 companies.[42] Under communism, the company held a privileged position within the Hungarian economy: it was a major exporter to the West, it had up-to-date technologies and a noticeable share of world output. TVK was present in three sub-branches of the industry then, including fertilizers, plastics & chemical fibres, and plastics processing.[43] In 1991, it was transformed into a company limited by shares, with the state holding 100%. The company was hit hard by the agricultural crisis, which forced TVK to phase out their fertilizer production line in the mid-1990s. The overall economic recession, tougher competitive pressures from low-cost, small plastics producers, the world-wide depression on petrochemicals and plastics markets and the uncertainty over the delivery of oil imports from Russia also affected the company adversely. In 1994 the management implemented several measures to stabilize the company's financial situation. In 1995 a thorough organizational restructuring and privatization programme followed. At the end of 1999 another restructuring programme was unveiled destined to shed or outsource non-core and non-profitable business.[44] As a result, plastics-units were sold and the focus laid on the petro-chemical business.[45] After MOL and Borsodchem acquired stakes in TVK in 1999/2000 (20% and 28.5% respectively), a wrangling over the ownership structure of the Hungarian chemical companies TVK and Borsodchem started, with major participants being MOL, the Russian Gazprom, and recently the Austrian CE Oil & Gas.[46]

– Borsodchem Rt.: Founded in 1949, Borsodchem is the largest producer of PVC in Central Europe and the only MDI (Methylene Diphenyl Diisocyanate) producer. In addition to its core business, it has subsidies in plastics processing, technical services, catering and other services for employees. Borsodchem has commercial offices in Vienna, Katowice and Milan. In 1991, the company was transformed into a company limited by shares, in March 1996 it was listed on the Budapest and London stock exchanges. In the meantime, a restructuring process entailed the ceasing of certain activities (production of fertilizers), the transfer of some activities into joint ventures (crop protection agents) and the sale of others (industrial gases).[47] Today Borsodchem is a modern, well-arranged and profitable company. Exports accounted for 80% of sales in 2000; Western Europe had a share of 48% of exports, the CEECs together with the domestic market another 48%. In February 1997, Borsodchem formed a joint venture

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42 See TVK Internet Homepage www.tvk.hu.

43 See Estrin et al. (1995), p. 174. These sub-branches possessed an oligopolistic and segmented structure. In 1990, there were twenty domestic fertilizer manufacturers including four big ones; sixteen producers of plastics and chemical fibres, including two big ones; and more than 300 plastics processing companies, including only one big company (defined as having sales above HUF 5 billion).

44 *Business Eastern Europe* (1999), 15 November.

45 *Business Eastern Europe* (2001), 12 March and 14 May.

46 See for example *Business Eastern Europe* (2001), 25 June.

47 Borsodchem Internet Homepage www.borsodchem.hu.

with the Austrian Krems Chemie, to build a formaldehyde plant, starting production in 1998.[48] In 2000, the acquisition of the Czech Moravské Chemické Závody (MCHZ), subsidiary of Aliachem, secured safe supply of aniline, which is the raw material for MDI. The acquisition of 28.5% in TVK in the same year was in the interest of stable supply of ethylene.

The Hungarian *pharmaceutical industry* has a tradition of more than 100 years and has been strongest in Central Europe during the communist regime. It is a dominant part of Hungarian chemical industry, accounting for 37% of the sector's gross output in 1999, and one of the most competitive branches of the Hungarian industry. After the collapse of communism, the pharmaceutical industry was hit by the loss of the former CMEA market and by strong import competition. On the export side, successor states of the former Soviet Union and CEECs remain the main export markets, with Russia, Poland, Ukraine, the Czech Republic and Slovakia being the most important ones.[49] The Russian crisis in 1998 dealt a heavy blow to the export-oriented pharmaceutical industry. On the import side, strong competition from international companies started with the liberalization of imports. In 1990, the domestic pharmaceutical industry still held a market share of 74%, which decreased to 44% in 1996, 43% in 1997 and 40% in 1998 – although demand was growing significantly. The majority of imports come from EU countries.

The privatization of the largest Hungarian pharmaceutical companies took place between 1991 and 1996, with strong participation of foreign investors. Today there are seven main producers (see also Table 23), which are all in majority foreign ownership, except for Richter Gedeon, which is however again 60% owned by foreign financial investors. Sanofi (France) has invested in Chinoin, Servier (France) in Egis, TEVA (Israel) in Biogal, Novopharm (Canada) in Human, ICN Pharmaceuticals (USA) in Alkaloida (now named ICN Hungary) and Bristol-Myers Squibb (USA) in Pharmavit. Three companies, Richter Gedeon, Egis and Human, are listed on the Hungarian stock exchange.[50] The Hungarian pharmaceutical industry is well supplied with capital – which is, however, in an international comparison, not sufficient for the innovation needed to market products in the advanced industrial countries.

Poland

In the Polish chemical sector, the 'manufacture of basic chemicals' is the largest sub-branch, accounting for 43% of total sold production in 1999, followed by 'soap, cleaning, polishing, perfumes & toilet preparations' (24%) and 'pharmaceuticals' (17%). The other

[48] Eastbrokers Company Information (1997), 11 August and *New Europe* (1998), 11-17 October.

[49] These countries accounted for nearly one third of total exports in 1998. See Hungarian Ministry of Economic Affairs (2000c), p. 3.

[50] For detailed information on each company see Hungarian Ministry of Economic Affairs (2000c).

branches are relatively small (see Table 24). Growth has been especially pronounced in the sub-branch 'soap, cleaning, polishing, perfumes & toilet preparations' (cleaning preparations, cosmetics), due to strong export expansion. (About 75% of all cosmetics exports and 78% of all cleaning preparations go to the countries of Eastern Europe.)

Looking at the company structure, about 3240 chemical companies were operating in Poland. Of these, 71% employed less than 5 persons, about 23% between 6 and 100 employees and 6% more than 100 employees. Despite this dominance of small enterprises, large companies do play a major role in the sector, many employees work in large enterprises (see Table 26) and production concentration is high. About 98% of chemical companies are in private property, only 2% are still in public property.[51] (However, these are mostly large companies, compare Table 26, where out of the ten largest companies seven are still in state ownership.)

Table 24

Poland: Sold production of the chemical sector[1)]

PLN million, distribution in %

		1994	1996	1999	1999	1999 level
		PLN million			in %	in % of 1994
24.1	Manufacture of basic chemicals	5063	8303	9296	42.6	183.6
24.2	Manufacture of pesticides and other agro-chemical products	211	325	.[2)]	.[3)]	.
24.3	Manufacture of paints, varnishes and similar coatings	723	1186	1433	6.6	198.2
24.4	Manufacture of pharmaceuticals	1751	2740	3725	17.1	212.7
24.5	Manufacture of soap, cleaning, polishing, perfumes & toilet preparations	1242	2795	5136	23.6	413.5
24.6	Manufacture of other chemical products	380	682	.[2)]	.[3)]	.
24.7	Manufacture of man-made fibres	733	1017	933	4.3	127.3
DG	**Chemicals, chemical products and man-made fibres**	**10102**	**17049**	**21800**	**100.0**	**215.8**

Notes: Average exchange rate Polish zloty 1996 PLN/EUR 3.38, 1999 PLN/EUR 4.23. - 1) Companies with more than 50 employees. - 2) Not included in official data any more. - 3) 242 and 246 together account for 6% of sold production.

Source: Polish Statistical Yearbook, Polish Industrial Yearbook, various issues.

In the chemical sector, the financial standing of companies is very good: net profitability was higher than of total manufacturing over the whole period observed (1994 to 2000). Investment activity varied over time but was positive, except in 1999 (see Table 25).[52] Foreign direct investment is also very important for the sector: according to PAIZ, the chemical sector accounted for 6.6% of all capital investment in manufacturing as of

[51] PAIZ (2001), p. 6.

[52] Investment was mostly involved in the modernization of technological processes and installations, with the aim of reducing the energy intensity and material intensity of production, of improving product quality and of reducing environmental hazard. See PAIZ (2001), p. 12.

end-2000 (7.5% as of end-1999).[53] FDI was mainly attracted by the sub-branches of household chemistry, paints and varnishes, pharmaceuticals, and industrial gases and included the following companies:[54]

NACE	Sub-branch	Company
24.11	Industrial gases	BOC Group, Linde AG, AGA AB, Liquid Carbonic
24.3	Paints and varnishes	Alcro-Beckers AB, Kalon Group BV, Omicron BV, Dyrup
24.4	Pharmaceuticals	Glaxo Wellcome, Pliva, ICN Pharmaceuticals, Solco Basel, Bayer AG, Novartis, Novo Nordis A/S, BASF AG, Gerresheimer, Lek d.d. Ljubljana, US Pharmacia, L. Molteni & C. Dai Filli Alitti, Martin Bauer, Schwartz Pharma, Byk Gulden
24.5	Soap & detergents, cleaning & polishing preparations	Cussons Group Ltd., Beiersdorf, Unilever, Orifame, Henkel, L'Oreal, Colgate Palmolive, Benkiser, Catzy

Table 25

Poland: Net profitability in the enterprise [1)] sector and real growth rates of investment outlays

in %

		Net profitability[2)]				Investment growth			
		1997	1998	1999	2000	1997	1998	1999	2000
24	Chemicals, chemical products and man-made fibres	3.4	1.8	1.6	2.7	58.3	23.2	-11,0	16.2
D	Total manufacturing	2.3	1.2	0.1	0.7	38.2	30.9	1.2	-4.1

Note: 1) Firms with 50 or more employees. - 2) Ratio of net profits to all revenue.

Source: Podkaminer (1998) and Central Statistical Office (1998, 1999, 2000, 2001).

In mid-1999, a sectoral programme for restructuring and development of the Polish chemical sector was instituted, called the 'Big Chemical Synthesis'. One of the targets is the consolidation of the chemical sector (including the rubber and plastic products sector) in order to increase synergy effects.[55]

53 PAIZ Homepage www.paiz.gov.pl.

54 Foreign investors as of end of June 2000. PAIZ (2001).

55 PAIZ (2001), p. 14. Even before, a programme was prepared for 21, mainly large companies, focusing on organic and non-organic half-finished products, fertilizers, sulphur processing and coke-chemistry. The programme envisaged considerable restructuring, modernization and development of the industry by 2005. There was also a project called 'The action programme for the restructuring of the Polish pharmaceutical industry'. See Ministry of Economy (1998), p. 181.

Table 26

Largest companies of the Polish chemical sector, ranked by 2000 revenues

NACE Code[1]	Name, Location	Revenues[2] in PLZ mn	Revenues in EUR[3] mn	Employees	Share of exports[4]	Gross profit, in %	Owner-ship[5]
[6]	Polska Grupa Farmaceutyczna SA, L ódz	2,234	557	694	0.07	-3.65	D
24.51	Unilever Polska SA, Warszawa	1,500	374	2,300	.	.	E, D
24.15	Police Zakl ady Chemiczne SA, Police	1,404	350	4,410	53	0.79	A
24.15	Zakl ady Azotowe Pul awy SA, Pul awy	1,354	338	3,751	40	7.83	A
24.16	Anwil Zakl ady Azotowe, Wl oclowek	1,200	299	1,682	38	7.26	D, A, B
24.14	Zakl ady Azotowe SA, Tarnów -Mos cice	1,107	276	3,705	59	1.99	A
24.15	Zakl ady Azotowe Ke dzierzyn SA, Ke dzierzyn-Koz le	1,042	260	1,978	53	-4.52	A
24.16	Dwory Firma Chemiczna SA, Os wie cim	1,013	253	.	.	0.92	D, A
24.14	Zachem Zakl ady Chemiczne, Bydgoszcz	851	212	2,122	34	1.83	B
24.51	Henkel Polska SA, Warszawa	712	178	706	13	3.28	E, A

Notes: 1) NACE Codes: 24.14 Manufacture of other organic basic chemicals; 24.15 Manufacture of fertilizers and nitrogen compounds; 24.16 Manufacture of plastics in primary forms; 24.51 Manufacture of soap and detergents, cleaning and polishing preparations. - 2) Total revenues. - 3) Preliminary average exchange rate Polish zloty 2000 PLN/EUR 4.01. - 4) As per cent of revenues of main activity. - 5) Ownership defined as State treasury (A), State or state agency (B), communal ownership (C), private ownership (D), foreign ownership (E). - 6) Largest private distributor of pharmaceuticals.

Source: *Rzeczpospolita* (2001).

Under communism, the *Polish pharmaceutical industry* consisted of 13 main companies, all belonging to the industrial amalgamation called Polfa (for herbal medicines, Herbapol). On the domestic market, the production was sold by the intermediary distributor CEFARM (Centrala Farmaceutyczna), on the foreign market this was done by the trade organization Ciech.[56] After the collapse of the socialist system, the companies were intended to be privatized as one concern. However, a first privatization attempt in 1991 failed and a case-by-case privatization approach was adopted. By 1997, only two companies, Polfa Kutno and Jelfa in Jelenia Góra, had been transformed into joint-stock companies, with the state treasury being their main stockholder, which were later listed on the Warsaw stock exchange. Until the end of 1997, foreigners were deliberately kept aside from

[56] Urbanek (1998), p. 84.

pharmaceutical companies, as the pharmaceutical branch was assigned particular importance. Since then, some companies have been privatized, also with foreign strategic investors, and some still await privatization.

As of the first half of 2000, the pharmaceutical industry comprised 267 companies, of which 199 produced basic pharmaceuticals and 68 pharmaceutical preparations. Small companies with up to 5 persons dominate, in addition 27 large companies with more than 250 employees exist. In the structure of 1999 sold production, pharmaceutical substances account for 3%, herbal pharmaceuticals for 11%, auxiliary preparations and semi-products for 5%, ready-made medicaments for 74% and other for 9%. Generic drugs account for 95% of home production. In foreign trade, 66% of pharmaceutical exports were destined for the countries of Eastern Europe (Russia, Lithuania, Ukraine) and only 19% for the EU, while 73% of imports came from the European Union (France, Germany).[57] The largest companies include Pliva Kraków S.A., Polpharma S.A. Starograd Gdanski, Glaxo Wellcome S.A., Polfa Tarchomin S.A., Polfa Kutno S.A., and Jelfa S.A. Jelenia Góra.[58] Four companies (Pliva Kraków, Glaxo Wellcome, Polfa Kutno and Jelfa) have improved their marketing strategies and are successful on the OTC (over-the-counter) market, the other producers still struggle to meet Good Manufacturing Practice (GMP) requirements, introduced by the Polish government in 1997.[59]

Romania

Romania has a historical focus on oil, petrochemicals and basic chemicals due to the availability of indigenous feedstock; a limited range of pharmaceuticals and agro-chemicals is produced as well. In terms of value, fertilizers, petrochemicals/polymers and fibres are important sub-branches.[60] During communism, investment in capacities rather than in quality improvements led to obsolete technology in the sector. Privatization of the chemical sector is still proceeding slowly (e.g. SC Antibiotice) with companies troubled by high debts and by the inability to procure feedstock, which stifles much of the industry.

The aim of the industrial policy today is to increase the competitiveness of the chemical sector by[61]:

- adapting the production to internal and external market demand

[57] The significance of imports can be illustrated by the following figures: Of 12,000 medicines registered in Poland, less than 3000 are Polish-made. Locally produced drugs account for 30% of the market in terms of value, but 75% in terms of all pharmaceuticals purchased. *NewsBase CEBD* (2000), 3 April and *Business Eastern Europe* (2000), 18 December.

[58] For detailed information see PAIZ (2001).

[59] *Business Eastern Europe* (2000), 18 December.

[60] See European Commission (2000), p. IV-77.

[61] Romanian Government (2001), p. 214.

– implementing quality assurance systems for products and manufacturing (e.g. upgrading pharmaceutical manufacturers' production to meet the Good Manufacturing Practice standards)
– Stimulating investments for upgrading and environmental protection (e.g. new efficient technology for caustic soda and chloride production; investments into environmental safety technologies for fertilizers and inorganic chemical industries).

Table 27

The largest Romanian chemical companies, ranked by 1999 turnover

Name, location	Turnover in ROL mn	Turnover in EUR[1] mn	Employees	Sub-branch
Oltchim SA	3137,132	193	7,356	Other basic inorganic chemicals
Azomures SA	1464,284	90	3,628	Fertilizer and nitrogenous products
Procter & Gamble Marketing Romania SRL	1279,667	79	.	Soaps, detergents, cosmetics and perfumery products
Sicomed SA	615,625	38	2,370	Pharmaceutical products
U.S.G. SA (Uzinele Sodice Govorna)	560,196	34	1,982	Other basic inorganic chemicals
Chimcomplex Borzesti SA	542,293	33	2,111	Other basic inorganic chemicals
Carom SA	477,167	29	2,412	Synthetic rubber manufacture
Terapia SA	464,350	28	1,477	Pharmaceutical products
Unilever Romania SA	462,154	28	289	Soaps, detergents, maintaining products
Europharm SA	415,362	25	711	Pharmaceutical products
Antibiotice SA	408,906	25	2,187	Pharmaceutical products

Notes: 1) Converted with average exchange rate Romanian lei 1999 ROL/EUR 16295.3. - Not included were the following companies: Rompetrol Rafinarie – Complexul Petromidia SA (processing of crude oil and derivatives); B.B.G. Alum SA (aluminium production and fabrication of soaps, detergents and maintaining products); Petrotel Lukoil SA (petroleum processing). No 1999 turnover data available for Colgate Palmolive Romania SA (fabrication of soaps, detergents, cosmetics and perfumery products) in this database.

Source: Chamber of Commerce and Industry of Romania and Bucharest (2001).

– Oltchim SA: Founded in 1966, Oltchim is now the largest and most diversified chemicals producer in Romania. It dominates the domestic inorganic, petrochemicals and agro-chemicals markets and is the only Romanian PVC producer. It also has a leading position in pesticides (near-monopoly), caustic soda, oxo-alcholos and petrol. Since 1994, it has undertaken an intensive restructuring and investment programme; its targets for the future include lowering the cost basis, increasing the proportion of value-added products and diversification into agricultural and food-processing companies.[62] Difficulties for the company came from the contraction of the domestic market,

[62] ABN AMRO (1998), March, p. 9.

especially of agriculture, being one of its largest debtors. About 30% of deliveries were paid in products; this situation made Oltchim purchase companies such as a poultry breeding farm and a tin factory.[63] Oltchim is among the largest exporters of the country. In 2000, net profits soared to ROL 33.7 billion (EUR 1.7 million) and turnover increased to ROL 4.6 trillion (EUR 231 million). The company's ownership structure in mid-2000 was as follows: 53.2% State Ownership Fund, 7.9% Financial Investments Company Oltenia, 38.6% small shareholders, and 0.082% company managers.[64] In early 2001, the Canadian Exall Resources bought the majority stake from the state, but failed to make the payment on time. Hence in August the privatization deal was cancelled.[65] A major task would be the restructuring of the company's current USD 190 million debts.

The *Romanian pharmaceutical industry* was formerly weak and dominated by seven domestic producers – Sintofarm, Meduman, Terapia, Biofarm, Antibiotice, Sicomed and Armedica – each specialized in manufacturing certain pharmaceuticals for the almost completely closed Romanian market. After the collapse of communism, competition increased as private firms were established (e.g. Sindan or Labormed) and foreign producers entered the market through direct imports, licensing-in agreements and acquisitions. On the Romanian market, companies' operations have been hampered by the low level of health care expenditure by the state (however, private expenditure is growing though prices are rising) and by delays in the reimbursement system, on the export markets by barriers of GMP standards and the Russian crisis. Terapia is listed on the Bucharest stock exchange.[66]

Slovak Republic

In 1990 Slovakia accounted for about 38% of production of the former Czechoslovak chemical and rubber & plastic products sector. After the collapse of communism, the chemical sector faced strong import competition from foreign firms which offered a wider product range than domestic producers. On the export side, the Czech Republic – as already before the split of Czechoslovakia (1993) – and the EU became the main trading partners. Within the chemical sector, man-made fibres take an important position and appear most competitive.[67] The privatization of chemical companies was still in process at the end of 2000, including for example Duslo Šal'a, Chemolak Smolenice, Plastika Nitra

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63 *Romanian Economic Daily* (1999), 30 July - 1 August.

64 *Romanian Economic Daily* (2000), 26 September.

65 *Bucharest Business Week* (2001), 10 September.

66 Raiffeisen Capital & Investment S.A. (2000).

67 Ministry of Economy of the Slovak Republic (1999), p. 17.

In 1998, the most important sub-branches in terms of employment were basic chemicals, pharmaceuticals and man-made fibres (however, no data for pesticides and other agro-chemical products are included), see UNIDO (2001).

and Slovenský Hodváb Senica.[68] Co-operation with foreign companies resulted in a large number of proposals for company reconstruction projects (e.g. Novácke Chemické Závody, Rhone-Poulenc/Chemlon, Chemolak, Plastika Nitra, Istrochem).

Looking at the company structure, 195 companies were operating in the Slovak chemical sector at the end of 2000, representing 2% of all manufacturing companies. Of these, 5% were under total foreign ownership (below manufacturing average), another 15% in mixed ownership (markedly above manufacturing average). In terms of company size, small companies with less than 20 employees dominated, accounting for 74% of all companies. About 19% of companies had between 20 and 249 employees, and 9% had more than 250 companies (the latter share being especially high compared to total manufacturing), with the number of companies employing more than 1000 persons being particularly pronounced.[69] Foreign direct investment played a major role in the sector, accounting for 11% of the stock of foreign direct investment in total manufacturing at the end of 1999.

Table 28

The largest companies of the Slovak chemical sector, ranked by 2000 net revenues

Name, location	Net revenues in SKK mn	Net revenues in EUR mn[1)]	Employees	Export share	Main activity
Duslo, a.s. Šaľa	8,509	200	3,866	78	Fertilizers
Slovakofarma, a.s., Hlohovec	6,357	149	2,012	73	Pharmaceuticals
Chemko, a.s., Strážske	4,982	117	2,347	75	Rubber chemicals, fertilizers, formaldehyde resins
Chemosvit, a.s., Svit	4,708	111	3,986	68	Packaging films
Novácke Chemické Závody, (NCHZ), a.s., Nováky	4,484	105	2,250	93	Polymers
Nylstar Slovakia, a.s., Humenné	2,792	66	1,120	93	Nylon fibres for textiles
Rhodia Industrial Yarns Slovakia, a.s., Humenné	2,740	64	820	99	Industrial nylon
Slovenský Hodváb, a.s., Senica	2,319	54	1,684	74	Man-made fibres
Henkel Slovensko, s.r.o., Bratislava	2,002	47	240	30	Detergents
Istrochem, a.s., Bratislava	1,680	39	1,343	59	Rubber chemicals, explosives, agro-chemicals
Biotika, a.s., Slovenská Ľupča	1,594	37	1,096	61	Pharmaceuticals
Hoechst-Biotika, a.s., Martin	1,390	33	308	41	Pharmaceuticals

Notes: 1) Average exchange rate Slovak koruna 2000 SKK/EUR 42.59. - 2) 1999. - Not included were the following companies: Slovnaft, a.s., Bratislava (oil refinery); Matador, a.s., Púchov (producer of tyres and other rubber products such as conveyor belts) and Petrochema, a. s., Dubová (refinery and petrochemical production).

Source: Trend Top 200 (2001), October.

[68] *Business Central Europe* (2000), November.

[69] Statistical Office of the Slovak Republic (2000b).

Between 1996 and 1999, the chemical sector (including only companies with 20 and more employees) registered a declining profit before taxation (and even a loss in 1998). In 1999, the profit before taxation reached SKK 70 million (EUR 1.6 million).[70]

- Slovakofarma: Established in 1941, the company is the leading and oldest Slovak pharmaceutical company. In 1992, it was transformed into a joint-stock company with the National Property Fund (FNM) holding 100%. One year later, the first phase of privatization was completed and 19.1% of shares were privatized. Altogether, 19 investment funds and 19,800 citizens of the Czech and Slovak Republics participated. Privatization was completed in 1994 by selling a majority stake to the senior management. Slovakofarma's main activity is the production and sale of various medicines, pharmaceutical substances, chemicals and cosmetics. About one third of sales are realized on the Slovak market, one half in the Czech Republic, further export destinations include 25 countries, with Russia in particular, Germany and Poland being the most important. Pre-tax profits went down in 1997 to SKK 680 million (EUR 18 million) from SKK 960 million (EUR 25 million) in 1996 due to declining Czech demand. In 2000, pre-tax profits stood at SKK 490 million (EUR 11 million). The company is listed on the Bratislava stock exchange. At the beginning of 2001, Slovakofarma announced to lay off 307 workers, blaming the critical situation of the health sector, and particularly the non-payment of receivables from local health administrations, estimated at SKK 673 million (EUR 15 million).[71]

Slovenia

The privatization of the Slovenian chemical sector was completed in 1993. Today the chemical sector is one of the most promising sectors in Slovenian manufacturing. In the years 1999 and 2000, it was the most successful manufacturing sector in terms of net profits, with EUR 77 million and EUR 100 million respectively. (In 2000, the sector held 28% of total manufacturing's net profits.)[72] Also in 1996 and 1997, it was the best performing sector in terms of several profitability indicators. The chemical sector is very active abroad, with the highest share of direct outward investment in total manufacturing. It is a strong exporter, mainly to the Central and Eastern European countries and the successor states of former Yugoslavia.

In the structure of the Slovenian chemical sector, pharmaceuticals play the major role: In 2000, the pharmaceutical industry held around 40% of the chemical sector's total revenues; it also ranked highest in terms of business performance. The pharmaceutical

[70] Statistical Office of the Slovak Republic (2000a), p. 99.

[71] Slovakofarma Internet Homepage www. skovakofarma.sk and *NewsBase CEBD* (2001), 18 January.

[72] *Slovenian Business Report* (2001), Fall.

industry is internationally competitive and comprises the companies Krka, Lek and Bayer Pharma, a joint venture between Lek and Germany's Bayer (see Table 30). Another important sub-branch of the chemical sector is 'basic chemicals' (19%), followed by the somewhat smaller sub-branches of 'paints, varnishes and similar coatings' (11%), 'other chemical products' (10%), 'soap, cleaning, polishing, perfumes & toilet preparations' (9%), and 'man-made fibres' (7%). The production of 'pesticides and other agro-chemical products' (2%) is the smallest sub-branch (see Table 29).

- Krka: Founded in 1954, Krka is among the leading pharmaceutical companies in the CEECs and the largest one in Slovenia, with an income of EUR 320 million and 2,800 employees in 2000 (see Table 30). The company's main activities are the development, production and marketing of drugs (90%), comprising mainly generics, OTC-products, but also a small amount of veterinary products. This activity is complemented by the production of cosmetics. Krka is a very export-oriented company, with 70% of sales abroad. In 2000, it was the fourth largest Slovenian exporting company, behind Revoz (automobiles), Gorenje (white goods producer) and Prevent (carseat covers). The company's sales strategy is directed towards five equally important geographical markets: Slovenia, CEFTA, former-Yugoslavia successor states, former Soviet Union and the rest of the world. Principle target markets include Russia, Poland and Croatia. Krka's success is due to 35 companies and representative offices abroad. In the Ukrainian market, for example, it ranked third among foreign pharmaceutical companies according to distributors, behind Hungary's Richter Gedeon and Germany's Berlin's Chemie. At the end of 1997, Krka began the construction of a plant in Warsaw, with a value of USD 15 million (EUR 13 million), which will work at full capacity from autumn 2001 onwards. Krka wants to avoid high customs, to benefit from local tax concessions and to use the plant as an export base for Lithuania and Ukraine. In 2001, a new production facility is yet to open in Slovenia, further plants in Croatia and Russia will follow. In 1999, Krka enjoyed the second largest net profits in Slovenia, behind Telekom, measuring EUR 19 million. In 2000, it was already the largest Slovenian profit-making company (EUR 35 million), followed by Lek (EUR 27 million) and Telekom Slovenije (EUR 25 million). Krka is listed on the Ljubljana stock exchange.[73]

[73] *Eastbrokers Company Information* (1998), 22 January; *Slovenian Business Report* (1997), Autumn; Krka Internet Homepage www.krka.si; *Slovenia Business Week* (2001), 5 February; *Ost-West-Contact* (2001), no. 4; *Slovenian Business Report* (2001), Fall.

Table 29

Slovenia: Total revenues of the chemical sector

SIT million, distribution in %

	2000	2000 in %
24.1 Manufacture of basic chemicals	63243	19.2
24.2 Manufacture of pesticides and other agro-chemical products	6343	1.9
24.3 Manufacture of paints, varnishes and similar coatings	36990	11.2
24.4 Manufacture of pharmaceuticals	138592	42.1
24.5 Manufacture of soap, cleaning, polishing, perfumes & toilet preparations	28304	8.6
24.6 Manufacture of other chemical products	33348	10.1
24.7 Manufacture of man-made fibres	22117	6.7
DG Chemicals, chemical products and man-made fibres	**328937**	**100.0**

Notes: Average exchange rate Slovenian tolar 2000 SIT/EUR 205.03.

Source: Chemical and Rubber Industry Association http://www.gzs.si/eng/ccis/branch/chemical/chem4.htm.

Table 30

The largest companies of the Slovenian chemical sector, ranked by 2000 income

Name, location	Total income in SIT mn	Total income in EUR mn[1)]	Employees	Export Share	Main activity[2)]
Krka, d.d., Novo Mesto	65,629	320	2,775	70	Pharmaceuticals
Lek, d.d., Ljubljana	60,611	296	2,489	60	Pharmaceuticals
Henkel Slovenija, d.o.o., Maribor	18,813	92	579	40-60	24.51
Sava, d.d., Kranj	16,401	80	890	60-80	25.11; 24.66 (second.)
Helios Tovarna Barv, d.o.o., Domž ale	14,935	73	410	60-80	24.30
Color, d.d., Medvode	8,550	42	431	60-80	24.30
Jub, d.d., Dol pri Ljubljani	6,776	33	184	50	24.30
Bayer Pharma, d.o.o, Ljubljana	6,362	31	162	20-40	Pharmaceuticals
Kemiplas, d.o.o., Koper	6,360	31	174	80+	24.14
Belinka Perkemija, d.o.o., Ljubljana	4,527	22	110	80+	24.13

Notes: Julon, d.d., Ljubljana, manufacturer of man-made fibres, was missing from the list of largest companies ranked by2000 income.- 1) Converted with average exchange rate Slovenian tolar 2000 SIT/EUR 205.03. - 2) 24.13 Manufacture of other inorganic basic chemicals; 24.14 Manufacture of other organic basic chemicals; 24.30 Manufacture of paints, varnishes and similar coatings, printing ink and mastics; 24.51 Manufacture of soap and detergents, cleaning and polishing preparations; 24.66 Manufacture of other chemical products n.e.c.; 25.11 Manufacture of rubber tyres and tubes.

Source: *Slovenian Business Report* (2001), Fall; SLO Export Internet Homepage www..gzs.si/sloexporta/default.htm.

– Lek: Formed in 1946, Lek is the second largest Slovenian pharmaceutical company, after Krka, in terms of income, net profits, employees and exports. The company's main activity is the development, production and marketing of drugs, complemented by self-medication products, animal health products, cosmetics and medical devices. Production of active substances and finished products takes place in four branches in Slovenia and a subsidiary in Poland. Slovenia is still the company's largest market,

followed by Poland and Russia, with Croatia and the USA also belonging to its target markets. In 1999, Lek and Sanofi-Synthelabo, the second largest French pharmaceutical company, formed a joint venture in order to market Sanofi's products in the Balkans. One year later, Lek started the construction of a development centre in Ljubljana and in 2001 it acquired 90% of the local antibiotics maker PharmaTech. Lek is listed on the Ljubljana stock exchange and lately considered a London listing, making it easier for foreign investors to buy shares.[74]

[74] Lek Internet Homepage www.lek.si; *Business Eastern Europe* (1999), 20 September; *Business Eastern Europe* (2000), 9 October; *Business Eastern Europe* (2001), 15/22 January.

References

ABN-AMRO*, Report on Central & Eastern Europe and Central Asia,* various issues.

Alessandrini, S. (ed.) (2000), *The EU Foreign Direct Investments in Central and Eastern Europe,* Milan.

ANEIR – Foreign Trade Promotion Center S.A. (2000), *Romania Your Business Partner 1999/2000 Edition,* CD-ROM.

Bucharest Business Week, various issues.

Bulgarian Enterprises Information System BEIS, Internet Homepage www.bia-bg.com.

Bulgarian Privatization Agency, Internet Homepage www.priv.government.bg.

Business Central Europe, various issues.

Business Eastern Europe, various issues.

Chamber of Commerce and Industry of Romania and Bucharest (2001), *Pro Business Romania 2001,* CD-ROM, Internet Homepage www.ccir.ro/pro 2001.

Eastbrokers Company Information, various issues.

Estrin, S. et al. (eds.) (1995), *Restructuring and Privatization in Central and Eastern Europe: Case Studies of Firms in Transition,* M. E. Sharpe.

European Commission (1997), *Panorama der EU-Industrie 97,* Luxemburg.

European Commission (2000), *Competitiveness of the Chemical Industry Sector in the CEE Candidate Countries,* a study prepared by Chem Systems, October, available on the DG III Internet Homepage http://europa.eu.int/comm/enterprise/chemicals/enlargement/competcand/competcand.htm.

Fath, J. et al. (1993), 'Die Industrien Tschechiens und der Slowakei: Profile, Trends, Bezug zu Österreichs Industrie', *WIIW Research Reports*, no. 201, The Vienna Institute for International Economic Studies, September.

Figyelö TOP 200 (2001), Special number, October.

Havlik, P. et al. (2001), 'Transition Countries in 2001: Robust Domestic Demand, Concerns About External Fragility Reappear', *WIIW Research Reports*, no. 277, The Vienna Institute for International Economic Studies, July.

Havlik, P., M. Landesmann and R. Stehrer (2001), 'Competitiveness of CEE Industries: Evidence from Foreign Trade Specialization and Quality Indicators', *WIIW Research Reports*, no. 278, The Vienna Institute for International Economic Studies, July.

Havlik, P. (2001), 'Patterns of Catching-Up in Candidate Countries' Manufacturing Industry', *WIIW Research Reports*, no. 279, The Vienna Institute for International Economic Studies, August.

Hungarian Central Statistical Office (2000), *Statistical Yearbook of Industry and Construction 1999,* Budapest.

Hungarian Ministry of Economic Affairs (2000a), *Plastic Base Materials Production and Plastic Processing,* on the Internet Homepage www.ikm.iif.hu/english/economy/industr/muanyag.htm, January.

Hungarian Ministry of Economic Affairs (2000b), *Pesticide Production,* on the Internet Homepage www.ikm.iif.hu/english/economy/industr/novszer.htm, February.

Hungarian Ministry of Economic Affairs (2000c), *Pharmaceutical Industry,* on the Internet Homepage www.ikm.iif.hu/english/economy/industr/gyogyszer.htm, April.

Hungarian Ministry of Economic Affairs (2000d), *Cosmetics and Household Chemicals Market,* on the Internet Homepage www.ikm.iif.hu/english/economy/industr/kozmetik.htm, April.

Ministry of Economy (1998), *Poland's Report – Industry in 1997,* Warsaw.

Ministry of Economy (1999), *Poland's Report – Industry in 1998,* Warsaw.

Ministry of Economy of the Slovak Republic (1999), *Elaboration of the principles of the European Union's Industrial Policy for conditions of the Slovak Republic, including a Review of Branch Profiles*, Bratislava.

Ministry of Industry and Trade (2000), *Panorama of Czech Industry 1998/99,* Prague.

Ministry of Industry and Trade (2001), *Panorama of Czech Industry 2000,* Prague.

Ministry of Industry and Trade (2001a), *Analysis of the Czech Economy and MIT Sectors,* Prague.

New Europe, various issues.

NewsBase CEBD, various issues.

Ost-West-Contact, various issues.

Podkaminer, L. (1998), 'POLAND: Medium- and Long-term Economic Prospects', *WIIW Analytical Forecasts*, The Vienna Institute for International Economic Studies, April.

Polish Agency for Foreign Investment (PAIZ) (2001), *Chemical Industry in Poland,* Warsaw, January.

Prague Business Journal (1999), *Book of Lists 2000,* Prague.

Prague Business Journal (2000), *Book of Lists 2001,* Prague.

Raiffeisen Capital & Investment S.A. (2000), 'Pharmaceutical Industry Overview', in: Kompass Romania (2000), *Major Companies of Romania 2000,* Bucharest.

Rzeczpospolita (2001), *Lista 500*.

Romanian Economic Daily, various issues.

Romanian Government (2001), *National Programme for Accession of Romania to the European Union*, vol. I, June.

Slovenian Business Report, various issues.

Slovenian Business Week, various issues.

Statistical Office of the Slovak Republic (2000a), *Yearbook of Industry,* August.

Statistical Office of the Slovak Republic (2000b), *Bulletin,* no. 12.

Trend Top 200 (2001), October.

The Prague Post (1998), no. 11, 18-24 March.

United Nations Industrial Development Organization (UNIDO) (2001), *International Yearbook of Industrial Statistics 2001,* Vienna.

Universita' Commerciale Luigi Bocconi (1997), *EU Foreign Direct Investment in Central and Eastern Europe,* Research Project with the Financial Assistance of the Commission of the European Communities, Directorate-General III, Ref. SUB/96/83328/U.B., Milan, November.

Urban, W. (1999), 'Patterns of Structural Change in CEEC Manufacturing', in: *Structural Developments in Central and Eastern Europe, WIIW Report 1999*, The Vienna Institute for International Economic Studies, Vienna, August.

Urbanek, P. (1998), 'Polfa', in: *Eastern European Economics*, vol. 35, no. 5, September-October 1997, pp. 84-95.

Wilczynski, J. (1974), *Technology in Comecon*, The Macmillan Press Ltd.

Wolf, G. (2000), 'Alles Leben ist Chemie: Österreichs chemische Industrie im Strukturwandel', *Bank Austria Report*, 1/2000.

APPENDIX OF TABLES AND FIGURES

Table A1

Key data on total manufacturing

		1989	1992	1993	1997	1998	1999	2000	Average annual growth in % 1993-2000 EU(12)	1995-1999 EU(15)
BULGARIA										
Industrial production (at current prices)	in BGN mn	59	177	201870	13511	13501	12529	15170	.	.
Industrial growth (at constant prices)	in %	.	-17.2	-12.7	-12.0	-12.0	-9.2	5.3	.	.
Employment	in 1000	1420	883	767	720	690	616	526	.	.
Employment growth	in %	.	-16.3	-13.2	-2.7	-4.2	-10.7	-14.6	.	.
Wage growth (ECU basis)	in %	.	46.0	44.5	-1.6	25.9	5.0	11.8	.	.
Productivity growth	in %	.	-1.0	0.6	-9.5	-8.1	1.7	23.3	.	.
ULC growth (ECU basis)	in %	.	47.5	47.5	8.7	37.0	3.2	-9.3	.	.
Total exports to EU	in ECU mn	445	809	855	1940	2095	2099	.	13.8 [1)]	5.7
Total imports from EU	in ECU mn	1275	1029	1240	1674	2225	2480	.	11.5 [1)]	7.0
Trade balance with EU	in ECU mn	-830	-220	-385	266	-130	-381	.	.	.
Exports to the EU: Market shares	in %	0.13	0.21	0.23	0.37	0.36	0.33	.	.	.
CZECH REPUBLIC										
Industrial production (at current prices)	in CZK mn	558351	652893	655289	1330877	1442259	1438096	.	.	.
Industrial growth (at constant prices)	in %	.	-8.0	-8.4	7.6	4.4	-1.5	4.9	2.4	.
Employment	in 1000	1658	1181	1098	1173	1143	1078	1038	.	.
Employment growth	in %	.	-13.2	-7.0	-2.6	-2.6	-5.7	-3.7	-4.1	.
Wage growth (ECU basis)	in %	.	20.0	33.7	8.1	9.3	4.5	11.2	14.5	.
Productivity growth	in %	.	6.0	-1.5	10.4	7.1	4.5	3.5	6.0	.
ULC growth (ECU basis)	in %	.	13.2	35.7	-2.0	2.0	0.0	2.1	7.3	.
Total exports to EU	in ECU mn	.	.	4460	10989	13899	16023	.	21.2 [2)]	17.8
Total imports from EU	in ECU mn	.	.	5612	14617	15854	17177	.	17.8 [2)]	12.2
Trade balance with EU	in ECU mn	.	.	-1152	-3628	-1955	-1154	.	.	.
Exports to the EU: Market shares	in %	.	.	1.18	2.11	2.42	2.54	.	.	.
HUNGARY										
Industrial production (at current prices)	in HUF mn	1461100	1497321	1721479	5197367	6615642	7886728	1.1E+07	.	.
Industrial growth (at constant prices)	in %	.	-17.5	3.0	15.9	17.4	18.6	23.4	11.9	.
Employment	in 1000	1171	857	747	637	659	743	.	.	.
Employment growth	in %	.	-14.5	-12.9	0.7	3.4	1.2	.	-3.5 [1)]	.
Wage growth (ECU basis)	in %	.	14.5	18.4	10.8	2.3	10.4	.	6.2 [1)]	.
Productivity growth	in %	.	-3.5	18.2	15.2	13.6	17.2	.	14.4 [1)]	.
ULC growth (ECU basis)	in %	.	18.6	0.2	-3.8	-9.9	-5.8	.	-7.1 [1)]	.
Total exports to EU	in ECU mn	2245	3620	3616	11007	13791	16710	.	21.5 [1)]	23.9
Total imports from EU	in ECU mn	2713	3785	4621	11819	14317	16022	.	19.1 [1)]	18.3
Trade balance with EU	in ECU mn	-468	-165	-1004	-812	-527	688	.	.	.
Exports to the EU: Market shares	in %	0.67	0.96	0.96	2.11	2.40	2.65	.	.	.
POLAND										
Industrial production (at current prices)	in PLN mn	.	78975	104441	299825	334887	367025	.	.	.
Industrial growth (at constant prices)	in %	.	4.9	10.2	13.3	5.3	5.6	7.1	9.6	.
Employment	in 1000	3326	2767	2700	2821	2801	2611	2455	.	.
Employment growth	in %	.	-13.1	-2.4	0.7	-0.7	-6.8	-6.0	-1.5	.
Wage growth (ECU basis)	in %	.	2.6	13.8	11.1	8.5	3.8	16.7	11.8	.
Productivity growth	in %	.	20.7	12.9	12.5	6.1	13.2	14.0	11.2	.
ULC growth (ECU basis)	in %	.	-15.0	0.0	-1.3	2.3	-8.4	2.4	0.5	.
Total exports to EU	in ECU mn	2924	6070	6616	12772	14763	16239	.	13.9 [1)]	10.5
Total imports from EU	in ECU mn	3308	7103	8785	22634	25527	26642	.	18.8 [1)]	17.6
Trade balance with EU	in ECU mn	-384	-1033	-2169	-9863	-10764	-10403	.	.	.
Exports to the EU: Market shares	in %	0.87	1.61	1.75	2.45	2.57	2.57	.	.	.

Table A1 (continued)

Table A1 (continued)

									Average annual growth in %	
		1989	1992	1993	1997	1998	1999	2000	1993-2000	1995-1999
ROMANIA									EU(12)	EU(15)
Industrial production (at current prices)	in ROL bn	.	5484	15302	171363	205445	341484	376414	.	.
Industrial growth (at constant prices)	in %	.	-23.1	-1.2	-6.6	-11.4	-14.5	-1.4	-1.7	.
Employment	in 1000	.	2811	2590	2032	1907	1684	1566	.	.
Employment growth	in %	.	-12.5	-7.9	-5.4	-6.2	-11.7	-5.7	-7.1	.
Wage growth (ECU basis)	in %	.	-37.0	35.5	-7.1	24.7	-9.9	8.5	8.8	.
Productivity growth	in %	.	-12.1	-12.1	-1.4	-5.6	7.3	4.5	5.8	.
ULC growth (ECU basis)	in %	.	-28.3	-28.3	-5.8	32.0	-18.1	3.8	2.8	.
Total exports to EU	in ECU mn	2502	1355	1625	4297	4991	5534	.	21.3 [1)]	14.1
Total imports from EU	in ECU mn	603	1592	2003	4709	5956	5950	.	19.2 [1)]	13.7
Trade balance with EU	in ECU mn	1898	-237	-378	-412	-965	-416	.	.	.
Exports to the EU: Market shares	in %	0.74	0.36	0.43	0.82	0.87	0.88	.	.	.
SLOVAK REPUBLIC										
Industrial production (at current prices)	in SKK mn	.	.	266525	419028	545700	599075	708367	.	.
Industrial growth (at constant prices)	in %	.	-15.7	-11.9	2.6	7.5	3.4	10.4	3.0	.
Employment	in 1000	.	527	472	439	516	501	486	.	.
Employment growth	in %	.	-12.6	-10.4	-3.6	-4.4	-2.9	-2.9	-3.7	.
Wage growth (ECU basis)	in %	.	11.3	23.6	13.0	3.9	-3.2	12.9	11.2	.
Productivity growth	in %	.	-3.6	-1.6	6.5	11.1	6.5	13.7	6.8	.
ULC growth (ECU basis)	in %	.	15.4	15.4	6.1	-6.5	-9.2	-0.7	4.1	.
Total exports to EU	in ECU mn	.	.	1092	3846	5230	5797	.	28.7 [2)]	18.1
Total imports from EU	in ECU mn	.	.	1089	4446	5347	5217	.	26.1 [2)]	14.8
Trade balance with EU	in ECU mn	.	.	3	-601	-117	581	.	.	.
Exports to the EU: Market shares	in %	.	.	0.28	0.74	0.91	0.92	.	.	.
SLOVENIA										
Industrial production (at current prices)	in SIT mn	.	809602	998161	1868671	2077927	2165820	.	.	.
Industrial growth (at constant prices)	in %	.	-13.9	-4.0	-2.6	4.5	0.2	7.1	1.6	.
Employment	in 1000	370	282	257	229	227	224	225	.	.
Employment growth	in %	-1.4	-10.1	-9.0	-3.2	-0.8	-1.4	0.1	-3.7	.
Wage growth (ECU basis)	in %	.	-4.8	14.6	5.3	7.5	5.0	.	8.8 [1)]	.
Productivity growth	in %	.	-4.2	5.5	0.7	5.3	1.6	7.0	5.5	.
ULC growth (ECU basis)	in %	.	-0.6	8.6	4.6	2.1	3.3	.	3.3 [1)]	.
Total exports to EU	in ECU mn	.	1549	2798	4596	5132	5222	.	16.0 [1)]	5.7
Total imports from EU	in ECU mn	.	1323	2902	5922	6318	6499	.	22.1 [1)]	7.3
Trade balance with EU	in ECU mn	.	226	-104	-1326	-1186	-1277	.	.	.
Exports to the EU: Market shares	in %	.	.	0.74	0.88	0.89	0.83	.	.	.

Notes: 1) 1993-1999. - 2) 1994-1999.

EU: European Union (12), from 1997 European Union (15).

Bulgaria: 1989-1995: Total manufacturing excluding petroleum refineries.

Czech Republic: Up to 1996 enterprises with 100 employees or more, from 1997 enterprises with 20 employees or more. Industrial production at constant prices: 1997 and 1998 industrial output index calculated from production statistics of businesses with 20 employees or more.

Hungary: Industrial production: Enterprises with more than 20, from 1996 enterprises with more than 10 employees, from 1999 enterprises with more than 5 persons.
Employment and wages: Enterprises with more than 20 employees, from 1999 enterprises with more than 5 persons.

Poland: Industrial production at current prices: From 1993 excluding VAT; including import duties; from 1996 basic prices, the years before producer prices. Average monthly gross wages: Enterprises with more than 5 employees, from 1999 including mandatory premium for social security and all enterprises.

Romania: Net wages.

Slovak Republic: Enterprises with 25 and more employees, 1997 enterprises with 20 and more employees, from 1998 all enterprises.

Slovenia: Employment in enterprises, companies and organizations: 1989-1996 private enterprises are included only if they have 3 or more persons in paid employment and armed forces staff, from 1997 all enterprises.
Wages in enterprises, companies and organizations.

Source : WIIW Industrial Database

Table A2

Fertilizers in use

100% nutrients

	kg per ha[1]					1985=100				
	1986	**1990**	**1993**	**1998**	**1999**	**1986**	**1990**	**1993**	**1998**	**1999**
Bulgaria	182.3	172.1	52.4	30.2	26.0	91.9	86.8	26.4	15.2	13.1
Czech Republic	301.4	152.3	91.5	85.8	.	85.2	43.1	25.9	24.3	.
Hungary	261.4	126.9	41.6	65.0	68.6	103.4	50.2	16.5	25.7	27.1
Poland	243.0	119.5	87.8	108.2	106.0	106.1	52.2	38.3	47.2	46.3
Romania	121.8	109.8	54.1	38.7	33.4	108.0	97.3	48.0	34.3	29.6
Slovak Republic	346.2	174.8	61.5	55.8	63.8	92.9	46.9	16.5	15.0	17.1
Slovenia	212.7	190.0	319.5	376.6	388.7	104.3	93.1	156.6	184.6	190.5
Austria	151.6	121.4	106.4	98.9	93.4	99.3	79.6	69.7	64.8	61.2

Notes: 1) Hectare of cultivated agricultural land.
Source: WIIW Handbook of Statistics (2001)
and Präsidentenkonferenz der Landwirtschaftskammern Österreichs (1998).

Table A3

Chemicals, chemical products and man-made fibres

Estimated ranges for Unit Labour Costs in 1999, Austria 1999 = 100[1]

	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
PPP for GDP (lower range)	20	21	34	40	16	20	61
PPP for fixed capital formation (upper range)	49	32	55	54	39	32	71

Notes: 1) Defined as wages in ECU divided by productivity (measured as output at constant prices 1996 converted with ECU-based purchasing power parities (PPPs) divided by employees); gross wages used for calculation.
Source: WIIW

Table A4

Exports of individual industries in total manufacturing exports to the EU(15), 1999, in %

		Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
D	Manufacturing total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
DA	Food products; beverages and tobacco	8.4	1.3	4.3	5.8	1.3	0.8	1.5
DB	Textiles and textile products	30.4	7.3	7.6	13.9	40.0	9.0	9.9
DC	Leather and leather products	5.7	1.2	2.1	1.4	12.6	3.6	1.7
DD	Wood and wood products	2.6	3.2	1.3	5.8	3.6	2.4	4.5
DE	Pulp, paper & paper products; publishing and printing	1.1	2.6	1.0	2.6	0.3	2.6	3.9
DF	Coke, refined petroleum products & nuclear fuel [1)]	0.7	1.1	1.2	1.4	0.5	2.0	0.0
DG	**Chemicals, chemical products & man-made fibr**	**7.4**	**4.6**	**3.6**	**4.8**	**2.6**	**4.9**	**4.8**
DH	Rubber and plastic products	1.2	5.0	2.4	3.1	1.1	2.5	3.8
DI	Other non-metallic mineral products	2.4	4.5	1.3	3.0	2.1	2.9	3.1
DJ	Basic metals and fabricated metal products	24.4	13.6	5.8	14.3	12.0	11.8	12.9
DK	Machinery and equipment n.e.c.	7.3	13.0	6.5	6.4	5.7	9.0	14.6
DL	Electrical and optical equipment	4.2	16.4	34.7	13.3	7.2	13.0	11.3
DM	Transport equipment	2.2	20.8	26.0	14.1	4.0	33.1	18.9
DN	Manufacturing n.e.c.	2.2	5.4	2.3	10.1	6.9	2.5	9.2

Source: Eurostat, WIIW calculations

Table A5

Developments in GDP and gross industrial production

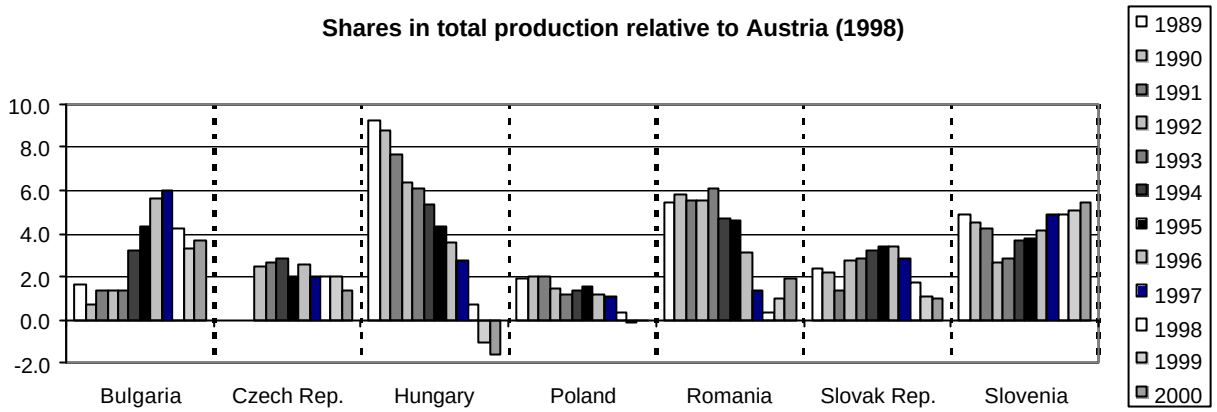
real change in % against preceding year

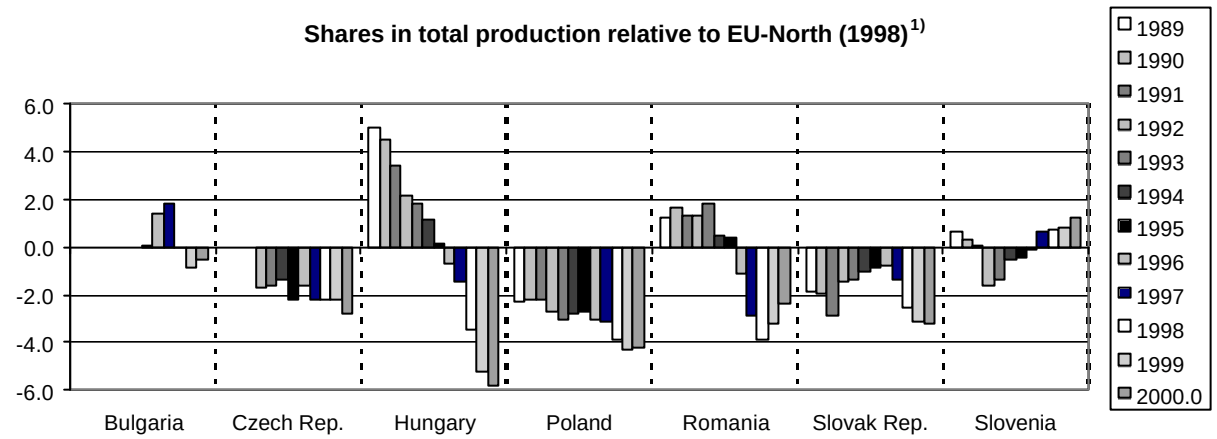
	Gross domestic product				Gross industrial production				
	1999	2000[1)]	2001	2002	1999	2000[1)]	2001	2002	2000
			forecast				forecast		1989=100
Czech Republic	-0.4	2.9	3.7	3	-3.1	5.1	7	6	81.3
Hungary	4.2	5.2	4.3	4.5	10.4	18.6	8	9	136.4
Poland[2)]	4.1	4.0	1	0	3.6	6.8	1	0	129.7
Slovak Republic	1.9	2.2	3	3	-3.6	9.1	6	6	89.0
Slovenia	5.2	4.6	3.4	4	-0.5	6.2	3	4	80.3
Bulgaria	2.4	5.8	4	4	-9.3	5.8	4	4	49.6
Romania	-2.3	1.6	4	2	-2.2	8.2	5	2	50.3

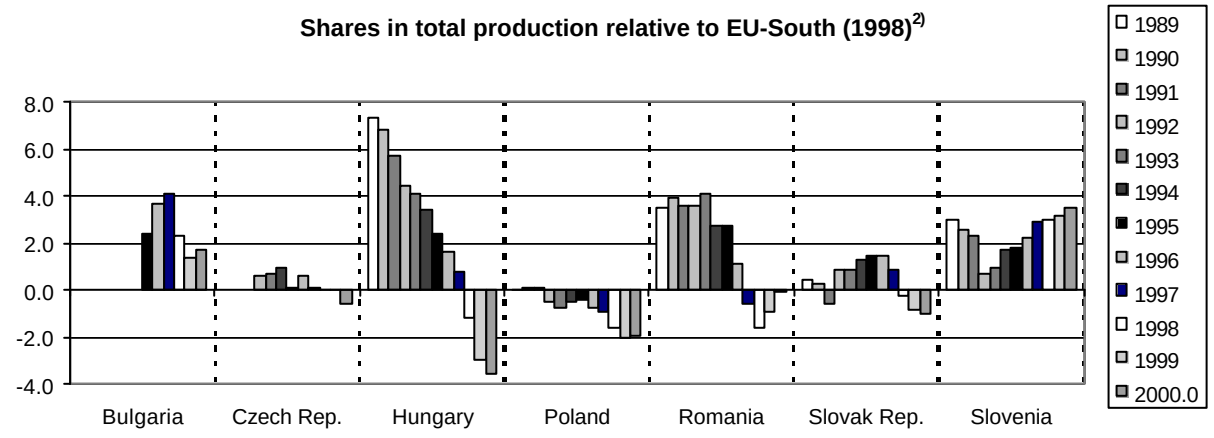
Notes: 1) Preliminary.- 2) Sales.
Source: WIIW (October 2001).

Figure A1

Chemicals, chemical products and man-made fibres
Shares of CEECs (at constant prices 1996) relative to other countries





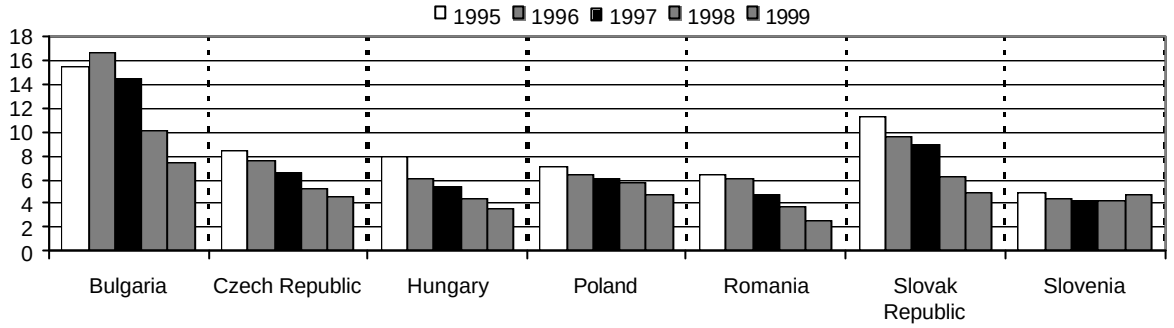


Notes: 1) Including UK, France, Germany and Belgium.- 2) Including Greece, Portugal, Spain.
Source: WIIW Industrial Database, Eurostat.

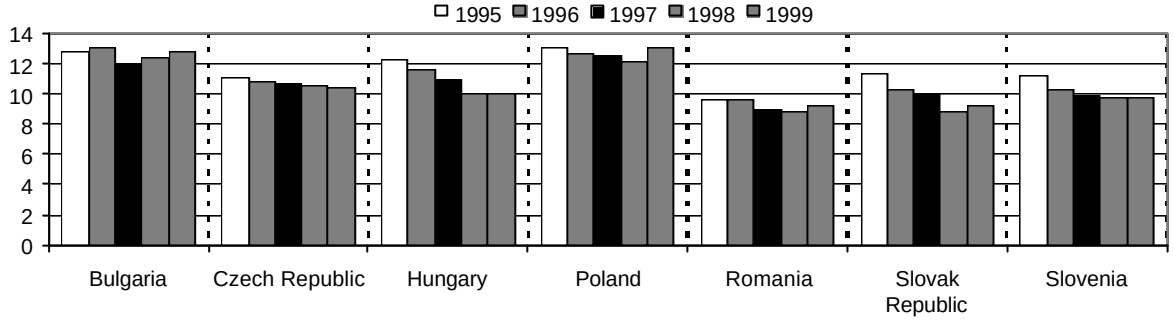
Figure A2

Chemicals, chemical products and man-made fibres

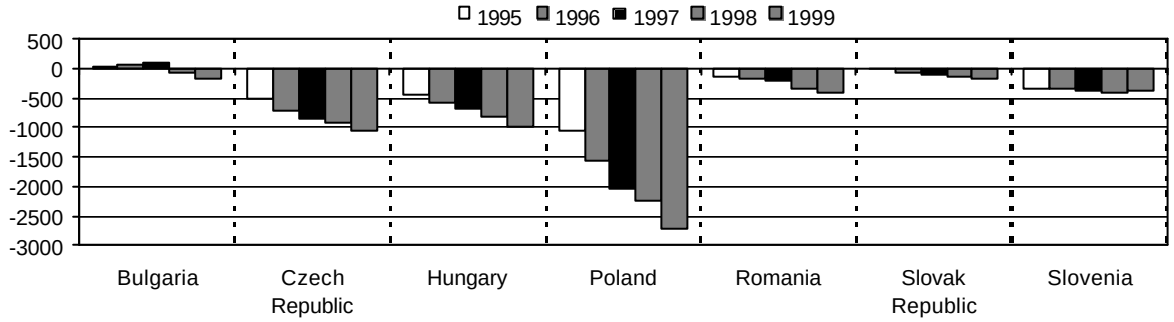
Share in manufacturing exports to the EU(15), in %



Share in manufacturing imports from the EU(15), in %



CEECs trade balance with the EU(15), ECU mn



Source: Eurostat, WIIW calculations

WIIW Industrial Database Eastern Europe

Patterns of industrial development and restructuring at a glance

This unique annual database reveals transition progress through shifts in industrial structures by manufacturing branch. The database covers 14 CEEC manufacturing industries, consistent under 2-digit NACE classifications that facilitate comparisons over time, across countries and with Western Europe.

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Updates: Twice a year (June and December)

Topics covered:

Industrial production (current prices), national currency million
Production structure (current prices), manufacturing = 100
Industrial production (constant prices), national currency million
Production structure (constant prices), manufacturing = 100
Production growth, annual changes in %
Employment, thousand persons
Employment structure, manufacturing = 100
Employment growth, annual changes in %
Average monthly gross wages (national currency)
Average monthly gross wages (ECU)
Average monthly gross wages (DEM)
Average monthly gross wages (USD)
Average monthly gross wages, manufacturing = 100
Average monthly gross wages, annual changes, real (deflated with CPI)
Labour productivity, manufacturing = 100
Labour productivity, annual changes in %
Unit Labour Costs (national currency), manufacturing = 100
Unit Labour Costs (national currency), annual growth rates in %
Unit Labour Costs (ECU), annual growth rates in %
Unit Labour Costs (DEM), annual growth rates in %
Unit Labour Costs (USD), annual growth rates in %
Unit Labour Costs ECU, Austria = 100
Exports to the EU, 1000 ECU
Imports from the EU, 1000 ECU
Foreign trade with the EU, Balance, 1000 ECU

WIIW Industrial Database Eastern Europe

Tables contained in the database:

	By NACE industries	Dimension
D	Manufacturing total	Countries X 1989-00
DA	Food products; beverages and tobacco	Countries X 1989-00
DB	Textiles and textile products	Countries X 1989-00
DC	Leather and leather products	Countries X 1989-00
DD	Wood and wood products	Countries X 1989-00
DE	Pulp, paper & paper products, publishing & printing	Countries X 1989-00
DF	Coke, refined petroleum products & nuclear fuel	Countries X 1989-00
DG	Chemicals, chemical products and man-made fibres	Countries X 1989-00
DH	Rubber and plastic products	Countries X 1989-00
DI	Other non-metallic mineral products	Countries X 1989-00
DJ	Basic metals and fabricated metal products	Countries X 1989-00
DK	Machinery and equipment n.e.c	Countries X 1989-00
DL	Electrical and optical equipment	Countries X 1989-00
DM	Transport Equipment	Countries X 1989-00
DN	Manufacturing n.e.c.	Countries X 1989-00

By country	Dimension
Czech Republic	NACE X 1989-2000
Hungary	NACE X 1989-2000
Poland	NACE X 1989-2000
Romania	NACE X 1989-2000
Slovak Republic	NACE X 1989-2000
Slovenia	NACE X 1989-2000
Bulgaria	NACE X 1989-2000

By year	Dimension
1989	NACE X Countries
1990	NACE X Countries
1991	NACE X Countries
1992	NACE X Countries
1993	NACE X Countries
1994	NACE X Countries
1995	NACE X Countries
1996	NACE X Countries
1997	NACE X Countries
1998	NACE X Countries
1999	NACE X Countries
2000	NACE X Countries

The WIIW Industrial Database Eastern Europe is available on diskette (MS Excel format; two updates a year) at a price of ATS 9,000 (€ 654.06). Reduced rate for Member companies: ATS 6,000 (€ 436.04)

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