

WIIW INDUSTRY STUDIES
2000/2

**Development and
Prospects of the
Rubber and Plastic
Products Sector
in the Central and
Eastern European
Countries**

WIIW INDUSTRY STUDIES

In this series, The Vienna Institute for International Economic Studies (WIIW) publishes results which stem from its research on structural developments in CEEC economies. In 1996/97 the WIIW started to build up its Industrial Database Eastern Europe which comprises time series for the Czech Republic, Hungary, Poland, Slovakia, Slovenia, Bulgaria and Romania.

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- *Other non-metallic mineral products*
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- *Machinery and equipment n.e.c.*
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Each of these studies presents a detailed picture of the development and prospects of the particular industry in central and eastern Europe. The first part of each study concentrates on: the patterns of production and employment; international competitiveness and trade performance with the EU (productivity, labour costs, price and quality indicators, revealed comparative advantage, etc.); and foreign direct investment. The second part provides more detailed industry data and valuable information about the leading domestic firms and the foreign investors in the industry.

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- *1999/1 Development and Prospects of the Mechanical Engineering Sector in the Central and Eastern European Countries (March 1999)*
- *1999/2 Development and Prospects of the Paper and Printing Sector in the Central and Eastern European Countries (May 1999)*
- *1999/3 Development and Prospects of the Wood and Wood Products Sector in the Central and Eastern European Countries (September 1999)*
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- *2000/2 Development and Prospects of the Rubber and Plastic Products Sector in the Central and Eastern European Countries (March 2000)*

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March 2000

Doris Hanzl

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Executive Summary

*In Central and Eastern Europe, as in most other economies, the rubber and plastic products sector is small compared to other sectors of manufacturing, not reflecting its apparent importance in the modern world. However, it supplies a **wide range of products** (including tyres, plastic packaging, windows, plastic parts for cars, electrical engineering etc.) to all main branches of manufacturing. In the Central and Eastern European countries (CEECs), rubber and plastic products were somewhat neglected during the former communist regime, but developed quite well thereafter in the more advanced CEECs, where they also show favourable future prospects.*

Part One of the study investigates the development and prospects of the rubber and plastic products sector in the following countries:

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

*In size, the rubber and plastic products sector plays only a **minor role** in total manufacturing today and contributes between 2% of manufacturing output in Romania and about 4% in the Czech Republic, Poland and Slovenia.*

*In the first phase of transition, which lasted from 1989 to around 1992, the output of the rubber and plastic products sector declined along with the rest of the economy, but less than total manufacturing in most countries. From 1993 on, growth turned positive in all countries, except in Bulgaria and Romania, and the sector grew faster than total manufacturing. Hence, the sector was **one of the most dynamic sectors** of the economy, supported by accelerating domestic demand for inputs, for example, from the rapidly expanding automobile industry (tyres!) and electrical engineering (parts!). In the region, the rubber and plastic sector grew most vigorously in **Poland and Hungary**.*

*Also as an employer, the rubber and plastic products sector holds a minor position as employment shares range again only between 2% in Romania and slightly above 4% in Slovenia. Nevertheless, the sector plays a significant role in most countries, due to its **dynamic, and sometimes employment-creating, role**.*

As is typical for all CEECs and all sectors of manufacturing, wages, productivity and unit labour costs in the rubber and plastic products sector have generally been much lower than in West European countries, for which we used Austria as a point of reference. From 1993 to 1997, wages and productivity rose in all CEECs. As the wage increase was larger than the productivity increase, unit labour costs rose in all countries, except in Hungary. Nevertheless, the estimated unit labour costs remain at a much lower level than in Austria.

The range for CEECs' unit labour costs in the rubber and plastic products sector as a percentage of the Austrian level is:¹

Bulgaria	16% - 29%	Romania	14% - 33%
Czech Republic	28% - 38%	Slovakia	19% - 27%
Hungary	15% - 24%	Slovenia	54% - 62%
Poland	19% - 26%		

In CEECs' manufacturing exports to the EU, the rubber and plastic products sector is of little importance and only accounts for 1% of total exports in Bulgaria and Romania, and 5% in the Czech Republic. It is mainly **domestic market oriented**, with the only exception of the Czech rubber and plastic products sector. Exports are equally distributed between rubber and plastic products, **export quality has reached the EU level**.

In CEECs' manufacturing imports from the EU, rubber and plastic products also account for rather small shares which were, however, larger than the shares in exports. Import shares ranged between 3% in Romania and 7% in the Czech Republic in 1998. Imports were mainly dominated by **plastic products** and grew quite dynamically during transition, due to pent-up demand for plastic products in some areas, continuous replacement of other material by plastic, and strong intra-industry trade.

The sector was a **net importer** in all CEECs. The deficit was highest in Poland (ECU 1 bn in 1998). Also, compared to total manufacturing, the sector shows a **revealed comparative disadvantage**, with relatively better results for the rubber industry than for other sub-branches.

On the **EU market**, in 1989, CEEC rubber and plastic products exports had a market share of about 3%, which increased steadily to 9% in 1998, slightly faster than that of overall exports (all shares without intra-EU trade). On the **Austrian market**, CEEC exports had a decisively **larger share**, accounting for 35% of Austria's non-EU rubber and plastic products imports in 1995, climbing to 38% in 1998.

From an overall point of view, the sector is not a prominent target for foreign direct investment due to its relatively small size. Nevertheless, **foreign investors** have shown a relatively **strong interest** in the sector, drawn by its good future prospects, growing domestic demand and promising possibilities in the tyre industry in particular.

The development of the rubber and plastic products sector is strongly influenced by the development of the overall economy. The sector has performed best in Poland, Hungary and Slovenia, followed by the Czech and Slovak Republics, while it is trailing behind in Romania and Bulgaria. However, in general, the rubber and plastic products sector has **very good future prospects throughout the region**, as major segments of demand will experience

¹ The lower range is calculated at purchasing power parities (PPP) for GDP, the upper range at PPP for fixed capital formation; figures are for 1998, the Austrian level is for 1996.

vigorous growth. Some constraints might arise from environmental considerations, also with regard to EU accession.

Part Two of the study presents a more thorough micro-analysis of the rubber and plastic products sector, containing **company profiles** of selected domestic enterprises and foreign investors in the two industries.

Companies in the rubber and plastic products sector usually show above-average profitability and investment performance. Regarding the two sub-sectors, the rubber and plastics industries, the latter has generally a greater weight in the whole sector than the former. In Hungary, for example, the plastics industry produced 78% of the sector's output, while the rubber industry contributed only 22%. In Slovenia on the other hand, the respective shares were 54% and 46%, while in the Czech Republic and Poland they lay in between and measured about 68% and 32%. The company structure differs considerably, with small and medium-sized enterprises dominating in the former industry and large multinationals in the latter. In the CEECs, the **tyre industry** has especially attracted large foreign tyre companies, which have invested heavily in the region. In particular Continental from Germany, Goodyear from the USA, Michelin from France but also Bridgestone from Japan have formed joint ventures, acquired existing companies or built green-field plants in all countries, except in Bulgaria. The export performance of these foreign companies is especially high in the smaller CEECs, reaching 70% to 80% of the company's output. Export orientation is less pronounced in the **plastics industry** with its smaller companies. Producers in this field have partly evolved from former large chemical conglomerates and could also attract foreign direct investment due to promising future prospects.

Development and Prospects of the Rubber and Plastic Products Sector in the Central and Eastern European Countries

Part I: INDUSTRY SURVEY

In general, the rubber and plastic products sector is a comparatively small sector of manufacturing. Its size however, does not reflect its relative importance in the world today. Due to the positive characteristics of their raw materials,² rubber and plastic products are available in many different forms and types, used in all main branches of manufacturing and by all people today. The main product of the rubber industry are tyres,³ while the range of plastic products is extremely wide, including food and beverage packaging, plastic windows or floor covering, parts for the electrical industry, parts for cars, ships or aeroplanes, to household plastic articles, plastic furniture and toys.⁴ In addition, there are no limits for future expansion into new ranges of application, except for environmental concerns and recycling considerations.

The rubber and plastic products sector procures raw materials from the petro-chemical industry and supplies semi-finished and finished products to many branches, which explains its sensitivity to the business-cycle. It is considered a medium-high-technology sector. While the rubber industry can be classified as rather labour- and energy-intensive, the plastics industry is more capital-intensive. Large multinational companies dominate the first industry, while small and medium-sized companies are prevalent in the latter.

This study provides a thorough two-part picture of the rubber and plastic products sector in the Central and Eastern European Countries (CEECs). The first part gives a more macro-economic survey of the developments and prospects of the sector, while the second part presents detailed further information on the sector as well as on company profiles of selected domestic and foreign enterprises. In the first part there are four sections: The first section deals with trends in growth and structure of the sector, including characteristics of production and employment. The next section analyses indicators of international competitiveness, in particular wage rates, productivity levels and unit labour costs. The third section examines various aspects of trade performance with the European Union, while section four takes a closer look at foreign direct investment in this sector. A concluding chapter provides an outlook on future prospects and an appendix presents additional tables and figures.

² Low weight, good workability and flexibility, good isolation and resistance.

³ In the European Union, tyres account for 60% of the production of all rubber products, other rubber products account for 40%. In general, the rubber industry is smaller than the plastics industry (see Europäische Kommission, page 8-1).

⁴ Plastic products are mainly used for: 36% packaging, 20% construction industry, 7% electrical engineering and electronic industry, 7% parts for transport equipment, 4% agriculture, 3% furniture (EU average, 1994, see Europäische Kommission, page 8-9).

The exact term of the rubber and plastic products sector according to the NACE rev. 1 classification system is 'manufacture of rubber and plastic products'.⁵ The subsequent quantitative analysis is based on the WIIW Industrial Database-Central and Eastern Europe (IDB-CEE), which currently includes Bulgaria, the Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia.⁶

1 Overview: Trends in growth and structure

Position of rubber and plastic products sector in the past and today

In general, the rubber and plastic products sector is a small sector compared to other sectors of total manufacturing. In the CEECs, the sector was furthermore neglected during the command economy with its pronounced bias toward heavy industry and toward the production of raw materials and intermediate products. Finished and/or consumer goods as well as matters of consumer convenience (e.g. packaging) were of lower quality and mostly ignored. Thus at the beginning of transition, the rubber and plastic sector was relatively underdeveloped and production shares in total manufacturing ranged only between 2% in Hungary and 4% in Romania⁷ (at constant prices, see Table 2). During transition, however, the sector developed favourably in the more-advanced CEECs.

In the region and measured at constant prices, Slovenia's and Slovakia's sector led in size, while that of Romania and Bulgaria constantly declined. The other countries were in between (see Figure 1).

When compared to the countries of the European Union, differences in the size of the rubber and plastic products sector were in general rather small over the whole period of 1989 to 1998. In the first years of transition, the countries of the more advanced 'EU-North'⁸ showed a comparatively larger rubber and plastic products sector than the CEECs, while in the last few years shares converged to the same level. On the other hand, Slovakia and Slovenia had slightly higher sectoral shares than the less advanced countries of the 'EU-South'⁹ over the whole period (see Appendix A, Figure A1).

⁵ In detail, the rubber and plastic products sector (division 25 in the NACE rev. 1 classification system) contains the 'manufacture of rubber products' (group 25.1) and the 'manufacture of plastic products' (group 25.2).

⁶ For Bulgaria, however, data are not consistent over the whole time period. Data before 1996 can be compared with those for 1996 and 1997 only to a limited extent. For Romania, production data at constant prices from 1994 on have to be interpreted carefully due to statistical problems. For a detailed description of data and changes in statistics over all countries, see Appendix A, Table A1, footnote.

⁷ This large share in Romania at the beginning of transition might be due to the enforced development of the petrochemical sector, a prestige project of the Ceausescu regime, which is a major supplier to the rubber and plastic products sector.

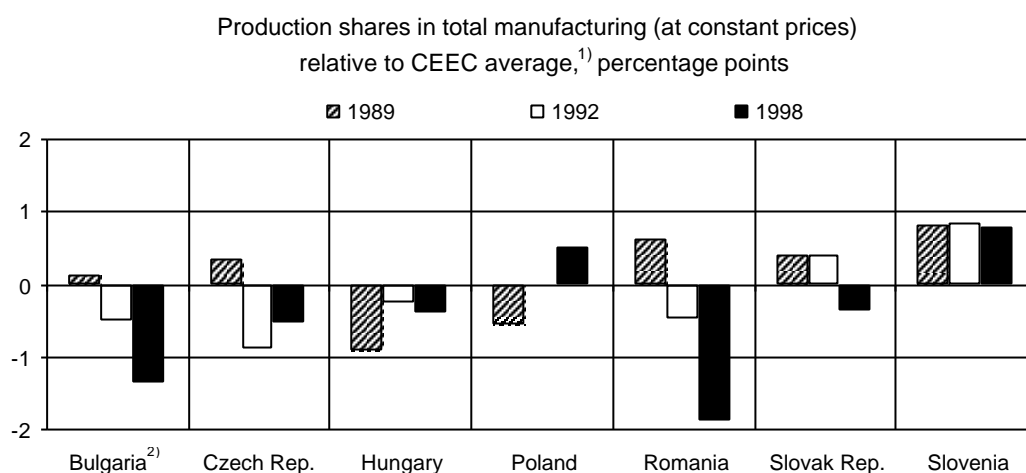
⁸ Including France, Germany and the United Kingdom, from 1989-1992 also Belgium.

⁹ Including Greece, Portugal and Spain.

Figure 1

Rubber and plastic products

Relative position of CEECs' rubber and plastic products sectors in the region



1989 and 1992 production shares at constant prices: Bulgaria at 1996 prices, Czech Republic at 1993 prices, Hungary at 1992 prices, Poland at 1992 prices, Romania at 1993 prices, Slovak Republic at 1993 prices, and Slovenia at 1996 prices. 1998 production shares at constant prices 1996 for all countries.

Notes: 1) The CEEC average includes the Czech Republic, Hungary, Poland, Slovakia and Slovenia. - 2) Bulgarian data are not consistent over the whole period. Data before 1996 can be compared with those for 1996 to 1998 only to a limited extent.

Source: WIIW Industrial Database.

Table 1

Production shares of individual industries in total manufacturing (at current prices), 1998, in %

	Bulgaria ¹⁾	Czech Republic	Hungary	Poland	Romania ²⁾	Slovak Republic	Slovenia ²⁾
D Manufacturing total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
DA Food products; beverages and tobacco	24.8	17.1	18.9	26.0	21.9	14.7	15.4
DB Textiles and textile products	6.8	4.6	3.7	5.3	6.3	4.3	7.1
DC Leather and leather products	1.4	0.7	0.8	1.0	1.6	1.0	1.9
DD Wood and wood products	1.2	2.4	1.4	3.5	2.2	3.3	3.3
DE Pulp, paper & paper products; publishing and printing	3.9	4.6	4.0	5.7	2.6	6.0	7.5
DF Coke, refined petroleum products & nuclear fuel	11.3	2.5	5.8	3.9	10.5	5.9	1.0
DG Chemicals, chemical products & man-made fibres	10.0	6.4	8.0	6.9	9.1	6.8	10.5
DH Rubber and plastic products	2.6	4.1	3.5	4.3	2.1	3.5	4.2
DI Other non-metallic mineral products	4.8	5.9	3.2	5.0	5.3	5.0	4.7
DJ Basic metals and fabricated metal products	12.0	18.4	9.3	11.5	17.9	17.7	11.5
DK Machinery and equipment n.e.c.	12.4	9.3	4.8	6.0	5.9	7.2	10.0
DL Electrical and optical equipment	4.4	7.3	19.5	6.8	4.9	7.9	9.1
DM Transport equipment	3.2	13.0	15.7	9.7	6.4	13.9	9.2
DN Manufacturing n.e.c.	1.3	3.7	1.3	4.7	3.3	3.0	4.7

Notes: 1) Mechanical engineering includes fabricated metal products and casting of metals, normally included in the basic metals and fabricated metals sector (DJ). - 2) 1997.

Source: WIIW Industrial Database.

Table 1 gives an overview of the relative size of the rubber and plastic products sector compared to other branches in manufacturing in 1998 (measured at current prices). The shares ranged between 2% (in Romania) and above 4% (in the Czech Republic, Poland and Slovenia, see Table 1).¹⁰

One of the most dynamic sectors of the economy, growth leader in Poland and Hungary

During the first phase of transition all CEECs experienced a severe transformational recession and production in the rubber and plastics sector declined along with the larger economy. However, this decline was much less pronounced than in total manufacturing in most CEECs and the sector became one of the least affected in the recession (see Table 3). This was partly due to the pent-up demand for rubber and plastic products in the CEECs in some areas, e.g. packaging, as well as a constant replacement of other material by plastic as in other developed countries. Only in the Czech Republic, Bulgaria and Romania did the sector worse than total manufacturing, probably due to a higher export-orientation to the former CEMA-region and delayed restructuring.

During the second transition period, from 1993 onwards, growth turned positive in the rubber and plastic products sector throughout the region, except in Romania and Bulgaria. In fact, the favourable trend of the last years continued and the sector grew faster than total manufacturing. Thus, the sector became a major 'winning' sector of the economy,¹¹ supported by a dynamic domestic demand for inputs, for example, from the rapidly expanding automobile industry (tyres!) and electrical engineering sectors (parts!). Only in the Czech Republic did foreign demand contribute to growth. Also the increase in the number of small and medium-sized enterprises promoted the sector's successful development and its employment creation (see below).

In Poland, the rubber and plastic products sector experienced the most dynamic growth in the region. Here the sector surpassed the 1989-level already in 1993 and reached about 260% in 1998 (see Figure 2). In Hungary, the rubber and plastics sector also showed a rather dynamic development and grew to 180% of the 1989 level by 1998. On

¹⁰ In the rubber and plastic products sector itself, the production of plastic products dominates. In the Czech Republic, 68.5% of all receipts for sale came from plastic products in 1997, 31.5% from rubber products. In Hungary, plastic products accounted for 78% of gross output in 1997, rubber products for 23%. In Slovenia again, only 54% of total revenues came from plastic products in 1998, 46% from rubber products.

¹¹ 'Winners' of transition are here defined as industries, that performed better than total manufacturing in terms of production growth, 'losers' those that performed worse, see Urban, W. (1999), page 22.

Indeed the sector grew the fastest in total manufacturing in Poland, ranked second in the Czech Republic and third in Hungary and Slovenia.

the other hand, production fell constantly in Romania and hence lay substantially below 1989 production levels in 1998 (see Table 3).¹²

Table 2

Rubber and plastic products

Production shares (at constant prices 1996), in %
Manufacturing = 100

	1989	1992	1997	1998
EU-North ¹⁾	.	4.7	4.1 ²⁾	.
EU-South ¹⁾	.	2.6	3.4 ²⁾	.
Austria ³⁾	3.8	3.3	3.7	3.7
Bulgaria	2.6	2.5	2.6	2.6
Czech Rep.	3.2	2.4	3.2	3.5
Hungary	2.1	3.0	3.8	3.6
Poland	2.2	3.2	4.2	4.5
Romania	3.9	3.2	2.2	2.1
Slovak Rep.	3.1	3.6	4.5	3.6
Slovenia	3.3	3.9	5.0	4.8

Notes: 1) 1992 data at 1989 prices, 1996 data at prices 1996. - 2) 1996. - 3) 1989 and 1992 at 1993 prices.

Source: WIIW Industrial Database.

Table 3

Rubber and plastic products

Production growth (at constant prices 1996)

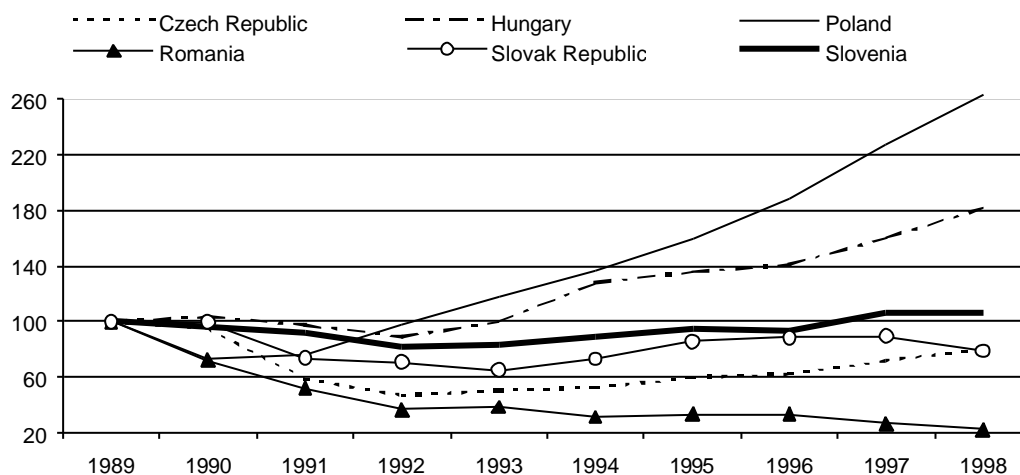
	Average annual changes in %		Relative to total Manufacturing, in percentage points		Index 1998 = 100
	1990-1992	1993-1998	1990-1992	1993-1998	
Czech Rep.	-22.5	9.4	-8.3	6.9	79.9
Hungary	-3.8	12.6	11.2	3.5	181.7
Poland	-0.5	17.5	10.7	6.8	258.7
Romania	-28.5	-8.1	-4.4	-6.7	22.0
Slovak Rep.	-10.8	1.7	5.1	0.0	78.7
Slovenia	-6.6	4.6	4.7	3.7	107.0

Source: WIIW Industrial Database.

Figure 2

Rubber and plastic products

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



Source: WIIW Industrial Database.

¹² However, the rubber and plastic products sector did slightly surpass the level in Slovenia (107%).

Small, but dynamic employment sector

In employment too, the rubber and plastic products sector is a rather small sector in total manufacturing, with its relative size varying little across the region: In 1998, shares ranged from 2% in Romania to slightly above 4% in Slovenia (see Table 4). Nevertheless, employment was reduced less than in total manufacturing or even grew during transition. In fact, average growth rates between 1993 and 1998 were positive in the Czech Republic,¹³ Hungary and Poland and the sector showed the most dynamic employment growth in total manufacturing in these countries (see Table 6). Hence, the rubber and plastic products sector gained in significance during transition and shares were somewhat larger in 1998 than in 1989. This is also in line with slightly growing employment shares in Western countries, indicating the dynamic nature of the rubber and plastic products sector in the developed world. The only exception in the CEECs was Romania, where employment was reduced dramatically and the sector's share declined (see Table 4 and Table 5).

Table 4

Rubber and plastic products

Employment shares, in %
Manufacturing = 100

	1989	1992	1997	1998
EU-North	.	4.8	5.5 ²⁾	.
EU-South	.	3.4	3.5 ²⁾	.
Austria	3.2	3.3	4.2	4.6
Bulgaria	2.4	2.7	3.4	3.2
Czech Rep.	2.1	2.2	3.9	4.1
Hungary	2.3	2.6	3.6	3.9
Poland	2.4	2.6	3.7	3.9
Romania	2.5 ¹⁾	2.5	2.2	2.1
Slovak Rep.	.	2.6	3.3	3.1
Slovenia	2.9	3.5	4.3	4.4

Notes: 1) 1990.- 2) 1996.

Source: WIIW Industrial Database.

Table 5

Rubber and plastic products

Employment
thousand persons

	1989	1992	1997	1998	1998 1989=100
Bulgaria	34	24	24	22	62.7
Czech Rep.	35	26	46	47	134.5
Hungary	27	22	23	26	95.2
Poland	80	71	104	109	136.8
Romania	86 ¹⁾	70	45	42	48.8 ²⁾
Slovak Rep.	.	14	15	16	.
Slovenia	11	10	10	11	100.6

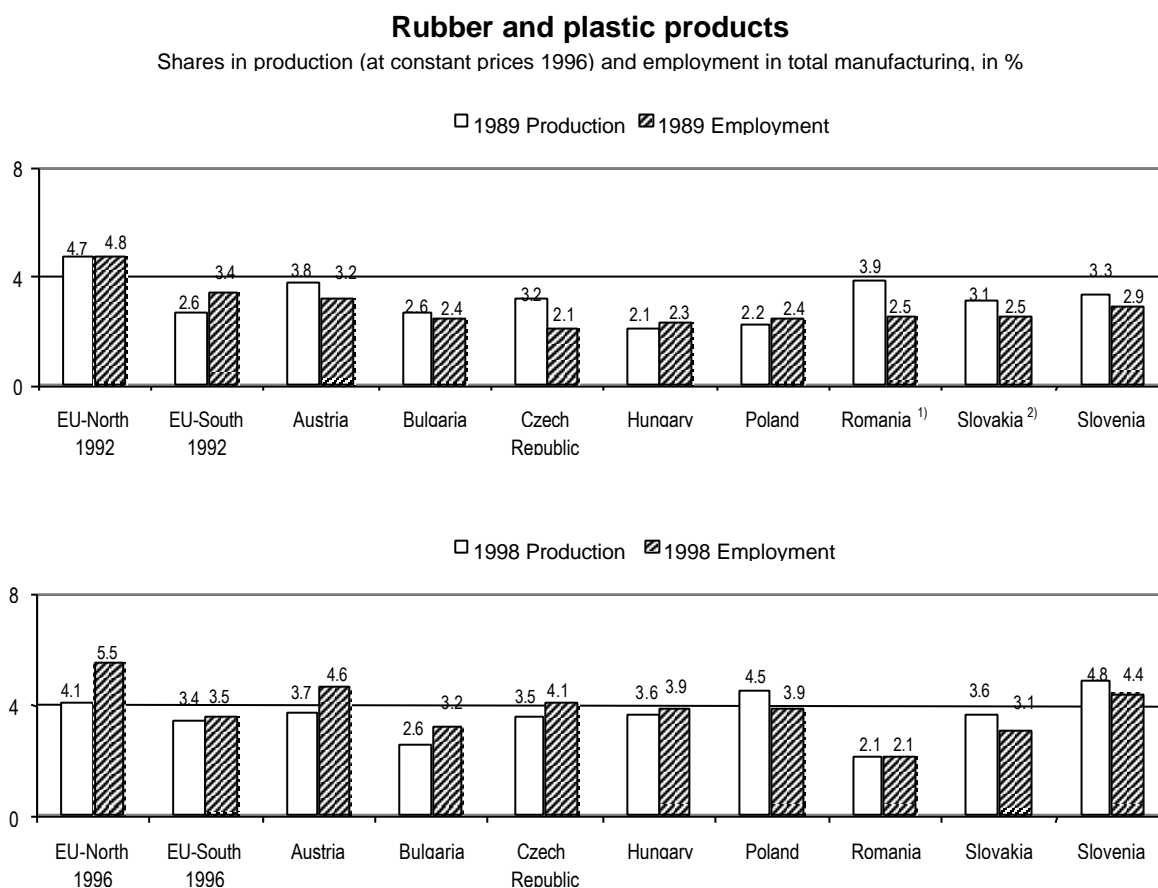
Notes: 1) 1990. - 2) 1990=100.

Source: WIIW Industrial Database.

¹³ In the Czech Republic, a change in statistics has played a certain role as well. The number of employees increased by 50% in 1997 (from 30,000 in 1996 to 46,000 people in 1997), when all companies with more than 20 employees were included in statistics instead of companies with more than 100 employees before. However, growth rates were adjusted to this change.

Comparing production and employment shares of the sector, the former were slightly higher in many countries in 1989 and remained so by 1998. However, several exceptions existed, so that no uniform picture across the region emerges. In general, however, differences between production and employment shares were quite small (see Figure 3). Most important, both production and employment shares grew quite visibly throughout the region, except in Romania.

Figure 3



Notes: 1) Employment share 1990.- 2) Employment share 1991.

Source: WIIW Industrial Database.

2 International competitiveness

As is typical for all CEECs and all sectors of manufacturing, wages, productivity and unit labour costs in the rubber and plastic products sector were and are generally much lower than in Western countries. In 1998, nominal wages rates (per employee) in the rubber and plastic products sector, for example, hovered around 10% of the Austrian level in most

countries, but reached only 4% in Bulgaria and Romania, and almost 30% in Slovenia.¹⁴ Unit labour costs¹⁵ were somewhat higher and ranged mostly between 10% and 20% of the Austrian level,¹⁶ with the only exception of Slovenia, where unit labour costs reached more than 50% of the Austrian level.¹⁷ The productivity¹⁸ level of the rubber and plastic products sector was highest in Hungary and Slovakia and reached about 70% of the Austrian level.¹⁹ It was followed by Poland, Slovenia and the Czech Republic, and showed the lowest levels in Romania and Bulgaria.

During transition, wages and productivity in the rubber and plastic products sector grew throughout the region: Between 1993 and 1998, annual average growth rates of wages ranged between 5% in Hungary and 18% in the Czech Republic, while the productivity increase was the highest in Hungary, followed by Poland (see Table 6). In Hungary, alone, the increase in productivity was higher than the wage increase, so that unit costs declined, while in the other countries unit labour costs increased.

Table 6

Rubber and plastic products

Average annual growth rates, 1993-1998

in %

	Output	Employment	Productivity (ECU basis)	Exports To EU (ECU basis)	Wage rates (ECU basis)	Unit Labour Costs (ECU basis)
Czech Republic	9.4	3.8	5.4	29.4 ¹⁾	17.5	11.5
Hungary	12.6	2.3	10.1	16.1	4.9	-4.7
Poland	17.5	7.4	9.4	26.6	11.9	2.2
Romania	-8.1	-8.3	0.2	18.4	13.5	13.2
Slovak Republic	1.7	-1.5	3.2	25.8 ¹⁾	14.0	10.4
Slovenia	4.6	-0.8	7.2	5.8 ¹⁾	7.9	2.4

Notes: 1) 1994-1998.

Source: WIIW Industrial Database.

¹⁴ In Hungary, for example, wages in the rubber and plastic products sector reached about 10% of the Austrian level. In the production cost structure of companies, wages and salaries accounted for about 11% of total costs in this sector, similar to the average for total manufacturing. Material and services made up the major share of costs, accounting for over 70% (1996 data).

¹⁵ Defined as wage rates divided by labour productivity.

¹⁶ The surge in the Czech unit labour costs in 1997 and 1998 is due to a change in the statistical basis of employment data from companies with more than 100 employees to companies with more than 20 employees. It caused the recorded employment level to rise dramatically (see also Appendix A, Table A1, footnote).

¹⁷ As these figures are however strongly affected by different productivity estimates, Table A2 in the Appendix shows the lower and upper range for estimated unit labour costs in 1998, using alternative productivity measurements.

¹⁸ Defined as output (at constant prices) divided by the number of employees, converted into ECU by purchasing power parities (PPPs).

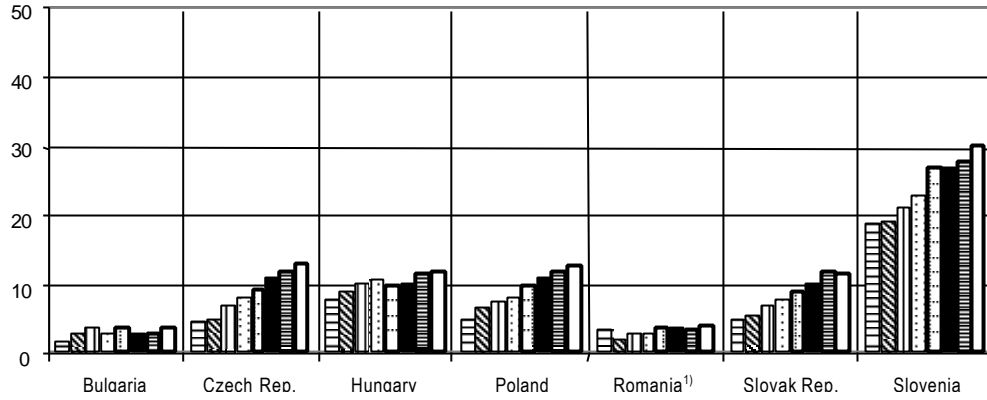
¹⁹ Also in Slovakia, a change in the statistical basis of employment data can explain the drop in productivity from 1997 to 1998. First companies with more than 20 employees were included in the data, then all companies.

Figure 4

Rubber and plastic products

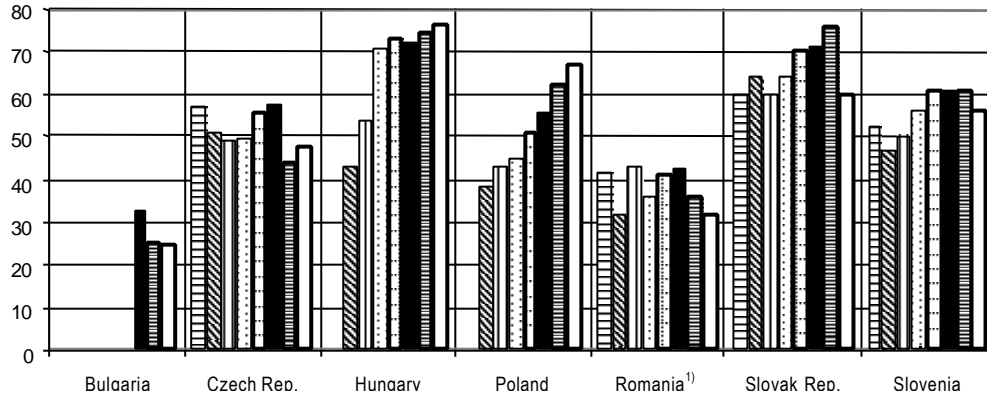
Wages (ECU), Austria 1996 = 100

1991 1992 1993 1994 1995 1996 1997 1998



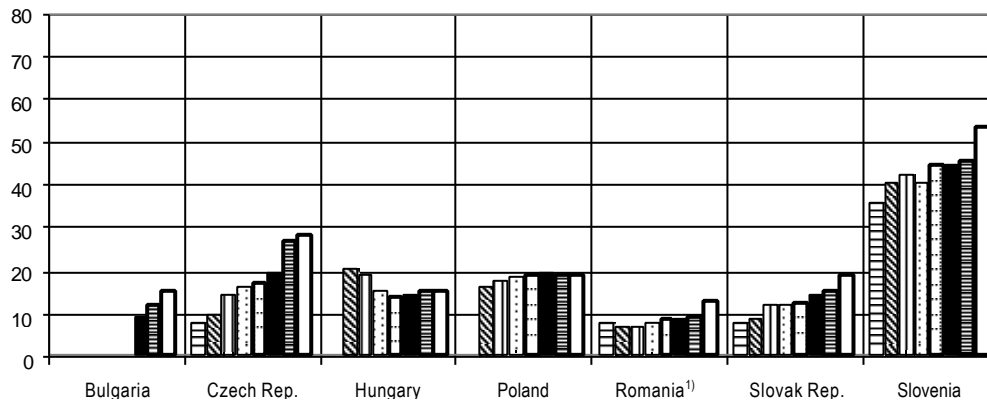
Productivity (PPP)²⁾, Austria 1996 = 100

1991 1992 1993 1994 1995 1996 1997 1998



Unit labour costs (ECU), Austria 1996 = 100

1991 1992 1993 1994 1995 1996 1997 1998



Notes: 1) Net wages; all other countries gross wages. 1994-1998 productivity figures for Romania must be interpreted carefully due to some statistical problems regarding production data at constant prices. -

2) PPP = Purchasing Power Parities.

Source: WIIW Industrial Database.

Looking at the wage level of the rubber and plastic products sector, wages were slightly above the manufacturing average in most CEECs in 1998. Also productivity was some percentage points above manufacturing average, but showed a declining trend in most countries during transition. Hence, unit labour costs were also above the manufacturing average in 1998 in most countries, except in Poland and the Slovak Republic (see Table 7).

Table 7

Rubber and plastic products				
Unit Labour Costs (national currency)				
Manufacturing = 100				
	1992	1995	1997	1998
Bulgaria	119.4	89.4	123.1	114.1
Czech Republic	91.8	100.0	122.5	121.3
Hungary	91.9	82.2	97.5	109.3
Poland	85.3	95.2	90.4	87.9
Romania	82.2	97.0	108.4	106.2
Slovak Republic	83.0	87.8	88.4	99.5
Slovenia	102.6	95.8	89.5	103.5

Source: WIIW Industrial Database.

3 Trade performance with the EU²⁰

Domestic market orientation of the sector, except in the Czech Republic, and high import demand

As an exporter to the EU, the rubber and plastic products sector in the CEECs plays only a minor role due to its overall small size. When compared to its share in production, export shares were somewhat smaller, illustrating the sector's overall domestic market orientation.²¹ The only exception was found in the Czech Republic. In the region, the Czech Republic showed the largest share of rubber and plastic products exports in total manufacturing, accounting for 5% of total manufacturing exports to the EU in 1998,

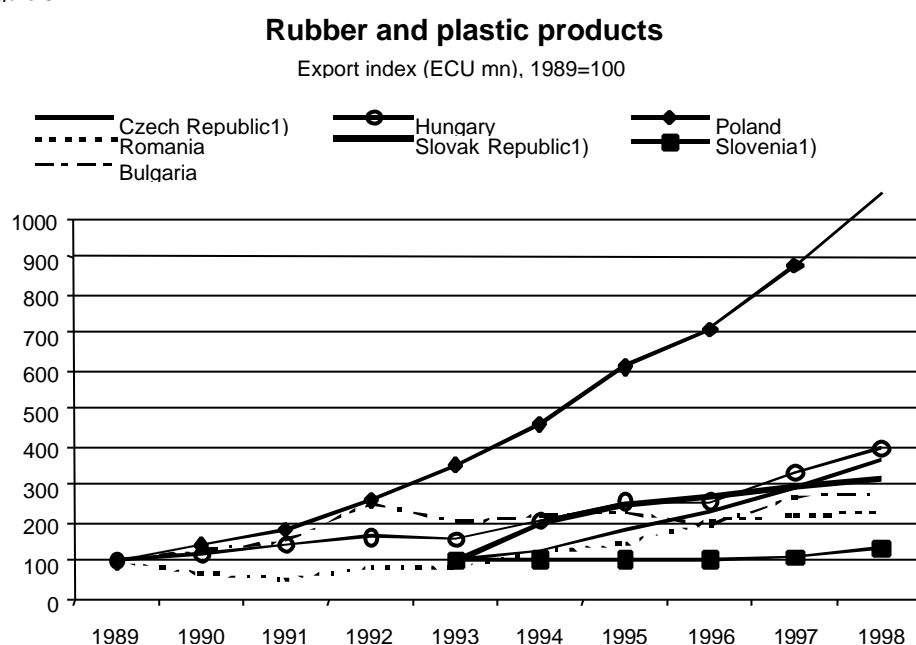
²⁰ Trade with the EU is investigated in more detail because it plays an important role in the CEECs: After the collapse of the CMEA-market, CEEC trade was heavily reoriented towards EU-markets. By 1998, 70% of Hungarian, Polish and Slovenian exports went to the EU(15), for Romania and the Czech Republic the levels were above 60%, for the Slovak Republic somewhat below 60%, and for Bulgaria around 50%. 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 run for a share of 60%, in Slovakia for 50% and in Bulgaria for somewhat less than 50%.

In order to compare data before 1995 with data after 1995, the term EU refers to EU(12) in the following chapter, if not stated otherwise.

²¹ In Hungary, for example, 45% of all rubber and plastic products sales came from exports in 1997, compared to 49% in total manufacturing. However, differences existed within the sector: While the export-orientation of rubber products stood at 60%, it was only 40% in plastic products. In general, export orientation of tyre producers is particularly pronounced.

followed by Slovenia, Poland and Slovakia with 3%. In Hungary, the rubber and plastic products sector had a share of 2%, while in Bulgaria and Romania it reached only 1% (see Appendix, Table A3 and Figure A2). As export growth was larger in the sector than in total manufacturing, export shares grew in the Czech Republic and Poland since 1993 and 1989 respectively. On the other hand, export shares declined in Bulgaria, the Slovak Republic and Slovenia, while they stagnated in Hungary and Romania. Exports grew fastest in Poland (from a low level) and reached 1000% of the 1989 level in 1998. In the Czech Republic, as in Hungary and Slovakia, exports increased to over 300% of the 1989 level (see Figure 5). However, in absolute terms, the Czech Republic exported most rubber and plastic products in the region to the EU (see Table 10 below).

Figure 5



Notes : 1) Export data for the Czech and Slovak Republics and Slovenia since 1993, 1993 = 100.

Source: WIIW Database.

Rubber and plastic products imports from the EU accounted for a small share of CEECs' imports from the EU, but were larger than export shares: In 1998, the largest share was recorded in the Czech Republic, with about 7% of all manufacturing imports being rubber and plastic products. It was followed by Poland and Slovenia, where the sector held 6%, and Slovakia, with 5%. In Hungary and Bulgaria, rubber and plastic products imports amounted to 4% of all imports and in Romania to 3%. During transition, import growth was higher in the rubber and plastic products sector than in total manufacturing, so that by 1998 shares were larger than at the beginning of transition (see Appendix, Figure A2). This was due to the pent up demand for plastic products following the collapse of communism, such as in packaging, and the continuous replacement of other material by plastic. Large

imports are also due to the high specialization within the industry, leading to a large amount of intra-industry trade and imports of products not produced domestically.

In absolute terms, higher imports than exports in the rubber and plastic products sector led to a sectoral trade deficit in all CEECs over the whole time period from 1989 to 1998. This deficit was rather low in Bulgaria, Romania, Slovakia and Slovenia in 1998, where it ranged between ECU 60 mn in the first country to ECU 140 mn in the last one, while the sectoral deficit reached about ECU 300 mn in Hungary and the Czech Republic. The sectoral deficit grew constantly in Poland and nearly approached ECU 1 bn in 1998 (see Appendix, Figure A2).

Export and import trade patterns

At a more detailed three-digit NACE-level,²² half of all rubber and plastic exports from Bulgaria, the Czech Republic, Hungary and Poland to the EU were **rubber products** in 1998, the other half processed **plastic products**.²³ In Romania, the Slovak Republic and Slovenia this ratio was 60:40 (see Table 8). When compared to 1989, the share of rubber products exports was smaller in 1998 than in 1989, that of processed plastic larger (with the only exception of Slovakia, where the share of rubber exports continuously increased since 1993). There was, however, no steady trend over time and shares fluctuated, with the share of rubber exports increasing again slightly in 1998 over 1997.

Table 8

Detailed export and import structure of the rubber and plastic products sector, 1998

Export structure	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
481 Rubber products	49.8	51.1	53.4	50.2	58.4	62.1	60.4
482 Retreading and repairing of rubber tyres	0.4	1.0	0.1	0.4	0.0	0.1	0.0
483 Processing of plastic	49.8	47.9	46.5	49.4	41.5	37.8	39.6
DH Rubber and plastic products	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Import structure							
481 Rubber products	25.0	23.4	24.5	16.0	19.1	30.8	27.9
482 Retreading and repairing of rubber tyres	1.3	0.3	0.3	0.3	1.6	0.3	0.3
483 Processing of plastic	73.7	76.4	75.2	83.7	79.3	68.9	71.8
DH Rubber and plastic products	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: WIIW Database.

²² NACE 1970 classification, codes 481-483.

²³ Export shares as well as import shares for retreading and repairing of rubber tyres' is very small and hence not mentioned here, see Table 8.

On the import side, imports of processed **plastic products** dominated in all CEECs in 1998 and accounted between 70% of all rubber and plastic products imports in Slovakia and Slovenia, and 80% in Poland and Romania (see Table 8). Generally, shares for rubber product imports were smaller in 1998 than in 1989, that for processed plastic products larger. Again, Slovakia and Slovenia were the only exceptions, as rubber imports attained a larger share in 1998 than in 1993. However, as in exports, some fluctuation in the size of shares existed over time.

Export quality of rubber and plastic products at EU level

In 1989, the export quality of rubber and plastic products exported from the CEECs to the EU, as measured by export unit values (value per kg), lay significantly below the average of total EU imports of rubber and plastic products.²⁴ Probably due to the change in the classification system in 1995, export quality experienced a dramatic surge in all countries in this year, except in Slovenia.²⁵ Hence, exports from all countries reached average EU import-quality standards by 1996 or even lay considerably above, as was the case for Hungarian and Slovak rubber exports. Quality differences between rubber and plastic exports were small, with rubber exports showing slightly higher unit values in most countries, except in Romania (see Table 9).

Table 9

		Rubber and plastic products						
		Price/quality gap indicator ¹⁾						
		Average import quality = 1 ²⁾						
		Bulgaria	Czech Republic³⁾	Hungary	Poland	Romania	Slovak Republic	Slovenia⁴⁾
25.1 Rubber products ⁵⁾	1989	0.505	0.591	0.707	0.576	0.416	.	0.635
	1993	0.390	0.634	0.802	0.556	0.414	0.528	0.837
	1995	1.118	1.251	1.421	1.038	1.070	1.644	0.816
	1996	1.049	1.164	1.359	1.027	1.032	1.311	1.141
25.2 Plastic products ⁶⁾	1989	0.408	0.470	0.514	0.406	0.475	.	0.648
	1993	0.496	0.601	0.702	0.592	0.750	0.591	0.779
	1995	0.886	1.049	1.122	0.970	1.161	1.336	0.786
	1996	1.068	1.079	1.176	0.995	1.236	1.228	1.100

Table 9 (continued)

²⁴ This is reflected in a price/quality gap indicator less than 1, see Table 9. See also Landesmann, M., Burgstaller, J. (1997) and Landesmann, M., Burgstaller, J. (1999).

²⁵ This might be due to the reclassification of the following products to other industries: rubber shoes, sport goods, games and toys, recycling of non-metal waste and scrap in the case of the rubber industry, plastic shoes, medical equipment, plastic furniture and miscellaneous products in the case of plastic products. Hence, these products might have lowered the 1989-1994 export unit values and hence the quality of exports. In Slovenia, on the other hand, these exports might have played only a minor role or already showed a higher quality.

Table 9 continued

Notes: 1) The industry-level weighted price/quality gap indicator is defined as:

$$Q_j^c = \sum_{i \in I(j)} (p_i^c / p_i^{EU}) * sx_i^c$$

p_i^c is the price (per kg) at which country c sells exports of the product item i on EU markets (refers here to the EU 12 markets)

p_i^{EU} is the average price of product item i in total EU 12 imports

sx_i^c is the share of product item i in country c's exports to the EU 12 market and

$$\sum_{i \in I(j)} sx_i^c = 1$$

where I(j) is the set of product items i belonging to NACE industry j. See Landesmann, M., Burgstaller, J. (1997).-

2) Average of total EU-imports (extra+intra).- 3) Until 1992 CSFR.- 4) Until 1990 Yugoslavia. - 5) 1989-1994 data from NACE 1970 group 481, 1995-1996 data NACE rev.1 group 251. - 6) 1989-1994 data from NACE 1970 group 484, 1995-1996 data NACE rev.1 group 252.

Source: Calculations by Burgstaller, J., University of Linz for the WIIW.

Good position on the European market

In 1989, CEEC(6)²⁶ rubber and plastic products exports to the EU(12) had a market share of about 3%, which increased steadily to 9% in 1998 (all shares without intra-EU trade), slightly faster than overall exports: At the beginning of transition, the sector's market shares were the same as of total manufacturing, which also showed a share of 3% in 1989 and grew to 8% by 1998. In the last few years, however, rubber and plastic products exports reached a larger share than that of total manufacturing, up 1%, and thus had a relatively important position in overall EU imports (see Table 10). The most important rubber and plastic products exporting country in 1998 was the Czech Republic, with almost 4% of the EU import market share, followed by Poland, with 2.5%, and Hungary with almost 2%. Rubber and plastic products exports from Slovenia and the Slovak Republic reached 1%, that from Romania and Bulgaria only below 1% (for a comparison to South European countries see Appendix A, Table A4).

Exports from the CEECs(7)²⁷ to Austria, had a decisively larger share on Austria's market than on the EU(12) market, accounting for 35% of Austria's non EU-rubber and plastic imports (world-wide imports without EU) in 1995, climbing to 38% in 1998. In 1998, the most important exporting countries were Hungary, with a market share of 16%, followed by Slovenia with 9%, but a declining market share. Exports from the Czech Republic reached a share of 7%, that of the other countries were smaller (see Table 11).

²⁶ Bulgaria, the Czech Republic, Hungary, Poland, Romania and Slovak Republic. Data for Slovenia are available since 1993 only.

²⁷ CEEC(6) plus Slovenia.

Table 10

Rubber and plastic products

Exports to the EU(12) in ECU mn, market shares in %

	EU(12) extra-EU imports		Bulgaria		Czech Republic ¹⁾		Hungary		Poland	
	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%
1989	6971.9		8.4	0.12	68.1	0.98	60.4	0.87	35.9	0.52
1992	8938.9		21.0	0.24	158.4	1.77	97.8	1.09	92.9	1.04
1996	12353.5		16.1	0.13	375.1	3.04	155.6	1.26	255.1	2.06
1997	14086.6		22.5	0.16	479.6	3.40	201.2	1.43	314.0	2.23
1998	15406.8		23.4	0.15	592.8	3.85	239.9	1.56	383.4	2.49

	Romania		Slovak Republic		Slovenia		CEEC(6) ²⁾		Total Manufacturing CEEC(6) ³⁾	
	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%
1989	21.8	0.31	.	.	.	.	194.7	2.79	9303	2.76
1992	18.0	0.20	.	.	.	.	388.2	4.34	16736	4.43
1996	44.5	0.36	99.0	0.80	117.0	0.95	945.3	7.65	32301	6.52
1997	47.6	0.34	105.4	0.75	123.3	0.87	1170.2	8.31	39611	6.85
1998	49.6	0.32	114.1	0.74	146.5	0.95	1403.3	9.11	47191	7.57

Notes: 1) Until 1992 CSFR. - 2) Including Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovak Republic. - 3) CEEC(6) total manufacturing exports to the EU and their market shares in extra-EU(12) imports.

Source: WIIW Database.

Table 11

Rubber and plastic products

Exports to Austria in ECU mn, market shares in %

	Austria extra-EU(15) Imports		Bulgaria		Czech Republic		Hungary		Poland	
	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%
1995	241.5 ¹⁾		0.3	0.14	17.1	7.10	27.7	11.49	3.5	1.47
1996	386.3		0.8	0.20	28.2	7.31	54.3	14.05	7.6	1.96
1997	438.4		0.6	0.14	27.7	6.32	71.9	16.41	7.9	1.80
1998	506.4		2.5	0.49	34.9	6.89	79.7	15.74	8.8	1.75

	Romania		Slovak Republic		Slovenia		CEEC(7) ²⁾	
	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%
1995	0.2	0.09	5.4	2.24	29.5	12.20	83.9	34.72
1996	0.5	0.12	11.3	2.93	44.1	11.41	146.7	37.97
1997	0.7	0.15	14.7	3.36	48.6	11.08	172.1	39.26
1998	1.7	0.34	16.3	3.22	46.0	9.09	189.9	37.51

Notes: 1) 1995 data for Austria are not strictly comparable to 1996 and 1997 data. - 2) Including Bulgaria, the Czech Republic, Hungary, Poland, Romania, the Slovak Republic and Slovenia.

Source: WIIW Database.

Revealed comparative disadvantage

Revealed comparative advantage values (RCAs)²⁸ in relation to the EU were negative in all CEECs, reflecting the negative trade balance in the rubber and plastic products sector (see Table 12). When compared to total manufacturing as a whole,²⁹ data indicated a comparative disadvantage for the sector in all CEECs in 1998, which was largest for Bulgaria and Romania and smallest for the Czech Republic. It lay in between in the other countries (see Table 13). Within the rubber and plastic products sector interesting differences existed: Rubber products exports achieved the best result within the sector and recorded even a positive trade balance in most CEECs, except in Bulgaria and Romania. On the other hand, the worst position was held by 'retreading and repairing of rubber products', except in Poland and the Czech Republic, where the latter showed a positive value in this sub-branch (see Table 14).

Table 12

Rubber and plastic RCAs				
	1989	1992	1997	1998
Austria	-0.14	-0.14	-0.26	-0.23
Bulgaria	-0.64	-0.18	-0.49	-0.55
Czech Rep.	.	.	-0.24	-0.20
Hungary	-0.18	-0.17	-0.38	-0.38
Poland	-0.49	-0.56	-0.58	-0.54
Romania	-0.03	-0.43	-0.54	-0.56
Slovak Rep.	.	.	-0.17	-0.29
Slovenia	.	.	-0.33	-0.33
Greece	.	.	-0.70	-0.69
Portugal	.	.	-0.43	-0.42
Spain	.	.	-0.17	-0.16

Measured as: $RCA = (\text{exports} - \text{imports}) / (\text{exports} + \text{imports})$.
Source: WIIW calculations.

Table 13

Relative position of rubber and plastic RCAs				
	1989	1992	1997	1998
Austria	-0.01	-0.03	-0.09	-0.08
Bulgaria	-0.10	-0.05	-0.58	-0.56
Czech Rep.	.	.	-0.10	-0.14
Hungary	-0.08	-0.14	-0.33	-0.34
Poland	-0.42	-0.48	-0.31	-0.29
Romania	-0.49	-0.35	-0.52	-0.50
Slovak Rep.			-0.09	-0.28
Slovenia			-0.22	-0.25
Greece	.	.	-0.09	-0.09
Portugal	.	.	-0.21	-0.20
Spain	.	.	-0.03	-0.03

Measured as: $RCA(\text{rubber and plastic products}) - RCA(\text{total manufacturing})$.
Source: WIIW calculations.

²⁸ Measured as $RCA = (\text{exports} - \text{imports}) / (\text{exports} + \text{imports})$.

²⁹ Measured as $RCA(\text{rubber and plastic products}) - RCA(\text{total manufacturing})$.

Table 14

Detailed RCA structure of the rubber and plastic products sector, 1998

	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
481 Rubber products	-0.27	0.19	-0.01	-0.03	-0.08	0.06	0.04
482 Retreading and repairing of rubber tyres	-0.84	0.43	-0.73	-0.52	-0.99	-0.73	-0.93
483 Processing of plastic	-0.67	-0.41	-0.56	-0.70	-0.74	-0.53	-0.57
DH Rubber and plastic products	-0.55	-0.20	-0.38	-0.54	-0.56	-0.29	-0.33

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

Source: WIIW Database.

4 Foreign direct investment

The rubber and plastic products sector, being a small segment of manufacturing, was not a prominent target of foreign investment in absolute terms but, compared to its size, it did attract an over-proportionate investment inflow in the Czech Republic, and an average one in Hungary and Poland. However, there was little FDI inflow in the Slovak Republic and Slovenia by 1996, possibly due to the political situation and cronyism³⁰ in the former country, while foreign direct investment followed later on, especially to Slovenia.³¹

Foreign investment was especially pouring into *tyre production*, as local rubber producers were numerous during the communist regime.³² The world's largest tyre producers (Goodyear from the US, Bridgestone from Japan and Michelin from France) moved into Eastern Europe, drawn by low labour costs (important, because of higher labour intensity), by the geographical closeness to newly established car manufacturers and by a potentially growing number of customers. Foreign investors concentrated on the production of cheap tyres in order to fend off price competition from Asia and Latin America. The most important target was Poland, with its largest and most dynamic car market in Central and Eastern Europe, attracting investment from all three top tyre makers.

In the *plastics industry*, foreign investors were drawn by the growth of domestic demand and the good prospects for the branch. In Hungary, for example, foreign interest prevailed

³⁰ The privatization process was managed with complete disregard for the principles of free market access, the aim was to create a strong domestic entrepreneurial and managerial class, which, however, remained loyal to the government. As a result, foreign investors were deterred. See Lukas (1999), page 5.

³¹ In these countries, foreign investors invested in the tyre industry: Goodyear in the Slovenian Sava Kranj company in 1997, Continental in the Slovakian Matador company only recently. Production of a new Continental tyre plant will start in 2000 in Romania.

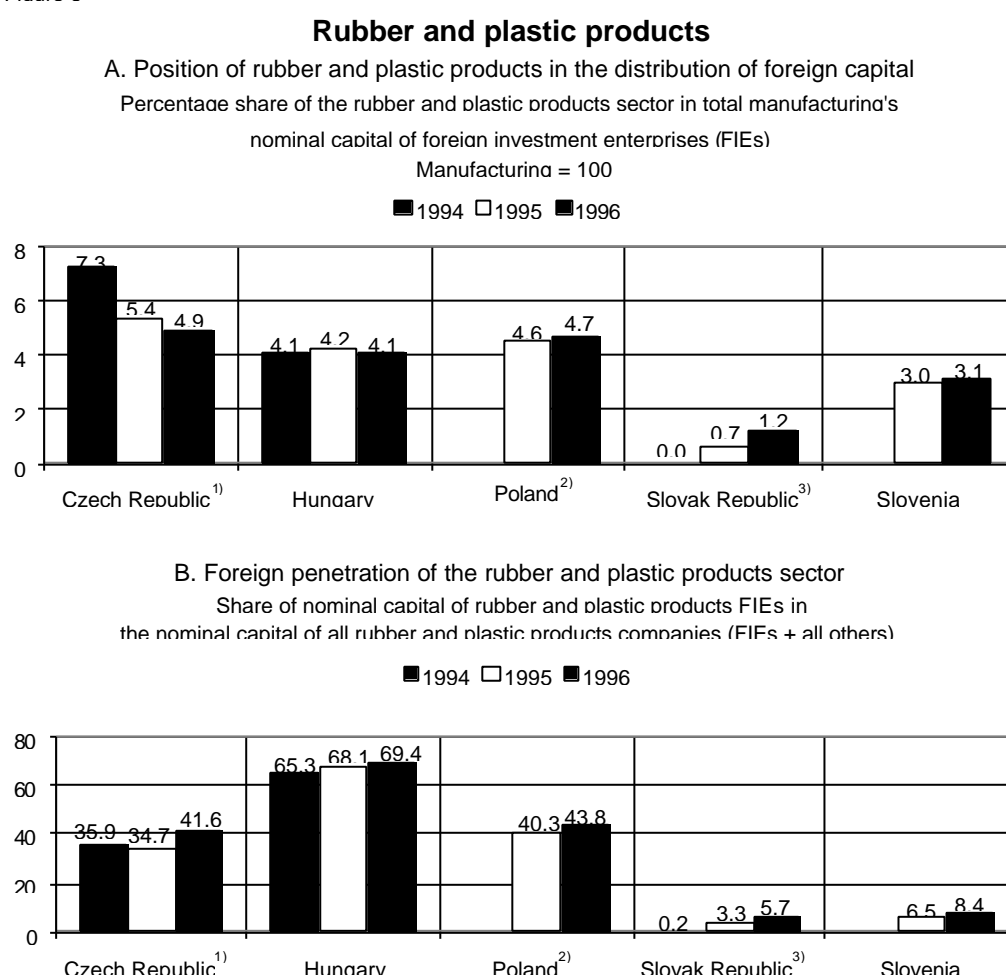
The Austrian company Semperit AG in Traiskirchen, a daughter company of Continental, faces severe competition from foreign direct investment in its neighbouring countries, suffering employment lay-offs and production reductions because of Barum Continental in the Czech Republic. It now even fears plant closure due to the new plant in the Slovak Republic. Presse (1999), 22. Dezember and Presse (1999), 27. April.

³² See Financial Times (1999), September 16.

primarily for large companies, In addition, joint ventures in the category of small- and middle-sized companies were also set up. The main focus lay in the production of packaging materials, tubes and household plastic articles.³³

In Figure 6 the difference between two country groups becomes clearly visible. Looking first at the shares of the rubber and plastic products sector in the distribution of the nominal capital of all foreign investment enterprises (FIEs)³⁴ in total manufacturing, the share was generally small in all CEECs and stood at 4% in Hungary and at 5% in the Czech Republic and Poland, but ranged only about 1% in the Slovak Republic and 3 % in Slovenia in 1996 (see Figure 6A).

Figure 6



Notes: 1) Own capital. - 2) Polish data from Zagozdzińska, I. (1998) and Polish Statistical Yearbook of Industry (1997). - 3) Output of companies.

Source: WIIW Database.

³³ See Ministry of Economic Affairs (1998), page 8.

³⁴ Firms with any share of foreign ownership, including minority stakes.

Foreign penetration of the rubber and plastic products sector (as measured by the share of the nominal capital of the sector's FIEs in the nominal capital of all rubber and plastic products companies) was above average levels of foreign penetration for total manufacturing in the Czech Republic, Hungary and Poland, but below in Slovakia and Slovenia. In 1996, foreign penetration in the region was highest in Hungary, with about 70% of the nominal capital in the sector being that of FIEs, followed by Poland and the Czech Republic, with 44% and 42% respectively. In Slovenia, foreign penetration reached 8% and in the Slovak Republic 6%, up from zero per cent in 1994 (see Figure 6B).

5 Prospects

In general, the development of the rubber and plastic products sector follows the cyclical movements and trends of the overall economy. It is therefore not surprising that the sector developed best in the most advanced CEECs – Poland, Hungary, and also Slovenia (see Table 15). The *Polish* rubber and plastic products sector emerged as the growth leader in the region, combined with dynamic employment effects and a huge growth of exports (however, from a low level). This favourable trend was supported by the inflow of foreign direct investment, which was attracted by the huge domestic market in particular and the good future prospects of the sector in general. However, the expansion of the sector was followed by a high inflow of imports, leading to a growing sectoral trade deficit. In *Hungary*, the sector experienced mostly the same positive trends as in Poland, and was additionally supported by high productivity and falling unit labour costs. Exports to Austria are of particular importance. In *Slovenia*, the rubber and plastic products sector has an important position in manufacturing, but showed a less dynamic development during transition than in the other two countries, possibly due to lower inflow of foreign direct investment and a production decline in the automobile industry.

In the *Czech and Slovak Republics*, production levels of the rubber and plastic products sector are still below that of 1989 – probably influenced by problems in the overall economy, including an inefficient privatization method and the heavy indebtedness of large companies. Nevertheless, Czech rubber and plastic products exports hold the largest share of all CEECs on the European market, due to the export orientation of the sector in this country; in Slovakia, the sector shows a comparatively high level of productivity.

In *Bulgaria and Romania*, the development of the rubber and plastic products sector lags behind that of the other CEECs, due to the slower overall economic development. However, there is high potential for future improvement, as pent-up demand will reveal itself in a better economic situation. In particular, Romania's rubber and plastic products sector shows good prospects, reflected in the inflow of foreign direct investment recently observed in tyre companies and in the building-up of a domestic tyre industry and the downstream automobile industry.

In general, the rubber and plastic products sector has **very good future prospects** throughout the region as major demand segments already surfaced or will reveal themselves in the future. Tyre production is closely related to the transport equipment sector, which is a very successful segment of manufacturing. Demand for plastic packaging is expected to grow in the future, as well as demand from the construction industry, which still has to respond to pent-up demand for housing. The electric and optical equipment sector, another important customer of rubber and plastic articles, and the transport equipment sector are 'the two most promising future segments' of manufacturing, facing high growth. However, the future development of the rubber and plastic products sector might be constrained by environmental considerations, as a possible EU accession requires the adaptation to EU standards. Hence, further restructuring, modernization and specialization will be needed to face future challenges.

Table 15

Developments in GDP and gross industrial production

real change in % against preceding year

	Gross domestic product				Gross industrial production			
	1998	1999	2000 forecast	2001	1998 ¹⁾	1999 ²⁾	2000 forecast	2001
Czech Republic	-2.3	-0.6	1.5	2	3.1	-3.0	2	2
Hungary	4.9	4.0	4.5	5	12.5	9.0	10	11
Poland	4.8	4.1	4.5	5	4.7	4.4	5	6
Slovak Republic	4.4	2.0	0.0	2	5.0	-5.0	-1	0
Slovenia	3.9	3.7	3.7	4	3.7	-1.0	2	2
Bulgaria	3.5	2.5	4	4	-12.7	-10.0	4	4
Romania	-5.4	-3.9	0	1	-16.8	-8.0	0	2

Notes: 1) Preliminary. - 2) Estimate.

Source: WIIW (January 2000).

Part II: COMPANY PROFILES

Bulgaria

Selected companies in the Bulgarian rubber and plastic products sector include:

- Vidachim: The only Bulgarian tyre maker is loss-making, not able to compete with cheap imports and currently in liquidation. The company reported net sales of 37 bn Bulgarian lev (BGL) in 1998 and employed about 4,200 persons.
- Kauchuk: Founded in 1930 as a Bulgarian-Belgian association, Kauchuk is the largest manufacturer of rubber goods, such as conveyor belts, rubber-textile hoses, bicycle, moped and motorcycle tyres and tubes, and other technical rubber goods. In 1998, the company reported net sales of BGL 39 bn and employed 1,400 persons.
- Asenova Krepost: The company produces plastic films for the packaging of agricultural products and dominates the Bulgarian market. The company reported net sales of BGL 40 bn in 1998 and employed 1,600 persons.
- Plasthim: The company employs about 900 persons and produces wallpapers and floor coverings among others. Currently 80% of the company's capital is offered for cash privatization.

Czech Republic

The Czech rubber and plastic products sector has experienced a rapid increase in production and sales revenues in the last few years. In 1997, 31.5% of all sales revenues were accounted for by the *rubber industry*, while 68.5% came from the *plastics industry*. Privatization of both industries is completed. High and above-average growing domestic demand cannot fully be met by domestic supplies and thus has to be covered by increasing imports, especially of plastic products.³⁵ In addition, also special raw materials, such as chemicals and additives, have to be imported.

In 1998, the rubber and plastic products sector consisted of 400 companies with 20 or more employees, out of which about 90 had more than 100 employees, and only one had more than 2000 employees (Barum Continental, see below).³⁶ Investment in the sector totalled about 5.6 bn Czech koruna (CZK) in 1998, representing 5% of total manufacturing investment. The investment growth rate reached 19% in that year and ranked second only behind the wood and wood products sector. The return on equity was remarkable for about 59% of all companies, good for 10%, less good for 18% and bad for 13% in the first three

³⁵ In more detail, mainly imports of group 25.21 were rising, including tubes, hoses, boards, sheets, films, and other plastic products. For a detailed description see Ministry of Industry and Trade (1999), p. 176 and the Internet Homepage (www.mpo.cz/english/g/gc/9901/page0010.htm).

³⁶ However, as illustrated by the examples of Hungary and Slovakia, one can assume that there is a large number of smaller companies with less than 20 employees active in this sector in the Czech Republic as well.

quarters of 1999.³⁷ Hence the sector showed a comparatively good overall picture. The financial situation of companies with 100 or more employees was also quite sound, contributing 11% to total manufacturing profits in 1998. Of these, 68 enterprises made a profit totalling CZK 3.6 bn in 1998, while 21 made a loss of CZK 600 mn.³⁸

Demand growth and good future prospects attracted a number of *foreign investors*, the largest being Continental from Germany (tyres, see below), PLM AB from Sweden (producer of plastic bottles), Showa Plastics from Japan (producer of plastic parts), Löffler Kunststoffwerk from Germany (plastics), DK Industriebeteiligungs Ges.m.b.H. from Germany (plastics), Johnson Controls from the USA (producer of plastic bottles), Semperit from Austria (rubber hoses)³⁹, Schutterveld from the Netherlands (plastic parts) or Textron from the USA/Germany (plastic bottles).⁴⁰

Selected manufactures in the Czech rubber and plastic products sector, ranked by 1998/1997 revenues, include:

- Barum Continental, spol.s.r.o.: Originating from the shoemaking company Bata, the company started tyre production in 1932. The trade mark of Barum was registered in 1948 and got its name from the first letters of the tyre producers Bata, Rubena and Mitas. After the collapse of communism, a joint venture with the German Continental company was formed in 1993, which acquired a 70% stake in Barum. The rest is held by Korso, a joint venture between Continental and Michelin.⁴¹ Continental was attracted by the skilled workforce and engineering experience, low labour costs, the Barum brand name well known in the CEECs, and its wide distribution network.⁴² The German company also followed a relocation strategy, closing plants in the West and transferring production to low-cost countries.⁴³

Today Barum is the largest automotive tyre producer in Europe, producing more than 10 million tyres per year and reporting sales of CZK 11 bn (EUR 312 mn) in 1998. The company employs about 3,900 persons, the same number as in 1990. It produces a

³⁷ Compared to 44%, 6%, 23% and 28% in total manufacturing. Remarkable meaning $ROE > r_e$, good meaning $ROE > r_f$, less good meaning $ROE > 0$ but smaller than $> r_f$, and bad meaning that $ROE < 0$, with r_e = interest rate for opportunity costs and r_f = interest rate without any risk.

³⁸ In detail, the rubber industry shows a positive overall picture, particularly due to the tyre production of Barum Continental. Production of technical rubber products as well as plastics products is less competitive. The plastics industry is less developed in terms of technology and production range in comparison to the more advanced countries of Western Europe. Hence, imports are also relatively high in these two branches. See ASPEKT (1998).

³⁹ Not to be confused with the tyre producer Semperit, which is a subsidiary of the German company Continental.

⁴⁰ Data as of January 1999. CzechInvest (1999).

⁴¹ Without the help of a strategic partner the company might have gone bankrupt. Wesolowsky (2000), p. 4.

⁴² Barum took over the network of Motokov, the former monopoly exporter of Czech tyre and rubber products. *Business Eastern Europe* (1996), 2 September.

⁴³ Continental closed its plant in Ireland and the United Kingdom and reduced production in Germany and Austria. It has production plants in Portugal, Mexico and Slovakia and further plans for Hungary and Romania. See Wesolowsky (2000), p. 2.

broad assortment of tyres, including passenger, utility, truck, agricultural and special tyres not only under its own brand name but also using others.⁴⁴ From these, about 70% are exported, mainly to EU countries and the USA, making Barum one of the largest and most successful Czech exporters. The company is a main supplier to the Volkswagen group, including Škoda Auto on the domestic market.

- Ceská Gumárenská Společnost a.s.: Ceská Gumárenská Společnost is considered the largest group in the rubber industry and includes a number of companies in which it has a majority stake of more than 50%. These include Mitas (tyres for off-road vehicles), Rubena (tyres, technical rubber, 2,000 employees), Buzuluk (machinery), Beltyr (tyres), Eko-Rubber (technical rubber products), or Gumokov (technical rubber products). In 1998, the group reported revenues of CZK 6 bn and an employment of 6,500 persons.
- Kaucuk, a.s.: Kaucuk reported revenues of CZK 6 bn in 1997 and employed about 2,100 persons. It is specialized in polystyrenes and synthetic rubbers and exports about 75% of its output to Germany, Italy, Poland, Austria and Slovakia. It is 100% owned by the petrochemical holding Unipetrol.
- Peguform Bohemia Liberec: The producer of injection moulded products for the automobile industry reported revenues of approximately CZK 3 bn in 1997.
- Gumotex Breclav: The producer of plastic semi-finished and final products reported revenues of about CZK 2.1 bn in 1997 and employed about 1,700 persons.
- Fatra, a.s., Napajedla: The producer of foils, flooring and conveyor belts reported revenues of about CZK 1.8 bn in 1997 and employed about 1,600 persons, a number constantly decreasing in recent years. The company exports about 19% of its output, 55% of which go to Slovakia, and is owned by the Chemapol Group, with 77%.
- Technoplast Chropyne: The producer of imitation leather, flooring, coating materials and PET foils reported revenues of about CZK 1.6 bn in 1997.
- Granitol, a.s.: Granitol reported revenues of CZK 80 mn in 1997 and employed about 400 persons. It is specialized in plastic products (foils) and exports 29% to Slovakia, Germany and Poland.

Hungary

In 1997, the output of the Hungarian rubber and plastic products sector (accounting for 4% of total manufacturing output) was made up by the *rubber industry*, with 22%, and the *plastics industry*, with 78%.

The export orientation of the sector has been close to the manufacturing average of 49%; the *rubber industry* showed a higher export orientation than the *plastics industry* (60% as compared to 40%, see Table 16).

⁴⁴ However, the Barum brand is used for lower quality tyres.

In 1997, there were about 1,000 active companies with legal entity in the whole rubber and plastic products sector, representing 5% of all manufacturing corporations in Hungary. Of these, 68% of firms had less than 11 employees, 31% employed between 11 and 300 persons, and just 1% had more than 300 employees. In terms of legal form, 93% of all active corporations in the sector were private limited liability corporations, and just 3% were public-limited liability companies (31 firms). In addition, about 670 unincorporated businesses (i.e. those without legal entity) existed in the rubber and plastic products sector, including different forms of partnerships and accounting for 4% of all unincorporated manufacturing businesses. The number of sole proprietors reached 1,300 in 1997, making up 3% of all manufacturing sole proprietors.

Overall, the sector achieved a moderate operating surplus of 22 bn Hungarian forint (HUF) in 1996, accounting for only 4% of total manufacturing surplus.

Table 16

**Hungary: Gross output, total sales and export sales
in the rubber and plastic products sector**

	Gross output		Total sales	Export sales	Export sales/ Total sales
	1997 HUF mn	1997 %	1997 HUF mn	1997 HUF mn	1997 %
251 Rubber products	41528	22.2	40730	24520	60.2
252 Plastic products	145444	77.8	143899	57697	40.1
25 Manufacture of rubber and plastic products	186972	100.0	184629	82217	44.5

Notes: Hungarian Classification.

Source: Yearbook of Industry and Construction Statistics Hungary (1998).

In the *tyre industry*, the French company Michelin has two sites in Hungary (Taurus) and Continental shows interest in investing in the country.

Selected companies in the Hungarian *plastics industry* include:⁴⁵

- Tiszai Vegyi Kominát, Plastic Processing Profit Centre (TVK MPC): TVK Rt., a major Hungarian chemical company, used to organize its plastic products production in a single site with large manufacturing capacities. At the end of 1995, it established four divisions, the Flexofo, Biafol, Agroplast and Formplast division. TVK also owns the majority of Tiszatextil Kft., a producer of a broad range of packaging materials, which was separated from TVK in 1991.
- Pannonplast Rt.: Pannonplast is a strategic holding company, including 18 independent entities (16 limited liability companies, two limited by shares, but only 13 plastic

⁴⁵ According to the Ministry of Economic Affairs (1998).

processors), making it the largest plastic group in Hungary. The main companies include Pannonpipe Müanyagipari Kft, the largest Hungarian producer of plastic pipes, Pannunion Csomagolóanyag Kft, producer of packaging materials, and LG Pannon Müanyagipari Rt., manufacturer of PVC foil and PVC floor with South Korean participation. Foreign investment was coming into the group, of which 6 companies are already joint ventures. However, Pannonplast itself is active in the East, having two green-field production sites in Romania for food packaging and pipe-production and one in the Ukraine. In early 2000, Pannonplast acquired TVK's plastics unit.

- Graboplast Rt.: Founded as a synthetic leather and textile manufacturer in 1905 and 1923 respectively, Graboplast was transformed into a corporation in 1990 and Creditanstalt – an Austrian bank – bought 30% of the company. It was finally privatized in 1994 and traded on the Budapest Stock Exchange. In 1996, it was reorganized as a holding company and Grabo Kft. took over the production activities. The product range of the group shifted from the traditional business to home improvement products, such as wallpapers, PVC floors or carpets. In 1998, Graboplast acquired the Romanian wallpaper factory Grabetta-Torda.
- Borsodchem Rt.: The Hungarian chemicals company restructured its plastic production and established single entities, wholly owned by Borsodchem. Ongropack Müanyagfojl Gyártó Kft. produces PVC foils, sheets and packaging materials, Grafol Kft. hard and soft extruded products, and BC Ablakprofil-gyártó Kft. window profiles.
- Miskolci Müanyag-feldolgozó Rt.: The company is the largest Hungarian producer of plastic garden furniture.
- Pest megyei Müanyagipari Rt. (PEMÜ): The production range of the company comprises injection moulds, components for the shoe industry, large injection moulded items, pipes and special engineering plastic products.

Foreign investors were highly interested in the Hungarian plastic industry and major 100% foreign-owned companies include ALPLA Kft., PORAN Kft, KNU Csomagolóanyag-gyáarak Kft, or WAVIN-PEMÜ Kft.

Growth prospects of the plastics industry might arise in the tube subsector (due to improvement needs in the sewage disposal systems with EU accession), in container production (due to increased PET bottles production), in PVC windows (due to the general replacement trend), and in the automotive industry. On the other hand, the prospects of floor production are less good, as production has been declining for years. Hence, Graboplast, for example, tried to counteract by expanding its product range.⁴⁶

⁴⁶ Ministry of Economic Affairs (1998), p. 6.

Poland

In 1998, the Polish rubber and plastic products sector comprised 440 enterprises with 50 or more employees, representing 5% of all manufacturing companies. Herein, the *rubber industry* accounted for 14% of the sector's companies, but 32% of sold production and 31% of all employees, while the *plastics industry* accounted for more than 86% of companies, 68% of sold production and 69% of employees.⁴⁷

The rubber and plastic products sector experienced a rather favourable development over the last few years, with net profitability and investment growth being remarkably above total manufacturing average (see Table 17).

Table 17

Poland: Net profitability in the enterprise¹⁾ sector and real growth rates of investment outlays, in %

	Net profitability ²⁾				Investment growth (real)			
	1996	1997	1998	I-IX 1999	1996	1997	1998	I-IX 1999
25 Rubber and plastic products	4.6	5.6	5.5	5.6	46.0	49.9	26.1	0.8
D Total manufacturing	2.3	2.3	1.2	0.7	32.7	38.2	30.9	-2.2

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

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

Foreign investors were attracted by the large domestic market and capital invested in the sector amounted to USD 444 mn in February 1999, representing about 3% of capital invested in total manufacturing.⁴⁸ Major foreign investors in the Polish rubber and plastic products sector include:⁴⁹

- Michelin, France (47): The French tyre company invested USD 136 mn so far and plans for further USD 151 mn. Investment went into the tyre factory Stomil Olsztyn S.A. and into Michelin Polska Sp.z.o.o..

Stomil Olsztyn, under communism producer of mainly truck, light truck, van and agricultural vehicle tyres, also went into the production of tyres for passenger cars after the acquisition of shares by Michelin in 1995, which currently holds 52% of shares. Stomil Olsztyn remained the largest manufacturer of truck and agricultural tyres in

⁴⁷ All data referring to companies with 50 or more employees.

⁴⁸ Polish Agency for Foreign Investment (PAIZ) Homepage (<http://www.paiz.gov.pl/invest0699pr.html>)

⁴⁹ See PAIZ (1999). The number in brackets indicates the rank of the company in the List of Major Foreign Investors in Poland 1998, according to the sum of foreign investment. This includes contributed equity, medium- and long-term loans granted by foreign investors to companies established by them and the value of re-invested profits reduced by the dividend exported.

Poland. In 1998, it reported revenues of USD 260 mn, employed 4,000 persons and exported about 43% of its sales.⁵⁰

- Goodyear Tire and Rubber Company, USA (55): The US tyre company invested USD 112 mn so far and plans for further USD 55 mn. It owns 60% of the tyre manufacturer Debica S.A..

Under the communist system, Debica S.A. was the monopoly producer of passenger car tyres, but also went into the production of van and light truck tyres, after Goodyear acquired majority shares in 1996. It is still the largest producer of passenger tyres in Poland, with 60% of the domestic market. In 1998, the company reported revenues of USD 470 mn, employed about 5,000 persons and exported about 53% of sales.

- Bridgestone Corporation, Japan (122): The Japanese tyre company invested USD 45 mn so far in a new tyre plant, jointly owned by Bridgestone Firestone Poland in Poznan (83%) and the Polish tyre manufacturer Stomil Poznan.
- Nordisk Wavin A/S, Denmark (160): The Danish company invested USD 32.5 mn so far in Wavin Metalplast-Buk Sp.z.o.o., producer of plastic frames.
- Rubbermaid Inc, USA (225): The US company invested USD 19.5 mn so far and plans for another USD 3.5 mn. It acquired 90% of shares of Dom-Plast.
- Granges AB, Sweden (228): The Swedish company invested USD 19 mn so far in Plastal Gliwice.
- Manuli Rubber Industries, Italy (253): The Italian company invested USD 16 mn so far and has plans for a further USD 3 mn. Investment went into Manuli Auto Polska, producer of rubber and metal parts for fluid transmission and hydraulic systems.

Romania

Selected companies in the Romanian rubber and plastic products sector include:

- Tofan Grup: Called after the businessman Celu Tofan, the Tofan Grup is today Romania's largest tyre producer and the only company in the region in majority local ownership. It is organized as a holding company and controls two thirds of the Romanian tyre industry, which is its main market. Starting with distribution, Mr Tofan built a green-field retreading plant later and acquired 51% of Danubiana S.A. – the former largest tyre maker – in 1995. In 1997, the purchase of majority stakes in two factories followed (car-tyre maker Victoria, truck-tyre maker Silvania). In the same year Nomura International became a strategic partner, acquiring a 29% stake. In addition, a long-term production agreement was signed with Titan Tyre from the US.⁵¹ Supplying to Dacia under foreign ownership means improvement of quality and upgrading of facilities.⁵²

⁵⁰ *Central European Economic Review* (1999), July-August, p. 19.

⁵¹ *Business Eastern Europe* (1997), 27 October.

⁵² *Business Central Europe* (1998), March.

- Continental, Germany: The German tyre company is building a new plant in Timisoara for the production of passenger tyres, attracted by generous tax incentives. The new plant is said to employ about 1,000 persons and should start production at the end of 2000.

Slovak Republic

At the end of 1999, there were about 400 companies in the rubber and plastic products sector as a whole in Slovakia, accounting for 5% of all manufacturing companies. Of these 99% were in private hands, 73% had fewer than 20 employees, 24% between 20 and 500 employees, and only 1% above (4 companies) with more than 1000 employees.

The rubber and plastic products sector belonged to the few sectors of manufacturing making a profit before taxation. However, this profit declined from 1996 and reached only 140 mn Slovak koruna (SKK) in 1998.⁵³

Main producers of the Slovak rubber and plastics products sector include:

- Matador, a.s., Púchov: Founded in 1905 as a rubber and belt factory, Matador today produces tyres. In 1998, the company reported net revenues of SKK 7 bn, of which 80% came from exports, and employed about 3,900 persons. In 1999, it established a joint venture with the German company Continental to produce truck tyres in a new plant in Púchov. Continental hence plans to close a Western plant instead, fuelling fears at Semperit, the Austrian tyre subsidiary of Continental.
- Plastika, a.s., Nitra: The plastic pipe and packaging manufacturer reported net revenues of SKK 1.5 bn in 1998, of which 38% came from exports, and employed 1,200 persons.
- Vegum, a.s., Dolné Vestenice: The rubber company reported net revenues of SKK 900 mn in 1998, of which 68% came from exports, and employed about 1,000 persons.
- Contitech Vegum, s.r.o., Dolné Vestenice: The producer of extrusions for sealingsystems reported net revenues of SKK 470 mn in 1998, of which 93% came from exports, and employed about 500 persons. The company belongs to the German Contitech Holding GmbH, a specialist in rubber and plastics technology.
- Contitech Vegum Vibration Control, s.r.o.: The producer of moulded articles for vibration control reported net revenues of SKK 260 mn in 1998 and belongs to the German Contitech Holding GmbH.

⁵³ This figure includes enterprises with 20 or more employees, but also with less than 20 employees if the yearly turnover of the company was higher than SKK 100 mn.

Slovenia

In 1998, total revenues of the rubber and plastic products sector in Slovenia measured about 140 bn Slovenian tolar (SIT), with the *rubber industry* accounting for 46% of the sector's revenues and the *plastics industry* for the remaining 54%. However, only 40% of employees were employed in the *rubber industry*, while 60% were engaged in the *plastics industry* in 1997.

Over the last few years, the *plastics industry* experienced a boom in production and sales, due to the growth of small companies as a result of the underdevelopment of that sector in the former Yugoslavia. The fastest growing companies are manufacturers of plastic windows, which are more and more replacing wooden windows. In order to fend off competition from larger plastics producers offering low prices and better buying conditions, these small companies try to specialize, and improve quality and efficiency. There are still a lot of open opportunities on the market for future growth.⁵⁴

- Sava, d.d.⁵⁵ Founded in 1920 as a manufacturer of rubber products in Kranj, Sava expanded its product range to conveyor belts, v-belts, automobile tyres and inner tubes after the Second World War. In 1967, a licence agreement was signed with Semperit from Austria, which later became a daughter company of Continental/Germany, to produce diagonal tyres. In 1971, the co-operation was extended to a joint venture manufacturing radial tyres. After the break-up of the former Yugoslavia, Sava turned into a joint stock company, having as much as 42,000 shareholders. In 1995, the co-operation with Semperit ended, paving the way for a new co-operation with the US company Goodyear. At the end of 1997, two joint ventures were founded. The first one, Goodyear Engineered Products Europe, d.o.o., is 75% owned by Goodyear, while Sava transferred its air springs and v-belt product line. The engineered rubber producer has about 500 employees. The second one, Sava Tires, d.o.o., is 60% owned by Goodyear and launched tyre production in July 1998. The company employs about 2,000 persons.

In 1999, rubber and chemicals producer Sava, d.d. reported sales of SIT 9.2 bn (EUR 46.7 mn), and employed about 1,300 persons (1998). It exports about 70% of its production, mainly to Croatia, the USA, Italy, Hungary, Germany, the UK, the Czech Republic and Poland and thus is not only one of the largest Slovenian companies but also one of the largest Slovenian exporters.

⁵⁴ *Slovenian Business Report*(1998), Winter, p. 10 and *Slovenian Business Report*(1999), Winter, p. 21.

⁵⁵ Sava Internet-Homepage (www.sava.si) as of 12 January 2000.

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Appendix of Tables and Figures

Table A1

Key data on total manufacturing

		1989	1992	1993	1996	1997	1998	Average growth in % 1993-1998
BULGARIA								
Industrial production (at current prices)	in BGL mn	59320	189449	212700	1527399	13510638	12673772	.
Industrial growth (at constant prices)	in %	.	-17.2	-12.6	.	-12.0	-17.2	.
Employment	in 1000	1420	883	767	741	720	665	.
Employment growth	in %	.	-16.3	-13.2	.	-2.7	-7.6	.
Wage growth (ECU basis)	in %	.	46.0	44.5	.	-1.9	28.4	.
Productivity growth	in %	.	-1.0	0.7	.	-9.5	-10.4	.
ULC growth (ECU basis)	in %	.	47.5	43.6	.	8.4	43.3	.
Total exports to EU	in ECU mn	394	757	779	1447	1772	1896	16.5
Total imports from EU	in ECU mn	1316	971	1158	1401	1492	1863	11.5
Trade balance with EU	in ECU mn	-921	-214	-380	46	280	33	.
Exports to the EU: Market shares	in %	0.12	0.20	0.20	0.30	0.31	0.31	.
CZECH REPUBLIC								
Industrial production (at current prices)	in CZK mn	558351	652893	655289	894694	1330877	1442259	.
Industrial growth (at constant prices)	in %	.	-8.0	-8.4	4.7	7.6	3.6	2.5
Employment	in 1000	1658	1181	1098	983	1170	1140	.
Employment growth	in %	.	-13.2	-7.0	-3.4	-2.5	-2.6	-3.8
Wage growth (ECU basis)	in %	.	20.0	33.7	17.0	8.2	10.6	16.8
Productivity growth	in %	.	6.0	-1.5	8.3	10.4	6.4	6.6
ULC growth (ECU basis)	in %	.	13.2	35.7	8.0	-2.0	4.0	9.6
Total exports to EU	in ECU mn	.	.	4385	7950	9660	11796	21.9 ¹⁾
Total imports from EU	in ECU mn	.	.	5613	11409	12885	13259	18.8 ¹⁾
Trade balance with the EU	in ECU mn	.	.	-1228	-3460	-3225	-1463	.
Exports to the EU: Market shares	in %	.	.	1.13	1.61	1.68	1.90	.
HUNGARY								
Industrial production (at current prices)	in HUF mn	146110	1497321	1721479	3827038	5197367	6615642	27.2
Industrial growth (at constant prices)	in %	.	-17.4	3.0	3.0	15.9	18.0	9.1
Employment	in 1000	1171	857	747	633	637	659	.
Employment growth	in %	.	-14.5	-12.9	-2.9	0.7	3.4	-4.3
Wage growth (ECU basis)	in %	.	14.5	18.4	3.7	10.8	2.3	5.5
Productivity growth	in %	.	.	18.2	6.2	15.2	14.1	14.0
ULC growth (ECU basis)	in %	.	.	0.2	-2.4	-3.8	-10.3	-7.4
Total exports to EU	in ECU mn	2177	3548	3522	6605	8981	11213	21.1
Total imports from EU	in ECU mn	2665	3738	4585	7382	10092	12236	21.9
Trade balance with the EU	in ECU mn	-488	-189	-1063	-778	-1111	-1023	.
Exports to the EU: Market shares	in %	0.74	0.94	0.90	1.33	1.55	1.80	.
POLAND								
Industrial production (at current prices)	in PLN mn	.	78975	104441	244193	299825	334887	27.2
Industrial growth (at constant prices)	in %	.	4.9	10.2	9.8	13.3	5.3	10.7
Employment	in 1000	3326	2767	2700	2803	2821	2801	.
Employment growth	in %	.	-13.1	-2.4	-0.2	0.7	-0.7	0.2
Wage growth (ECU basis)	in %	.	2.6	13.8	18.2	11.1	8.5	12.4
Productivity growth	in %	.	.	12.9	10.1	12.5	6.1	10.5
ULC growth (ECU basis)	in %	.	.	0.8	7.3	-1.3	2.3	1.7
Total exports to EU	in ECU mn	2835	5910	6497	10133	11828	13277	14.4
Total imports from EU	in ECU mn	3289	6952	8658	16030	20465	22291	21.4
Trade balance with the EU	in ECU mn	-454	-1043	-2161	-5897	-8637	-9014	.
Exports to the EU: Market shares	in %	0.84	1.58	1.68	2.06	2.06	2.14	.

Table A1 (continued)

		1989	1992	1993	1996	1997	1998	Average growth in % 1993-1998
ROMANIA								
Industrial production (at current prices)	in ROL bn	.	5484	15302	76198	171363	.	.
Industrial growth (at constant prices)	in %	.	-23.1	-1.2	2.1	-6.7	-13.8	-1.4
Employment	in 1000	.	2811	2590	2148	2032	1969	.
Employment growth	in %	.	-12.5	-7.9	-2.0	-5.4	-3.1	-5.8
Wage growth (ECU basis)	in %	.	-37.0	34.5	5.8	-6.5	30.3	13.5
Productivity growth	in %	.	-12.1	7.2	4.2	-1.4	-11.1	4.6
ULC growth (ECU basis)	in %	.	-28.3	25.5	1.5	-5.2	46.5	8.5
Total exports to EU	in ECU mn	1654	1333	1582	3275	4012	4554	22.7
Total imports from EU	in ECU mn	611	1545	1958	3747	4254	5168	22.3
Trade balance with the EU	in ECU mn	1043	-211	-376	-472	-242	-614	.
Exports to the EU: Market shares	in %	0.49	0.35	0.41	0.66	0.69	0.73	.
SLOVAK REPUBLIC								
Industrial production (at current prices)	in SKK mn	.	.	266525	390233	419028	545700	15.4 ¹⁾
Industrial growth (at constant prices)	in %	.	-15.7	-11.9	2.6	2.6	7.5	1.7
Employment	in 1000	.	527	472	447	439	515	.
Employment growth	in %	.	-12.6	-10.4	-1.1	-3.6	-4.4	-4.0
Wage growth (ECU basis)	in %	.	11.3	23.6	14.8	13.0	3.9	13.5
Productivity growth	in %	.	-3.6	-1.6	3.8	6.5	11.1	5.7
ULC growth (ECU basis)	in %	.	15.4	25.6	10.7	6.1	-6.5	7.3
Total exports to EU	in ECU mn	.	.	1069	2748	3221	4337	32.3 ¹⁾
Total imports from EU	in ECU mn	.	.	1084	3125	3729	4396	32.3 ¹⁾
Trade balance with the EU	in ECU mn	.	.	-15	-378	-508	-59	.
Exports to the EU: Market shares	in %	.	.	0.28	0.56	0.56	0.70	.
SLOVENIA								
Industrial production (at current prices)	in SIT mn	.	809602	998161	1597863	1868671	.	.
Industrial growth (at constant prices)	in %	.	-13.9	-4.1	-0.4	-2.6	4.5	0.9
Employment	in 1000	370	282	257	220	229	225	.
Employment growth	in %	.	-10.1	-9.0	-5.5	-3.2	-1.9	-4.9
Wage growth (ECU basis)	in %	.	-4.8	14.6	3.2	5.3	7.5	9.5
Productivity growth	in %	.	-4.2	5.4	5.4	0.7	6.5	5.2
ULC growth (ECU basis)	in %	.	-0.6	8.7	-2.0	4.6	2.1	3.3
Total exports to EU	in ECU mn	.	.	2808	3684	3960	4278	8.8 ¹⁾
Total imports from EU	in ECU mn	.	.	2852	4217	4886	5070	12.2 ¹⁾
Trade balance with the EU	in ECU mn	.	.	-44	-534	-926	-792	.
Exports to the EU: Market shares	in %	.	.	0.72	0.74	0.69	0.69	.

Notes: 1) 1994-1998.

EU: European Union (12)

Bulgaria: 1989-1995: Total manufacturing excluding petroleum refineries; Industrial production at 1993 prices.

From 1996: Industrial production at 1996 prices.

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.

Employment and wages: Enterprises with more than 20 employees.

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.

Slovak Republic: Enterprises with 25 and more employees, 1997 enterprises with 20 and more employees, 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 database

Table A2

Rubber and plastic products

Estimated ranges for Unit Labour Costs in 1998, Austria 1996 = 100

	Bulgaria	Czech Republic	Hungary	Poland	Romania	Slovak Republic	Slovenia
PPP for GDP (lower range)	16	28	15	19	14	19	54
PPP for fixed capital formation (upper range)	29	38	24	26	33	27	62

PPP=Purchasing power parities; gross wages used for calculation.

Source: WIIW

Table A3

Exports of individual industries in total manufacturing exports to the EU, 1998, 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	4.6	1.4	4.1	5.7	0.7	1.0	1.4
DB Textiles and textile products	29.2	8.1	9.2	16.8	41.8	9.7	12.4
DC Leather and leather products	6.6	1.3	2.7	1.5	12.7	3.5	2.0
DD Wood and wood products	2.4	3.0	1.4	5.7	2.6	2.1	3.7
DE Pulp, paper & paper products; publishing and printing	0.9	2.6	0.7	2.3	0.3	2.4	3.1
DF Coke, refined petroleum products & nuclear fuel ¹⁾
DG Chemicals, chemical products & man-made fibres	10.3	5.7	4.7	5.4	3.6	5.3	3.5
DH Rubber and plastic products	1.2	5.0	2.1	2.9	1.1	2.6	3.4
DI Other non-metallic mineral products	2.6	4.6	1.4	3.0	2.1	2.5	2.3
DJ Basic metals and fabricated metal products	29.2	17.7	7.9	17.6	16.0	14.7	17.0
DK Machinery and equipment n.e.c.	5.8	12.2	6.6	6.0	5.0	6.2	13.0
DL Electrical and optical equipment	3.4	15.5	30.1	12.6	4.4	11.0	10.8
DM Transport equipment	0.8	18.5	26.8	11.4	2.4	36.1	23.3
DN Manufacturing n.e.c.	2.9	4.4	2.4	9.0	7.3	2.8	4.1

Note: 1) Coke, refined petroleum products & nuclear fuels not termed manufacturing in the trade statistics.

Source: WIIW Database.

Table A4

Rubber and plastic products

Exports to the EU(12) in ECU mn, market shares in %

	EU(12) extra and intra EU imports		Bulgaria		Czech Republic ¹⁾		Hungary		Poland	
	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%
1996	41616.3		16.1	0.04	375.1	0.90	155.6	0.37	255.1	0.61
1997	45865.2		22.5	0.05	479.6	1.05	201.2	0.44	314.0	0.68
1998	48487.7 ³⁾		23.4	0.05	592.8	1.22	239.9	0.49	383.4	0.79
	Romania		Slovak Republic		Slovenia		CEEC(6) ²⁾		CEEC(7)	
	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%
1996	44.5	0.11	99.0	0.24	117.0	0.28	945.3	2.27	1062.3	2.55
1997	47.6	0.10	105.4	0.23	123.3	0.27	1170.2	2.55	1293.5	2.82
1998	49.6	0.10	114.1	0.24	146.5	0.30	1403.3	2.89	1549.8	3.20
	Austria		Denmark		Greece		Portugal		Spain	
	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%	ECU mn	%
1996	861.2	2.07	609.8	1.47	68.3	0.16	299.51	0.72	1811.6	4.35
1997	906.1	1.98	659.5	1.44	80.3	0.18	376.59	0.82	2118.7	4.62
1998	984.7	2.03	662.0	1.37	83.5	0.17	403.32	0.83	2439.9	5.03

Notes:

1) Until 1992 CSFR.

2) Including Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovak Republic.

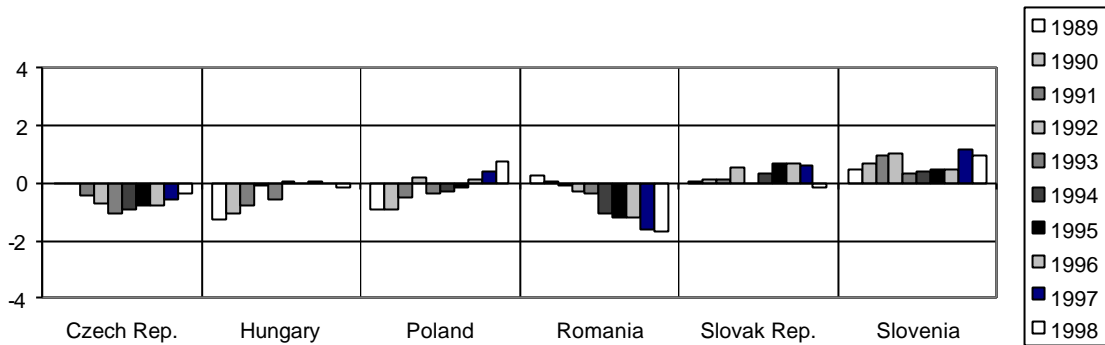
3) Preliminary.

Source: WIIW Database.

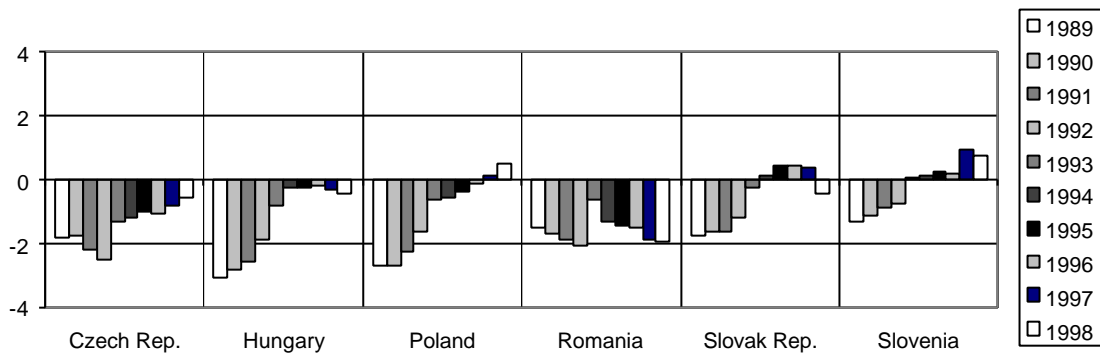
Figure A1

Rubber and plastic products
Shares of CEECs (at constant prices) relative to other countries

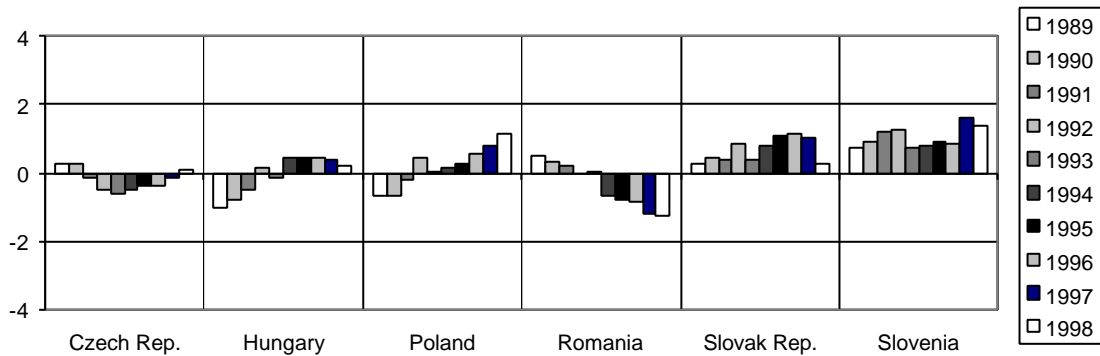
Shares in total production relative to Austria (1993,1996)



Shares in total production relative to EU-North (1992,1996)



Shares in total production relative to EU-South (1992,1996)



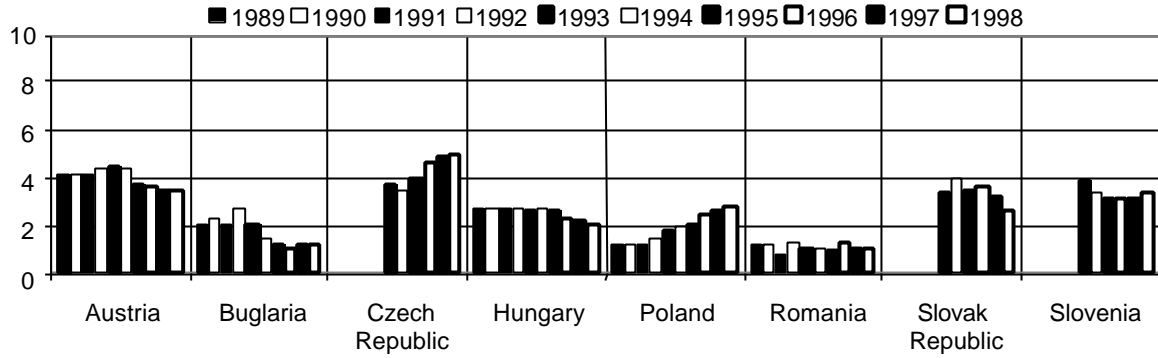
Notes : 1989-1992 production shares at constant prices: Czech Republic at 1993 prices, Hungary at 1992 prices, Poland at 1992 prices, Romania at 1993 prices, Slovak Republic at 1993 prices, and Slovenia at 1996 prices. 1993-1998 production shares at constant prices 1996 for all countries.

Source : WIIW Industrial Database.

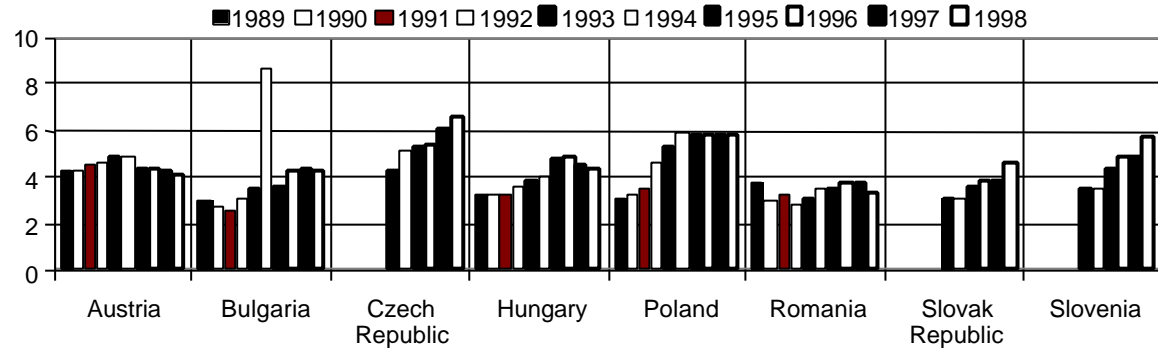
Figure A2

Rubber and plastic products

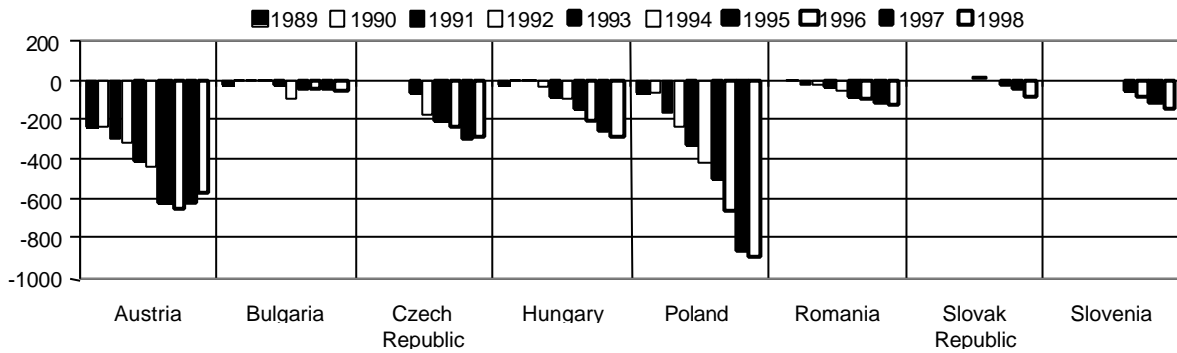
Share in manufacturing exports, in %



Share in manufacturing imports, in %



CEECs' trade balance with the EU, ECU mn



Source: WIIW Database.

WIIW Industrial Database Eastern Europe

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Topics covered:

Industrial production (current prices), national currency mn
Production structure (current prices), manufacturing = 100
Industrial production (constant prices), national currency mn
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 1989-98
DA	Food products; beverages and tobacco	Countries X 1989-98
DB	Textiles and textile products	Countries X 1989-98
DC	Leather and leather products	Countries X 1989-98
DD	Wood and wood products	Countries X 1989-98
DE	Pulp, paper & paper products, publishing & printing	Countries X 1989-98
DF	Coke, refined petroleum products & nuclear fuel	Countries X 1989-98
DG	Chemicals, chemical products and man-made fibres	Countries X 1989-98
DH	Rubber and plastic products	Countries X 1989-98
DI	Other non-metallic mineral products	Countries X 1989-98
DJ	Basic metals and fabricated metal products	Countries X 1989-98
DK	Machinery and equipment n.e.c	Countries X 1989-98
DL	Electrical and optical equipment	Countries X 1989-98
DM	Transport Equipment	Countries X 1989-98
DN	Manufacturing n.e.c.	Countries X 1989-98
By country		Dimension
	Czech Republic	NACE X 1989-1998
	Hungary	NACE X 1989-1998
	Poland	NACE X 1989-1998
	Romania	NACE X 1989-1998
	Slovak Republic	NACE X 1989-1998
	Slovenia	NACE X 1989-1998
	Bulgaria	NACE X 1989-1998
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

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Herausgeber, Verleger, Eigentümer und Hersteller:

Verein "Wiener Institut für Internationale Wirtschaftsvergleiche" (WIIW),
Wien 1, Oppolzergasse 6

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Internet Homepage: <http://www.wiiw.ac.at/>

Nachdruck nur auszugsweise und mit genauer Quellenangabe gestattet.

P.b.b. Verlagspostamt 1010 Wien