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The Vehicle Industry in the New Member States

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Contents

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Executive Summary

The motor vehicle industry[1)] in the new member states (NMS) is small by EU standards, but it is developing very dynamically and much faster than in the old member states (OMS) and than NMS manufacturing on average. This outstanding growth can be attributed to the high inflow of foreign direct investment, attracted by skilled and cheap labour making the industry internationally very competitive, by the investment promotion of local governments and the expectation of expanding domestic markets.

In 2003, the NMS produced around 1.3 million motor vehicles, which is close to 7 % of EU-25 production and 2.2 % of the motor vehicles produced worldwide. Production capacities for another 800,000 – 900,000 passenger cars are planned and partly under construction, so that by 2006 vehicle production in the NMS could exceed 2 million cars. Production is concentrated in 5 countries: the Czech Republic, Poland, Slovakia, Hungary and Slovenia (ranked by production size). 98 % of the vehicles produced are passenger cars; the production of component parts plays a more prominent role in the NMS than in the old member states (OMS).

Over the period 1997-2003, production (at constant prices) of the motor vehicle industry rose at 2-digit annual growth rates in most NMS. At the same time, employment increased very slowly, resulting in a strong rise of labour productivity. With labour productivity close to the average EU-level and wages far below the EU average, international (cost) competitiveness of the NMS in the production of vehicles and parts is very strong. Unit labour costs in the NMS are much lower than in the OMS.

The major drivers of this development are foreign investors providing capital, technology, know-how and their distribution networks. The bulk of foreign direct investment comes from European companies, with the German Volkswagen group taking a clear lead. But with EU enlargement, overseas investors have become more interested recently (e.g. Hyundai, Toyota). With the local markets still small, production sites in the NMS are mainly used as export platforms to the OMS. Following their customers, but also producing for the export market, all major vehicle parts producers, including Bosch, Delphi, Magna etc. have invested in the NMS, too. Altogether, a new 'Pôles Automobiles' seems to be emerging in Central and Eastern Europe, including the Czech Republic and Slovakia, western Hungary and the south of Poland as well as to some extent in the former Eastern Germany, not far from the traditional automotive centers of Germany and the vehicle cluster in Austria.

The vehicle market in the NMS is still small, but has great potential and is expected to grow faster than in the OMS. Taking the 'first-time registration of cars' as a measure for the market for new cars, the combined market for passenger cars in the NMS-8 totalled 862,000 units in 2003, taking only a small fraction, namely 6 % of the EU-25 passenger car market (14,700,000) in that year. The biggest single market is of course Poland, followed by Hungary and the Czech Republic. The car market in the other NMS is rather small. Over the period 1997 – 2003 the increase in car sales was not impressive and even declined in some years/countries. But while various factors such as business cycle fluctuations play a significant role for the demand for vehicles in the short term, the main determinant in the long term is per capita income. With GDP/capita in the NMS catching-up we may thus expect the passenger car markets in the NMS to expand faster than in the OMS in the medium term. Based on a cross-section analysis relating GDP/capita and the first-time registration of cars, and using wiiw projections for GDP/capita we have calculated various scenarios for the demand for passenger cars until the year 2015. According to the 'medium scenario', the number of passenger cars in the NMS-8 combined will reach about 1,331,400 units in 2010 and 1,627,3 in 2015, corresponding to an average annual growth rate of 7.5 % over the period 2005 – 2010 and 6.5 % during 2010 – 2015, much faster than what can be expected for the OMS. However, production capacities will significantly exceed vehicle demand in the NMS and the industry will remain highly export-oriented.

Foreign trade plays a very important role in the NMS automotive sector on the export as well as on the import side. In 2003, the by far largest exporters of road vehicles (including parts, SITC 78) were the Czech Republic, Slovakia and Poland, followed at some distance by Hungary and Slovenia. The most important vehicle import market is Poland. Over the period 1997 – 2003, both NMS exports and imports of road

1) The motor vehicle industry analysed in this study comprises the production of motor vehicles and parts (NACE 34).

vehicles rose very fast, at 2-digit annual rates, and faster than overall manufacturing exports in most NMS, pointing to a rising trade specialisation in this field. The combined world market shares of the NMS-8 in road vehicle exports went up from 1.4 % in 1996 to 3.5 % in 2002. NMS imports of road vehicles reflect the rising demand of final consumers but inputs for the expanding motor vehicle industry as well. The sectoral trade balance is highly positive in the Czech Republic and Slovakia, more or less balanced in Slovenia and mainly negative for the rest of the NMS. Around 80 % of NMS vehicle trade is with the European Union and with Germany in particular, but intra-regional trade is gaining importance, especially in some NMS (e.g. between the Czech Republic and Slovakia) and with regard to vehicle parts and bodies, underpinning the emergence of some kind of an automotive cluster in the region.

Prospects: Given that the world motor vehicle industry is highly globalised and at the same time very concentrated, the future of the NMS vehicle industry will largely depend on the strategic decisions of the global players in the industry. As the NMS vehicle industry will remain an export platform focussing mainly on the European market, the development of this market and the competitiveness of the NMS relative to other European low-cost producers (e.g. Spain, Romania, Ukraine) will be crucial for its further development. However, due to high productivity and low labour costs, the (cost) competitiveness of the NMS vehicle industry is very strong and leaves some scope for wage increases in the future. With international price competition getting fiercer, the high cost advantage in the NMS may also induce the relocation of production from 'old' production sites, for instance in Germany, but also in France and Italy. As regards the different sub-sectors of the industry, the car parts industry which is the most labour-intensive area and can therefore benefit the most from the low wage costs in the NMS and the production of commercial cars (trucks, buses) so far neglected by foreign investors, could offer special opportunities for the future.

1 The size of the motor vehicle industry in the New Member States

1.1 Methodology

This study deals with the situation and development of the motor vehicle industry in the new member states of the European Union in Central and Eastern Europe, i.e. the Czech Republic, Hungary, Poland, Slovakia and Slovenia (NMS-5), and where appropriate Estonia, Latvia and Lithuania (NMS-8). Vehicles include passenger cars and commercial vehicles such as trucks, buses etc. and the vehicle industry is defined according to NACE rev. 1 classification, namely: ‚motor vehicles, trailers and semi trailers' (34), comprising 'motor vehicles' (341), 'bodies for motor vehicles, trailers and semi trailers' (342) and 'parts and accessories for motor vehicles and their engines' (341). The period covered is 1997 – 200(2)3.

1.2 Size measured by the number of cars produced

The total number of vehicles produced in the Czech Republic, Hungary, Poland, Slovakia and Slovenia reached 1,289,415 units in 2003[2)] (there are to date no significant car assembly operations in the Baltic states). This represented 7 % of vehicles produced in the EU-25 (7.5 % of EU-15) and 2.2 % of total world output (see Table 1). The combined vehicle production of the NMS is thus comparable in size to Italy's output (1,321,631 units), the fifth largest vehicles producer in the old member states (OMS).

Of this, 1,264,814 are passenger cars (98 %) and only 24,601 are commercial vehicles (trucks, buses etc.). The proportion of passenger cars is significantly higher than in the OMS on average and also higher than in Finland and Germany, the two European countries with the highest proportion of passenger cars in total vehicle production. Among the NMS, Poland has the largest production of commercial vehicles in both absolute and relative terms (15,214 units, 5 % of all vehicles produced). Therefore, the NMS are seen to have a far higher share in the production of passenger cars (7.8 % of EU-25) than in commercial vehicles (1.1 %) where their production is negligible so far. Based on the total number of vehicles produced, the biggest vehicle producers among the NMS are the Czech Republic (441,719), Poland (322,061) and Slovakia (281,347), followed at some distance by Hungary (126,116) and Slovenia (118,172).

2) This figure includes 'double counting' between Volkswagen Slovakia and Volkswagen Germany, making up 94,353 units in this year, see Table1. But as the number of double countings fluctuates strongly from year to year and the assignment of production will always be subjective, the following analysis is based on the number of vehicles including double counting.

Table 1: Worldwide production of motor vehicles, 1997–2003 (units)

				Passenger cars			
Country	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
Austria	97,774	91,264	123,371	115,979	131,098	132,768	118,650
Belgium	1,004,970	951,196	917,513	912,233	1,058,656	936,903	791,703
Finland	33,694	31,100	33,903	38,468	41,916	41,068	19,225
France	2,258,769	2,558,231	2,784,469	2,879,810	3,181,549	3,292,797	3,220,329
Germany	4,678,022	5,348,115	5,309,524	5,131,918	5,301,189	5,123,238	5,145,403
Italy	1,573,947	1,402,382	1,410,459	1,422,284	1,271,780	1,125,769	1,026,454
Netherlands	197,225	242,989	262,242	215,085	189,261	182,368	163,080
Portugal	186,010	181,388	186,996	178,509	177,357	182,573	165,576
Spain	2,010,267	2,216,386	2,281,617	2,366,359	2,211,172	2,266,902	2,399,238
Sweden	375,705	368,305	213,895	259,959	251,035	237,975	280,394
United Kingdom	1,689,015	1,748,277	1,786,624	1,641,452	1,492,365	1,629,934	1,657,558
EU-15 incl. double count.	**14,105,398**	**15,139,633**	**15,310,613**	**15,162,056**	**15,307,378**	**15,152,295**	**14,987,610**
Double count. Germ./Belg.	–	–	449,786	328,936	328,936	297,576	253,879
Double count. Germ./Austr.	–	–	17,371	54,241	39,838	56,211	62,899
Double count. Port./ Spain	–	–	–	–	–	57,066	68,560
EU-15 excl. double count.	14,105,398	15,139,633	14,843,456	14,778,879	14,938,604	14,741,442	14,602,272
Czech Rep.	321,076	386,527	348,482	428,224	456,927	441,312	436,297
Hungary	76,300	89,733	125,889	134,029	140,401	138,239	122,338
Poland	353,140	460,000	546,843	481,689	335,996	287,534	306,847
Slovakia	40,885	125,089	126,503	181,333	181,644	225,442	281,160
Slovenia	95,717	127,199	118,132	122,949	116,082	126,661	118,172
NMS-5 incl. double count.	**887,118**	**1,188,548**	**1,265,849**	**1,348,224**	**1,231,050**	**1,219,188**	**1,264,814**
Double count. SK/Germ.	–	–	126,503	102,388	102,699	23,700	94,353
Double count. SK/CZ	–	–	–	–	–	–	–
NMS-5 excl. double count.	**887,118**	**1,188,548**	1,139,346	1,245,836	1,128,351	1,195,488	1,170,461
EU-25 incl. double count.	**14,992,516**	**16,328,181**	**16,576,462**	**16,510,280**	**16,538,428**	**16,371,483**	**16,252,424**
EU-25 excl. double count.	n.a.	n.a.	15,982,802	16,024,715	16,066,955	15,936,930	15,772,733
World incl. double count.	**46,703,813**	**45,777,000**	**48,473,356**	**49,588,577**	**47,653,599**	**49,547,121**	**50,490,968**
World excl. double count.	46,692,928	45,759,312	48,465,439	49,670,373	47,620,359	49,511,876	50,426,193
Shares (incl. double count.) in %							
NMS-5 in EU-15	6.3	7.9	8.3	8.9	8.0	8.0	8.4
NMS-5 in EU-25	5.9	7.3	7.6	8.2	7.4	7.4	7.8
NMS-5 in World	1.9	2.6	2.6	2.7	2.6	2.5	2.5

Table 1 continued

Table 1 (continued)

				Commercial vehicles			
Country	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
Austria	10,215	11,942	15,960	25,047	24,305	19,851	21,006
Belgium	96,334	113,958	99,548	121,061	128,601	120,286	112,680
Finland	373	452	472	458	404	393	433
France	321,098	316,633	395,724	468,551	446,869	409,073	399,727
Germany	344,906	378,673	378,168	394,697	390,488	346,071	361,226
Italy	253,645	290,355	290,797	316,031	307,916	301,312	295,177
Netherlands	20,428	27,471	44,978	52,234	49,682	48,923	55,801
Portugal	81,153	89,642	65,294	68,215	62,362	68,259	73,785
Spain	551,810	609,656	570,772	666,515	638,716	588,337	630,452
Sweden	104,034	114,456	36,847	41,384	38,112	38,218	42,638
United Kingdom	251,331	232,774	186,895	172,442	192,873	193,084	188,871
EU-15 incl. double count.	**2,035,327**	**2,186,012**	**2,085,455**	**2,326,635**	**2,280,328**	**2,133,807**	**2,181,796**
Double count. Germ./Belg.	–	–	–	–	–	–	–
Double count. Germ./Austr.	–	–	–	–	–	–	–
Double count Port./Spain	–	–	–	–	–	4,144	2,362
EU-15 excl. double count.	2,035,327	2,186,012	2,085,455	2,326,635	2,280,328	2,129,663	2,179,434
Czech Rep.	47,355	25,072	27,779	27,268	8,341	5,776	5,422
Hungary	3,492	3,197	2,297	3,369	3,912	3,274	3,778
Poland	31,640	38,300	27,991	23,283	11,879	23,598	15,214
Slovakia	967	767	328	450	359	276	187
Slovenia	159	–	–	–	–	–	–
NMS-5 incl. double count.	**83,613**	**67,336**	**58,395**	**54,370**	**24,491**	**32,924**	**24,601**
Double count. SK/Germ.	–	–	–	93	93	–	–
Double count. SK/CZ	–	–	–	72	72	–	–
NMS-5 excl. double count.	83,613	67,336	58,395	54,205	24,326	32,924	24,601
EU-25 incl. double count.	**2,118,940**	**2,253,348**	**2,143,850**	**2,381,005**	**2,304,819**	**2,166,731**	**2,206,397**
EU-25 excl. double count.			2,143,850	2,380,840	2,304,654	2,162,587	2,204,035
World incl. double count.	**8,002,515**	**7,150,699**	**7,546,430**	**8,334,583**	**7,977,273**	**8,587,241**	**9,174,434**
World excl. double count.	7,982,833	7,134,128	7,534,624	8,215,321	7,963,012	8,551,821	9,158,380
Shares (incl. double count.) in %							
NMS-5 in EU-15	4.1	3.1	2.8	2.3	1.1	1.5	1.1
NMS-5 in EU-25	3.9	3.0	2.7	2.3	1.1	1.5	1.1
NMS-5 in World	1.0	0.9	0.8	0.7	0.3	0.4	0.3

Table 1 continued

Table 1 (continued)

	Total of motor vehicles						
Country	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
Austria	107,989	103,206	139,331	141,026	155,403	152,619	139,656
Belgium	1,101,304	1,065,154	1,017,061	1,033,294	1,187,257	1,057,189	904,383
Finland	34,067	31,552	34,375	38,926	42,320	41,461	19,658
France	2,579,867	2,874,864	3,180,193	3,348,361	3,628,418	3,701,870	3,620,056
Germany	5,022,928	5,726,788	5,687,692	5,526,615	5,691,677	5,469,309	5,506,629
Italy	1,827,592	1,692,737	1,701,256	1,738,315	1,579,696	1,427,081	1,321,631
Netherlands	217,653	270,460	307,220	267,319	238,943	231,291	218,881
Portugal	267,163	271,030	252,290	246,724	239,719	250,832	239,361
Spain	2,562,077	2,826,042	2,852,389	3,032,874	2,849,888	2,855,239	3,029,690
Sweden	479,739	482,761	250,742	301,343	289,147	276,193	323,032
United Kingdom	1,940,346	1,981,051	1,973,519	1,813,894	1,685,238	1,823,018	1,846,429
EU-15 incl. double count.	**16,140,725**	**17,325,645**	**17,396,068**	**17,488,691**	**17,587,706**	**17,286,102**	**17,169,406**
Double count. Germ./Belg.	–	–	449,786	328,936	328,936	297,576	253,879
Double count. Germ./Austr.	–	–	17,371	54,241	39,838	56,211	62,899
Double count Port./Spain	–	–	–	–	–	61,210	70,922
EU-15 excl. double count.	16,140,725	17,325,645	16,928,911	17,105,514	17,218,932	16,871,105	16,781,706
Czech Rep.	368,431	411,599	376,261	455,492	465,268	447,088	441,719
Hungary	79,792	92,930	128,186	137,398	144,313	141,513	126,116
Poland	384,780	498,300	574,834	504,972	347,875	311,132	322,061
Slovakia	41,852	125,856	126,831	181,783	182,003	225,718	281,347
Slovenia	95,876	127,199	118,132	122,949	116,082	126,661	118,172
NMS-5 incl. double count.	**970,731**	**1,255,884**	**1,324,244**	**1,402,594**	**1,255,541**	**1,252,112**	**1,289,415**
Double count. SK/Germ.	–	–	126,503	102,481	102,792	23,700	94,353
Double count. SK/CZ	–	–	–	72	72	–	–
NMS-5 excl. double count.	970,731	1,255,884	1,197,741	1,300,041	1,152,677	1,228,412	1,195,062
EU-25 incl. double count.	**17,111,456**	**18,581,529**	**18,720,312**	**18,891,285**	**18,843,247**	**18,538,214**	**18,458,821**
EU-25 excl. double count			18,126,652	18,405,555	18,371,609	18,099,517	17,976,768
World incl. double count.	**54,706,328**	**52,927,699**	**56,019,786**	**57,923,160**	**55,630,872**	**58,134,362**	**59,665,402**
World excl. double count.	54,675,761	52,893,440	56,000,063	57,888,269	55,585,516	58,086,869	59,584,573
Shares (incl. double count.) in %							
NMS-5 in EU-15	6.0	7.2	7.6	8.0	7.1	7.2	7.5
NMS-5 in EU-25	5.7	6.8	7.1	7.4	6.7	6.8	7.0
NMS-5 in World	1.8	2.4	2.4	2.4	2.3	2.2	2.2

Note: Numbers include the production and the assembly of completely knocked-down vehicles.

Sources: EU-15, for NMS – Organisation Internationale des Constructeures Automobiles (OICA, International organisation of motor-vehicle manufacturers; http://www.oica.net); for World – Verband der Automobilindustrie (VDA, German Association of the Automotive Industry) International Autostatistics, 2003, 2004.

1.3 Size measured by output value of the motor vehicle industry

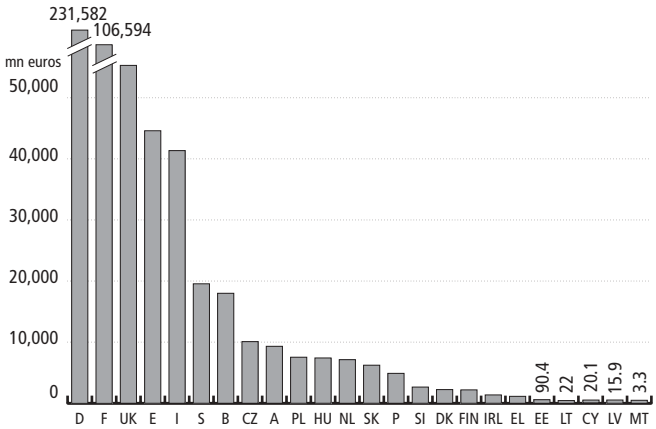
The motor vehicle industry according to NACE rev. 1 classification comprises the production of motor vehicles and parts (NACE 34). The combined production value of the motor vehicle industry in the NMS-8 totalled about EUR 33 bn in 2003 (converted at market exchange rates) and accounted for 5.9 % of total EU-25 output in the same year.

The NMS share of value added is slightly lower than that of production, reaching 4.8 % (see Table 2).

The biggest vehicle producers in terms of production values are the Czech Republic, Poland and Hungary, followed by Slovakia and Slovenia. (As mentioned above, according to the number of vehicles produced, Slovakia ranks third before Hungary because assembly plays a greater role in the former than in the latter, but the data also indicate that the unit value of vehicles produced in Hungary is higher than in Slovakia). In the European context, the size of the motor vehicle industry in the Czech Republic, Hungary, Poland and in the near future probably also in Slovakia, is similar to that of Austria or the Netherlands, ranking in the lower middle field of European vehicle producers, while the other NMS belong to the group of minor producers in the EU, such as Denmark, Finland, Greece and Ireland (see Figure 1).

Figure 1: Motor vehicle production in the old and in the new member states, 2002–2003

motor vehicle industry (NACE 34)



Source: Eurostat (2004); Panorama of Czech Industries 2003; VAD; Eurostat, SBS.

Table 2: Motor vehicles, trailers and semi-trailers (NACE 34), 2003

Overview of number of enterprises, production and employment

	Number of enterprises	*Production* [1] *mn EUR at exch. rates*	*% of manuf.*	*% of EU-25 at exch. rates*	*Value added* [3] *mn EUR at exch. rates*	*% of manuf.*	*% of EU-25 at exch. rates*	*Employment* [2] *ths. persons*	*% of manuf.*	*% of EU-25*
Czech Rep.	443.0	10,026.9	17.5	1.8	1,967.1	10.9	1.6	90.6	9.0	4.4
Estonia	20.0 [3]	74.0 [4]	2.2 [4]	0.0	27.9	2.5	0.0	1.6 [3]	1.2	0.1
Hungary	394.0	7,191.1	14.7	1.3	1,247.8	10.1	1.0	38.2	5.3	1.8
Latvia	21.0 [3]	12.0 [3]	0.3 [3]	0.0	5.8 [4]	0.4 [4]	0.0	0.7 [3]	0.5	0.0
Lithuania	27.0	8.9 [4]	0.1 [4]	0.0	4.8	0.3	0.0	0.4 [3]	0.2	0.0
Poland	1,092.0 [4]	8,565.0	7.6	1.6	2,044.5 [4]	4.5 [4]	1.7	84.6	3.9	4.1
Slovakia	72.0	5,395.1	20.4	1.0	432.3	10.8	0.4	22.9	6.0	1.1
Slovenia	93.0	1,329.9 [3]	9.7 [3]	0.2	154.2	3.4	0.1	7.0	3.1	0.3
NMS-8	**2,162.0**	**32,602.9**	**9.3** [3]	**5.9**	**5,884.4**	**6.7**	**4.8**	**246.1**	**4.9**	**11.8**
EU-15		539,949.0 [3]	11.0 [3]		116,402.8 [4]	8.1 [4]	1,923.0 [3]	7.4		
EU-25		548,511.0 [3]	10.5 [3]		121,811.5 [4]	7.9 [4]	2,078.4 [3]	7.1		

Notes: 1) At current prices. – 2) employees only. – 3) 2002. – 4) 2001.
Source: wiiw Industrial Database; Panorama of Czech Industries 2003, Eurostat, New Cronos, SBS.

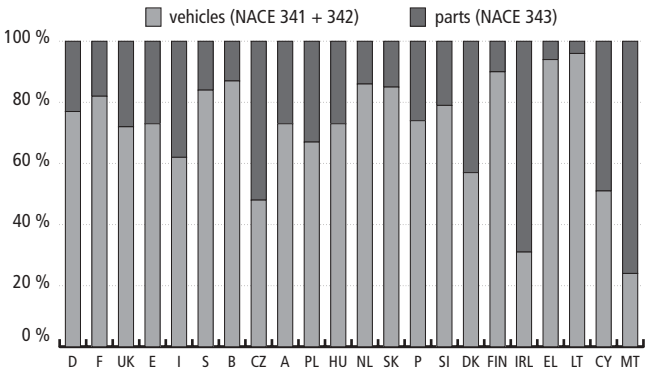
1.4 Subindustries: the production of parts for vehicles playing a relatively big role in the NMS

Among the three important sub-sectors of the motor vehicle industry representing different stages in the production chain, namely vehicles (NACE 341), bodies for motor vehicles (NACE 342) and parts and accessories (NACE 343), the production of vehicles plays the biggest role in the NMS, with a share of about 64 %, followed by parts and accessories with a share of 34 % and bodies for motor vehicles with a very small share of 2 % in production only (years 2002/2003)[3]. The respective distribution of production in the OMS was 73 %, 23 % and 4 %, pointing to a relatively stronger emphasis on the production of vehicle parts in the NMS than in the OMS. This is in line with the relatively more labour-intensive character of the vehicle parts industry than the assembly of cars and the production of bodies for vehicles in particular. The vehicle parts industry can therefore benefit more from the high-skilled low-cost labour in the NMS than the other two sub-branches.

Moreover, there are big differences in the distribution of sub-sectors across the individual NMS, with the production of parts playing a particularly small role in Lithuania (0.2 %) where vehicle bodies (parts thereof such as plastic spoilers) are dominant, and a particularly big role in the Czech Republic (50 %), partly as a consequence of the special provisions made in the Skoda-VW deal with regard to existing local supply-chains, but showing a certain specialisation of the Czech industry in this field as well. In contrast, vehicle parts still play a small role in Slovakia, which specialises in vehicle assembly with VW Bratislava being the dominant player in the industry (see Figure 2).

Figure 2: Production shares of motor vehicles and parts, 2002/2003

Production shares of motor vehicles and parts



Source: European Commission (2004); Panorama of Czech Industries 2003; VAD; Eurostat, SBS.

3) NMS-6; no data for individual sub-sectors were available for Latvia and Estonia.

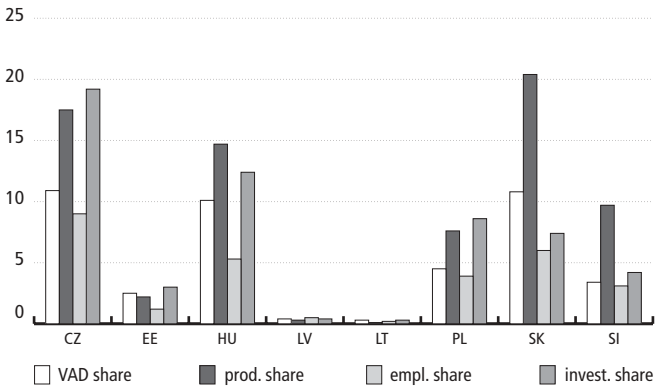
2 The importance of the vehicle industry in the domestic economy

Although small in an overall European context, the motor vehicle industry plays a very important role in the domestic economy of certain NMS and is a major driver of their economies. The countries most specialised in vehicle production are the Czech Republic, Slovakia and Hungary. In 2003, the share of the industry in total manufacturing output reached 17.5 % in the Czech Republic, 14.7 % in Hungary and 20.4 % in Slovakia (see Table 1 and Figure 3)[4]. In these countries, the share of the vehicle industry is in fact higher than in the big West European car producing countries such as France, Italy, the UK and Spain, ranging between 5 % and 14 %, probably with the exception of Germany (17 %). However, while in the Czech Republic and Slovakia the motor vehicle industry takes the top position among all manufacturing industries, indicating a clear specialisation in this field, it only ranks 3rd in Hungary, with the electrical equipment and food industry taking the lead there. It is interesting to note that in Slovenia, where the automotive industry is very small in absolute terms, it nevertheless has a relatively high share in manufacturing (9.7 %), while in Poland, which ranks second in car production after the Czech Republic, the role of the industry is relatively small (7.6 %) due to the large size of the overall economy.

The value added shares of the motor vehicle industry in the NMS are typically lower than the production shares, but the investment shares are generally higher, driven by foreign direct investment and pointing to the dynamic development of the industry. Employment shares are relatively low, due to the capital intensive character of the industry.

Figure 3: NMS motor vehicle industry: VAD, production, employment and investment, 2003

shares in total manufacturing, in %



Source: see Table 2 and Eurostat, New Cronos, SBS.

4) However, in Slovakia, the share of the motor vehicle industry may be overstated, as production data (at current prices) seem to be inflated (see 'The Slovak Data Puzzle' in the Appendix). In 2002, the share of the motor vehicle industry in total manufacturing came to 17.2 %, which looks more realistic.

3 Outstanding production growth

The automotive industry in the NMS is small measured by EU standards, but has been developing very dynamically and much faster than in the old member states and also faster than total manufacturing in the NMS. This outstanding growth can be attributed to the high inflow of foreign direct investment, attracted by skilled and cheap labour, making the industry internationally very competitive through the investment promotion incentives of local governments and the expectation of expanding domestic markets.

The total number of vehicles produced in the NMS has increased from 970,731 in 1997 to 1,289,415 in 2003, corresponding to an average annual growth rate of 4.8 %. But while the production of passenger cars developed dynamically, rising from 88,118 units in 1997 to 1,264,814 units in 2003 and consequently expanding at an annual average rate of about 6 %, much faster than in the OMS (1 %), the production of commercial vehicles declined from 83,613 units to 24,604 units over the same period (see Table 1). The production of trucks and especially buses had been relatively prominent in the socialist past, but existing domestic enterprises did not survive the transformational recession and foreign investors have shown little interest so far in investing in this particular field of the automotive industry in the NMS.

Output (production at constant prices) of the motor vehicles industry including the production of vehicle parts rose even faster than the number of vehicles produced at 2-digit annual growth rates in most NMS and significantly faster than overall manufacturing[5]. This is reflected in the positive growth differentials for all NMS in Table 3, except Latvia, where the vehicle industry is very small. In the Czech Republic, for instance, the vehicle industry expanded 14 percentage points faster per annum than average manufacturing, in Slovakia the growth differential was 12 ppts and in Hungary 11 ppts. However, the data showing a very fast growth of the vehicle industry in Lithuania have to be interpreted with care, as the level of production is still very low and fluctuating strongly, probably due to the varying classification of automobile parts either in the vehicle industry or in other industries – for instance in the electrical industry (wires, electronic components) or the plastic & rubber industry (bodies, parts thereof). But there is no doubt that the vehicle parts industry is developing very well in Lithuania[6]. In Poland, vehicle output rose fast until the year 2000, but was performing rather badly in 2001 and 2002, yet seems to have started recovering recently (see Figure 4). The slump was partly linked to specific problems such as the Joint Venture between Daewoo and the Polish government, which was adversely affected by the aftermath of the Asian economic crisis in 1997/1998, but was also a sign of a general weakness of the automotive industry in Poland – probably linked to domestic demand developing worse than expected and a relatively high wage level compared to other NMS competitors[7]. The growth of the Hungarian vehicle industry also slowed somewhat in 2001 and 2002, and probably one should bear in mind that 2001/2002 was a bad time for the European automobile industry in general due to a slack in overall demand which hit the car industry in particular.

5) Unfortunately, no data for production at constant prices were available at the level of sub-industries, i.e. vehicles (341), bodies (342) and parts (341).

6) Lithuania produces mainly bodies (NACE 342) and parts (NACE 343), but other of the country's industries also supply a wide range of components for the automobile industry, in particular electrical equipment and plastic parts (Ekonomines Konsultacijos ir Tyrimai UAB (2002).

7) The production of Fiat Auto declined from 340,630 cars in 1999 to 178,044 in 2002. Production of FSO Polonez (Daewoo) came down from 18,891 cars in 1999 to just 1,444 in 2002. The number of trucks produced fell from 7,625 to a mere 350 during the same period. (Ward Communications (2003), p. 98)

Table 3: Motor vehicles, trailers and semi-trailers (NACE 34), 1997–2003

Production growth (at constant prices 1999)

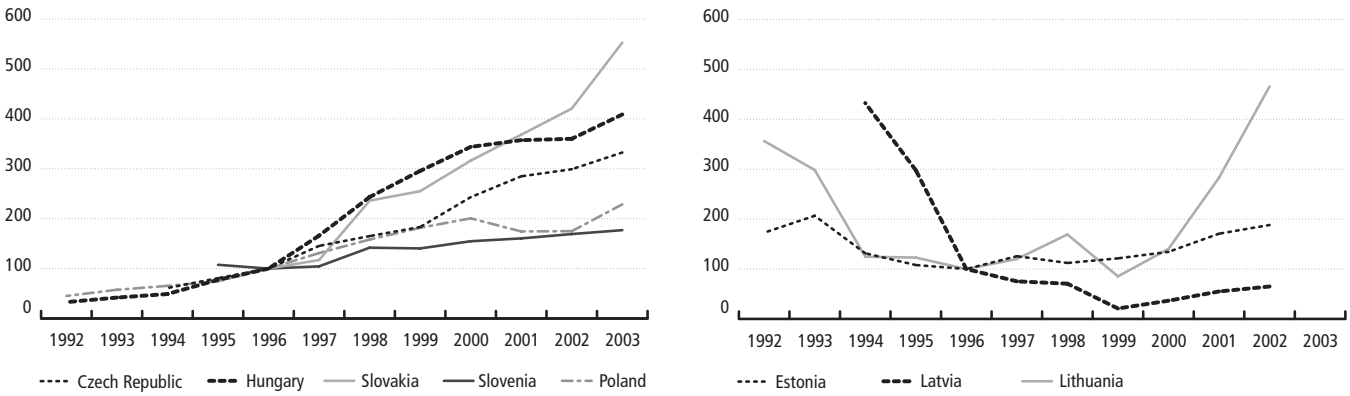
								Avg. annual changes in % Total manufacturing	Growth differential[1] in ppt
	1997	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*1997–03* [2]	*1997–03* [2]	*1997–03* [2]
Czech Republic	**45.5**	**13.5**	**11.0**	**32.6**	**17.2**	**5.0**	**11.2**	**18.7**	**4.3**	**14.4**
Estonia	**25.7**	**– 10.8**	**8.2**	**10.8**	**27.0**	**10.2**	**–**	**11.1** [3]	**8.6** [3]	**2.5** [3]
Hungary	**66.0**	**46.6**	**21.5**	**16.3**	**3.9**	**0.8**	**13.5**	**22.3**	**11.0**	**11.2**
Latvia	**– 24.7**	**– 6.3**	**– 70.4**	**74.6**	**50.7**	**18.2**	**–**	**– 6.9** [3]	**6.0** [3]	**– 13.0** [3]
Lithuania	**20.1**	**40.9**	**– 49.6**	**64.5**	**101.7**	**64.6**	**–**	**29.2** [3]	**6.1** [3]	**23.1** [3]
Poland	**31.1**	**20.7**	**14.8**	**10.5**	**– 13.1**	**0.3**	**30.7**	**12.5**	**5.9**	**6.6**
Slovakia	**17.2**	**101.5**	**8.0**	**24.0**	**16.4**	**14.2**	**31.4**	**27.1**	**5.8**	**21.3**
Slovenia	**4.5**	**35.8**	**– 1.1**	**10.3**	**3.7**	**5.4**	**4.6**	**8.5**	**2.1**	**6.4**

Notes: 1) Growth rate motor vehicles, trailers and semi-trailers – growth rate total manufacturing. – 2) Basis 1996. – 3) 1997–02.

Source: wiiw Industrial Database; Panorama of Czech Industries, Eurostat, New Cronos, SBS

Figure 4: Motor vehicles, trailers and semi-trailers (NACE 34)

Industrial production index (at constant prices 1999, national currency) 1996 = 100



Source: wiiw Industrial Database; Panorama of Czech Industries, Eurostat, New Cronos, SBS.

4 Employment levels kept low

The role of the automotive industry as an employer is generally less prominent than as a producer due to the capital-intensive character of the industry. However, in the case of some NMS the discrepancy is extreme, pointing to a very high labour productivity of the industry in these countries. In Hungary, for instance, the share of the vehicle industry in production is 14.7 % but in employment only 5.3 %, while in the OMS, in average terms, the vehicle industry has a production share of 11 % and an employment share of 7.4 % (!) – see Table 1. This phenomenon is the consequence of the dramatic production decline and labour shedding in the motor vehicle industry in the first years of transition[8)] and the emergence of a completely new industry, based on subsequent foreign direct investment. In most cases, the new owners either took over companies which had already reached a low employment level or set up new factories where they could make their employment decisions freely without bothering about existing staff and trade unions. At the same time they could choose from a large pool of a skilled labour force, particularly in the field of engineering. Nevertheless, the automotive industry is one of the very few manufacturing industries in the NMS where the number of employees has increased since 1995 (see Table 4 and Figure 5), although this development was limited to the three countries with very fast output growth (Czech Republic, Hungary, Slovakia). Furthermore, a closer look reveals that employment growth occurred just in two sub-sectors, namely 'manufacturing of bodies for motor vehicles' (NACE 342) and 'parts and accessories' (NACE 343), while in the 'production of vehicles' (NACE 341) itself, representing the largest part of the vehicle industry, typically no additional employment was created[9)].

Table 4: Motor vehicles, trailers and semi-trailers (NACE 34), 1996–2003

Employment (thousand persons)

	Motor vehicles, trailers and semi-trailers (NACE 34)								*Avg. annual changes in %*		
										Total manufacturing	*Growth differential[1)] in ppt*
	1996	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*1997–03[2)]*	*1997–03[2)]*	*1997–03[2)]*
Czech Republic	**57.5**	**62.3**	**67.9**	**69.1**	**78.7**	**84.9**	**88.9**	**90.6**	**6.7**	**– 2.3**	**9.0**
Estonia	**1.9**	**1.8**	**1.6**	**1.3**	**1.3**	**1.5**	**1.6**	**–**	**– 3.4[3)]**	**0.2[3)]**	**– 3.6[3)]**
Hungary	**24.7**	**29.2**	**33.2**	**32.1**	**33.2**	**36.1**	**36.1**	**38.2**	**6.4**	**0.3**	**6.1**
Latvia	**2.2**	**1.5**	**0.6**	**0.6**	**0.4**	**0.6**	**0.7**	**–**	**– 17.1[3)]**	**– 0.2[3)]**	**– 16.9[3)]**
Lithuania	**2.6**	**2.1**	**0.9**	**0.5**	**0.4**	**0.3**	**0.4**	**0.8**	**– 15.5**	**0.8**	**– 16.3**
Poland	**100.5**	**105.1**	**107.9**	**100.1**	**96.5**	**86.1**	**80.0**	**84.6**	**– 2.4**	**– 3.6**	**1.2**
Slovakia	**13.3**	**13.7**	**14.1**	**14.2**	**14.7**	**15.8**	**18.2**	**22.9**	**8.1**	**– 2.5**	**10.6**
Slovenia	**7.7**	**7.3**	**7.6**	**7.0**	**6.6**	**6.9**	**7.0**	**7.0**	**– 1.2**	**– 0.7**	**– 0.6**

Notes: 1) Growth rate motor vehicles, trailers and semi-trailers – growth rate total manufacturing. – 2) Basis 1996. – 3) 1997–02.

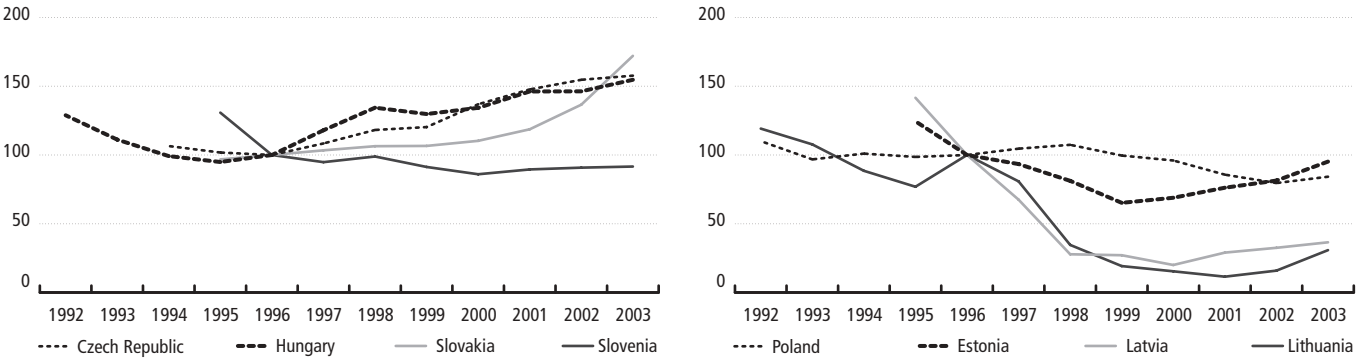
Source: wiiw Industrial Database; Panorama of Czech Industries, Eurostat, New Cronos, SBS.

8) Firstly, the car industry was underdeveloped in all demand economies as the emphasis was on mass transportation. Secondly, existing products were not internationally competitive and faced a severe blow after the opening-up of the economies. Altogether, the transport equipment industry and vehicle production in particular were among the big losers during the transformational recession, developing worse than manufacturing in all transition countries in average terms (see Hanzl (1999), p. 2 and Urban (1999), p. 23 f.).

9) The very high rates of decline in employment in the Baltic countries have to be seen in the light of the very small basis values for the vehicle industry in these countries (see Table 4).

Figure 5: Motor vehicles, trailers and semi-trailers (NACE 34)

Employment (1996 = 100)



Source: wiiw Industrial Database; Panorama of Czech Industries 2003, Eurostat, New Cronos, SBS.

5 High and strongly rising labour productivity

Labour productivity is defined as gross output per employee (OUT/EMP). The fast rise of output combined with an only moderate increase in employment is reflected in a very strong rise of labour productivity in the motor vehicle industry in most NMS[10]. The annual growth rates of productivity are given in Table 5. Among the big car producers, productivity growth was particularly strong in Slovakia and the least impressive in Slovenia – but in this country, the productivity level was already very high in 1996. Among the Baltic states, which are only minor auto producers, productivity growth was outstanding in Lithuania.

In all NMS analysed, productivity growth in the motor vehicle industry was significantly higher than in total manufacturing which is shown by the highly positive growth differentials given in Table 5, last column. Accordingly, in 2003, the productivity level in the automotive industry was much higher than in manufacturing on average. In Slovakia, the automotive industry reached 389 % of the productivity level in the manufacturing industry on average. For the other major vehicle producers in the NMS, this ratio came to 314 % in Hungary, 209 % in the Czech Republic and 185 % in Poland in the year 2002 (see Table 5). Slovenia, which is classified as a small vehicle producer, but with a relatively high specialisation in this industry, also shows a very high productivity relative to total manufacturing (327 %). In fact, the productivity lead of the automotive industry is far larger in the NMS than in the OMS, where the industry accounts for only about 150 % of manufacturing productivity on average – although France and in Spain, for instance, were showing a significantly higher margin of 195 % in 2000.

5.1 Labour productivity close to EU levels

An international comparison of productivity levels is generally hampered by the problem that production data in national currency have to be converted into a common currency, the result of which should reflect production in real terms in the countries compared. However, to compare (real) output levels in the automotive industry properly, information on relative prices in this specific industry is needed. Unfortunately, so-called (branch-specific) unit value ratios (UVRs), which compare prices of representative industrial products in different countries are only available for a few NMS and for selected years in the past[11]. But with car prices in EUR only slightly lower in the NMS than in the OMS, production values converted at market exchange rates may reflect production in real terms relatively accurately. As an alternative estimate, taking account of the automotive industry's similarities to the production of capital goods (machinery and equipment), we have also used purchasing power standards for gross fixed capital formation (PPS_{CAP}) for conversion purposes. The results are presented in Table 5b, second column. The latter estimates for productivity are higher because prices for capital goods in the NMS are lower than in the OMS, although not to the same extent as for instance food prices and services.

Labour productivity in the motor vehicle industry shows a fairly broad spread across the individual NMS with Slovenia at the top, reaching EUR 190,886 at current exchange rates and EUR 285,598 at PPS_{CAP} in 2003. It is followed fairly closely by Hungary and Slovakia. The Czech and the Polish vehicle industry ranges in the middle field, and the Baltic states which are minor vehicle producers, show very low levels of productivity (see Table 5b).

It is significant that, measured in PPS_{CAP}, the motor vehicle industry in Slovenia is already at the average EU-15 productivity level and Hungary and Slovakia are close behind, reaching 95 % and 90 %, respectively, in 2003. The Czech Republic and Poland come up to about 50 % of the EU-15 level, while the Baltic states move in the region of around only 20 % (see Table 5b, last column)[12].

10) Labour productivity = Output/Employment. For small changes we may thus assume: d Labour productivity = d Output – d Employment (compare, for instance, Hanzl/Havlik//Urban (2002), p.16).

11) UVR estimates for the year 1996 are available for the Czech Republic, Hungary and Poland relative to Germany from a joint research project by wiiw and the University of Groningen (Monnikhof and van Ark (2000).

12) However, labour productivity in Slovakia is most probably overstated due to production at current prices in 2003 being 'inflated' – see 'The Slovak Data Puzzle' in the Appendix.

Table 5: Motor vehicles, trailers and semi-trailers (NACE 34)

a) Labour productivity, national currency units (NCU), at constant prices 1999, 1997–2003 [1)]

	1996	1997	1998	1999	2000	2001	2002	2003
Czech Republic	**1,747,908**	**2,346,231**	**2,442,682**	**2,663,135**	**3,102,897**	**3,370,990**	**3,380,045**	**3,686,685**
Estonia	**284,087**	**382,478**	**392,162**	**528,391**	**554,000**	**636,165**	**656,325**	**–**
Hungary	**17,717,512**	**24,919,660**	**32,091,598**	**40,373,280**	**45,357,806**	**43,312,340**	**43,620,174**	**46,812,817**
Latvia	**5,274**	**5,882**	**13,383**	**4,060**	**9,599**	**10,003**	**10,548**	**–**
Lithuania	**6,271**	**9,324**	**30,655**	**27,810**	**57,184**	**153,788**	**–**	**–**
Poland	**150,414**	**188,563**	**221,689**	**274,331**	**314,444**	**306,258**	**330,599**	**408,598**
Slovakia	**2,223,925**	**2,519,807**	**4,935,772**	**5,321,498**	**6,378,885**	**6,897,493**	**6,845,413**	**–**
Slovenia	**18,651,432**	**20,570,193**	**26,775,298**	**28,679,315**	**33,578,032**	**33,442,998**	**34,788,513**	**36,042,175**

	NACE 34 In % of total manufacturing 2002	*Avg. annual change in % NACE 34 97–03*	*Total manufacturing 97–03*	*Growth differential* [1)2)] *in ppt 97–03*
Czech Republic	**208.8**	**11.3**	**6.8**	**4.4**
Estonia	**173.1**	**15.0** [3)]	**8.4** [3)]	**6.6** [3)]
Hungary	**313.9**	**15.2**	**10.7**	**4.5**
Latvia	**91.2**	**12.2** [3)]	**6.3** [3)]	**5.9** [3)]
Lithuania	**161.3** [4)]	**89.6** [5)]	**8.3** [5)]	**81.3** [5)]
Poland	**185.4**	**15.3**	**9.9**	**5.4**
Slovakia	**389.2**	**20.6**	**9.1**	**11.5**
Slovenia	**326.9**	**9.9**	**2.7**	**7.1**

Notes: 1) Production at constant prices 1999/number of employees; – 2) Growth rate of motor vehicles, trailers and semi-trailers minus the growth rate of total manufacturing; – 3) 1997–02. – 4) 2001. – 5) 1997–01.

b) Comparison of labour productivity, conversion at exchange rates and in PPS_{CAP}, 2002 [3)]

	Productivity EUR 2002	*in % of EU-15 2002*	*Productivity at PPS_{CAP} 2002*	*in % of EU-15 2002*
Czech Rep.	**104,539**	**37.2**	**148,728**	**52.9**
Estonia	**49,939**	**17.7**	**59,533**	**21.2**
Hungary	**181,686**	**64.6**	**267,917**	**95.2**
Latvia	**16,618**	**5.9**	**24,526**	**8.7**
Lithuania [1)]	**29,754**	**10.6**	**45,612**	**16.2**
Poland	**89,987**	**32.0**	**135,513**	**48.2**
Slovakia	**163,162**	**58.0**	**250,856**	**89.2**
Slovenia	**190,886**	**67.8**	**285,597**	**101.5**
EU-15 [2)]	**281,359**			

Notes: 1) 2001. – 2) Without Greece and Luxembourg. – 3) Purchasing power standards (PPS) for fixed capital formation (CAP).

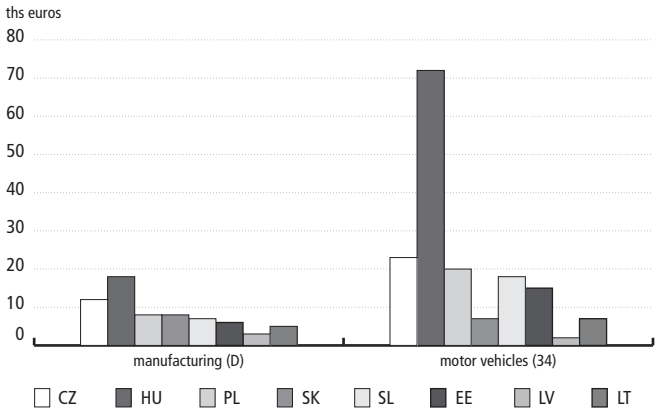
Source: wiiw Industrial Database; EU-15: Eurostat, New Cronos; SBS.

6 Foreign direct investment plays key role in the NMS vehicle industry

Foreign direct investment is the major source of capital, technology and know-how as well as a major driver of output, productivity and exports of the motor vehicle industry in the NMS.

Inward foreign direct investment plays a far bigger role for the automotive sector in the NMS than in the OMS[13]. Many globally active vehicle producers and suppliers, especially from Germany, have set up enterprises in the region and the development of the automotive industry in the individual countries is closely linked to the location decisions of these global players. The countries which have attracted most FDI in the motor vehicle industry are the same as those which show a strong specialisation in this industry, namely the Czech Republic, Hungary, Poland and more recently also Slovakia. Slovenia is the only country with a significant automotive industry, but relatively little inflow of foreign direct investment recently. It is interesting to note that the FDI stock per employee is above the average for the manufacturing sector in virtually all countries. The disproportionately high attractiveness of the motor vehicle industry for foreign direct investment is confirmed by our data from the wiiw FIE database, showing the distribution of foreign invested enterprises (FIEs) across individual industries (see Figure 6).

Figure 6: Inward FDI stock per employee, 2003



Source: wiiw FDI database

Table 6: Foreign penetration of the NMS automotive industry (NACE 34), 1996–2001[1]

in %

Equity	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*
Czech Republic [1]	**64.3**	**71.2**	**71.1**	**83.9**	**82.3**	**83.1**
Hungary [2]	**76.1**	**92.7**	**96.1**	**94.9**	**97.9**	**99.6**
Poland	**82.1**	**81.4**	**85.6**	**84.5**	**80.0**	**83.3**
Slovakia [3]	**48.5**	**54.0**	**47.1**	**72.6**	**73.0**	**78.6**
Slovenia	**120.2**	**136.9**	**133.0**	**69.7**	**75.8**	**76.7**

Notes: 1) of equity capital of FIEs in the automotive industry in the equity capital of all enterprises in the automotive industry. – 2) 1996–1999 nominal capital. – 3) 1996: DM (= NACE 34 + 35).

Source: wiiw FIE database.

13) Outward direct investment, on the other hand, does not play any role in these countries.

6.1 Foreign penetration

The dominant role of foreign investors in the automotive industry is best demonstrated by the extremely high penetration rate which can be measured by the share of foreign invested enterprises in various performance indicators of the industry.

In 2001, (the last year available)[14], foreign invested enterprises owned 83 % of the equity capital in the Czech automotive industry, made 94 % of all investments, sold 91 % of all vehicles and had a share of 94 % in the industry's exports. These shares were even higher in Hungary and the lowest in Slovenia (equity: 76.7 %, sales: 82.7 %, exports: 86.2 % (see Table 6 and Table A 2 in the Appendix). In all countries, foreign penetration has increased over time. In particular, foreign invested enterprises are more export oriented, as reflected in their higher share of export sales than of total sales. As will be shown in our trade analysis below, production sites in the NMS are used mainly as an export platform to the OMS.

6.2 Major foreign companies investing in the NMS

As already mentioned, the bulk of foreign direct investment in the NMS comes from manufacturers of European origin, with the German Volkswagen group[15] taking a clear lead. But with EU enlargement, overseas investors have become more interested in the region recently, attracted by growing markets but using the NMS as a location for their all-European exports as well. The Hyundai company (Republic of Korea), for instance, has decided to erect its first European assembly plant in Slovakia. It should also be mentioned that with the formation of cross-border automotive groups (e.g. DaimlerChrysler) and all kinds of co-operations between individual companies also across groups (e.g. Toyota/PSA Peugeot Citroen), the term 'country of origin' with regard to investment is becoming increasingly blurred in the automotive industry.

As shown in Table 7, apart from the Volkswagen Group (Germany), the following major vehicle producers have established assembly plants in the NMS, although of very different size: Renault (France), PSA Peugeot Citroen (France), Fiat (Italy), Volvo Trucks (Sweden), DaimlerChrysler (Germany/USA), General Motors (USA); Daewoo (Rep. Korea), Suzuki (Japan). The Hyundai company (Rep. Korea) and Toyota (Japan) in cooperation with PSA Peugeot Citroen (France) are planning to open new assembly plants by 2005/2006.

However, the number of vehicles produced by the different investors in the NMS differs widely and shows that European (German) producers are clearly in the lead so far. Table A 4 in the Appendix shows the number of vehicles produced by the different producers in the Czech Republic, Hungary, Poland, Slovakia and Slovenia for passenger cars and commercial vehicles separately.

14) The data were the result of a special project which was not extended beyond the year 2001, unfortunately.
15) The Volkswagen group comprises the following major divisions: VW, Audi, Skoda and Seat

Table 7: Assembly plants in Central and Eastern Europe, 2002

Manufacturer	*Country (country of parent company)*	*Plant site/Name*	*Products*
Andoria-Mot Sp. z.o.o.	Poland	Andrychow	Honker Suv, Lublin
Audi Hungaria Motor Kft.	Hungary (Germany, VW)	Györ	Audi TT Coupé/Roadster
Automobile Dacia S.A.	Romania (France, Renault)	Potesti	Dacia Berlina/Break, pick up, Supernova
Daewoo Automobile Romania, S.A.	Romania (Rep. Korea, Dawoo)	Rodae, Craiova	Daewoo Cielo, Matiz, Nubiera, Lanos, Takuma (CKD)
Daewoo Avia	Czech Republic (Rep. Korea, Daewoo)	Prague	Avia small trucks
Daewoo-FSO Motor	Poland (Rep. Korea, Daewoo)	Warsaw	Daewoo Matiz, Nubria, Lanos, Fiat Polonez
Fiat Auto	Poland (Italy, Fiat)	Tychny	Fiat Palio Weekend, Seicento, Uno/Van, Sierra
GM Poland	Poland (USA, GM)	Warsaw	Astra Classic
Magyar Suzuki	Hungary (Japan, Suzuki)	Esztergom	Suzuki: Wagon R+, Ignis
MAN	Poland (Germany/USA, DaimlerChrysler)	Poznan/Tarnovo Podgorne	Buses
NABI	Hungary	Kaposvar	Compobus vehs.
Opel Polska Sp.z.o.o.	Poland (USA, GM)	Gliwice	Opel Agila
PSA Peugeot Citroen	Poland (France, PSA)	Nysa	Citroen: Berlingo
Revoz	Slovenia (France, Renault)	Novo Mesto	Renault Clio
Skoda Auto a.s.	Czech Republic (Germany, VW)	Kvasiny Mlada Boleslav Vrchlabi	Superb Fabia, Octavia Octavia
Volkswagen Poznan Sp.z.o.o.	Poland (Germany, VW)	Poznan	Skoda, Fabia, VW: T5
Volkswagen/Skoda	Czech Republic (Germany, VW)	Vrchlabi	Skoda: Felicia, Octavia
Volkswagen Slovakia	Slovakia (Germany, VW)	Bratislava	VW: Bora, Polo A04, Golf R32, Golf A4, Touareg, Porsche Cayenne bodies, SEAT Ibiza
Volvo Trucks	Poland (Sweden, Volvo group)	Wroclaw	Trucks

Source: Ward's Automotive Yearbook 2003, p. 18 f.

Planned Investment

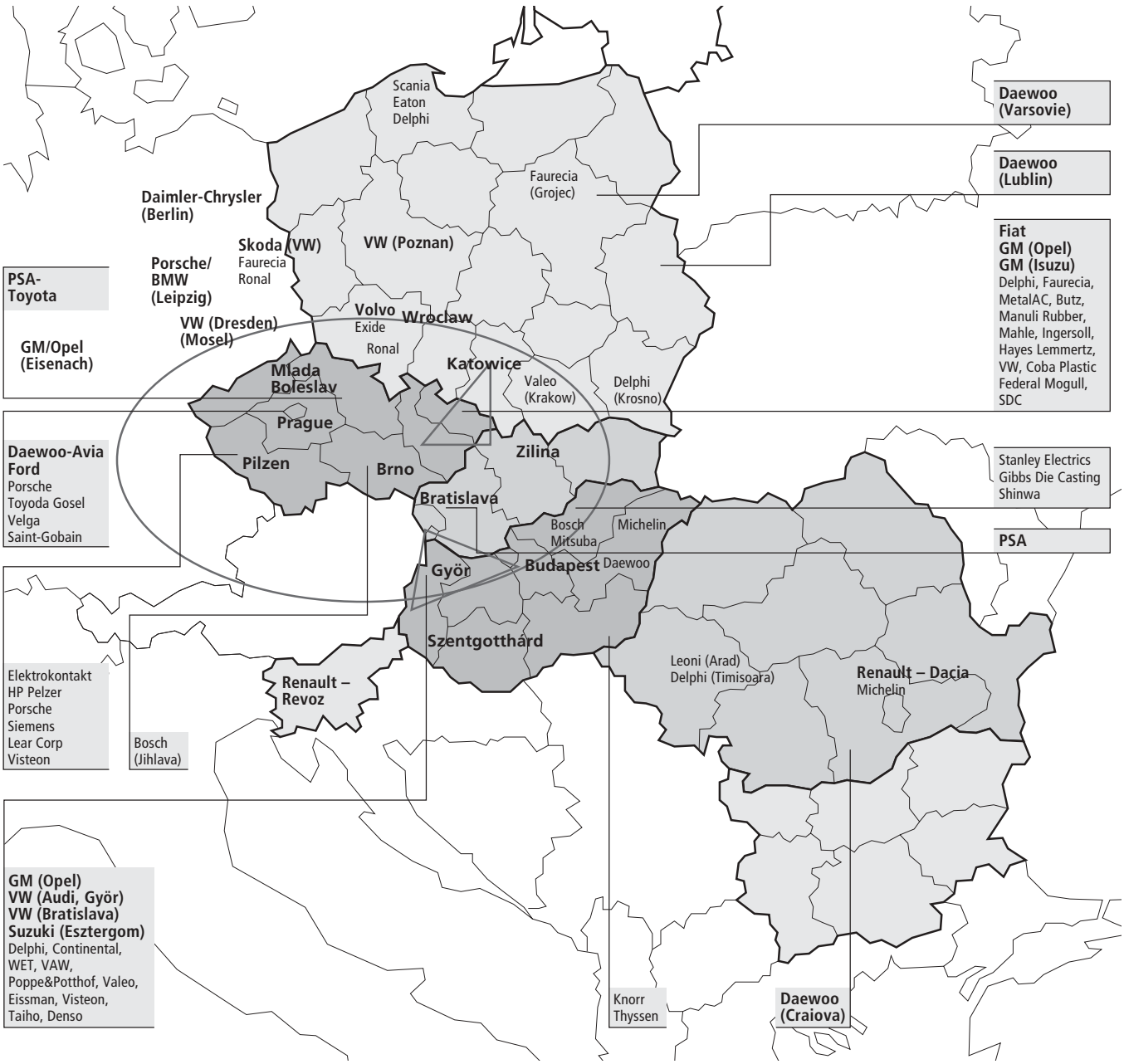
Manufacturer	*Country (country of parent company)*	*Plant site/Name*	*Products*
Hyundai	Slovakia (Rep. Korea, Hyundai)	Zilina	Investment: EUR 700 mn; production starting 2006; employment 3–4,000, annual output planned: 200,000–300,000
PSA Peugeot Citroen	Slovakia (France, PSA)	Trnava	Investment: EUR 700 mn, production starting 2006; output planned: 300,000
Toyota/PSA Peugeot Citroen	Czech Republic (Japan/France; Toyota, PSA)	Kolin	Investment: EUR 1.5 bn, starting 2005, output planned: 300,000

In the area of commercial vehicle production, which is only a small segment of the vehicle industry in the NMS and where foreign investors are less prominent, European (German) producers take the lead as well, with Daewoo from Korea being the only significant overseas investor so far (see Table A 4).

All major vehicle parts producers, including Bosch, Delphi, Magna etc. but many smaller ones as well have invested in the NMS, partly following their main customers but also to take advantage of the qualified and cheap labour force for export production.

Altogether, as it is put by the authors of a recent French study, a new 'Pôles Automobiles' seems to be emerging in Central and Eastern Europe, including the Czech Republic and Slovakia, western Hungary and the south of Poland (probably including Germany's new Länder, too), not far from the traditional automotive centers of Germany and the vehicle cluster in Austria (see Figure 7).

Figure 7: 'Pôles Automobiles': Major producers of motor vehicles and component parts



Source: DREE-Réseau Elargissement, jjboillot@dree.org & yann.lepape@dree.org; http://www.dree.org/elargissement; Lepape/Boillot (2004), p. 38.

7 The vehicle market in the NMS

The vehicle market in the NMS is small, but has great potential and can be expected to grow faster than in the OMS on average.

Income levels, the most important determinant of vehicle demand, are still low in all NMS. In 2003, GDP/capita (at purchasing power standards) varied from below 50 % (in the Baltic states and Poland) to 78 % (Slovenia) of the EU-25 average (see Table A 5 in the Appendix). But the NMS economies have been growing faster than the OMS over the last couple of years and the catching-up process is expected to continue in the future. Between 1997 and 2003, the Baltic countries had average annual growth rates of around 6 % and except for the Czech Republic, GDP rose faster than 3 % per annum in the other NMS. For 2004 and 2005, the Vienna Institute for International Economic Studies (wiiw) has forecast annual growth rates of between 4 %–5 % for most NMS and even higher rates for the Baltic states. In the longer term, until the year 2015, wiiw thus expects two of the NMS-8 (Slovenia and the Czech Republic) to approach EU-average income levels and the others to have reached around 60 % or more of the EU average (Table A 5).

Industrial production, an important determinant for transport services and thus commercial vehicles, is expected to grow even faster than GDP in most NMS.

7.1 Size of the passenger car market

The number of total vehicles in use in the NMS has increased sharply over the last years (see Table A 6 in the Appendix). As in other countries, passenger cars took the lion's share of all vehicles used. Accordingly, in absolute numbers, the highest increase of vehicles between 1997–2003 was in this category, rising from 16 million cars in 1997 to 20 million cars in 2003, at an average annual rate of 3.6 %, faster than in the OMS (2.4 %). Yet the motorisation rate (passenger cars per 1000 inhabitants) is still significantly below the EU-15 average (412 cars) in all NMS, except Slovenia (446 cars). It is also relatively high in the Czech Republic (358 cars) and particularly low in Slovakia (247 cars – see Table 8). But vehicles in use also include imports of second hand cars, which play an important role in some NMS, especially in Poland. The 'first-time registration of cars' is thus a better indicator for the size of the 'car market', i.e. sales of new cars.

Taking the 'first-time registration of cars' as a measure, the combined market for passenger cars in the NMS-8 totalled 862,000 units in 2003, accounting for only a small fraction, namely 6 % of the EU-25 passenger car market (14,700,000) in that year, while in terms of population the NMS represent a much higher share of 16 %. The biggest single market is of course Poland (358,000) followed by Hungary (208,000) and the Czech Republic (149,000). The car markets of the other NMS are very small (see Table 9). In particular, car sales (= first-time registration of cars) in the NMS were far below the production of passenger cars, reaching 1,170,115 units in 2003 (compare Table 1), pointing to the strong export orientation of the car industry in these countries. As can be seen in Figure 8, the number of first-time registrations did not show a smooth upward trend in the period 1997 to 2003, but fluctuated and even declined in some countries, especially in Poland, as 1997 was a kind of 'peak year' marking the end of the first wave of sales which swept the countries when the transformational recession had come to an end. Furthermore, overall economic growth slowed down in the region in 2001 and 2002.

7.2 Future trends

While various factors such as satisfaction of pent-up demand, business cycle fluctuations, legal and institutional changes, consumer confidence etc. play a significant role in the short term, the main determinant in the long term is the level of per capita incomes as demonstrated in Figure 9, showing a very close relationship between the first-time registration of cars/capita and GDP/capita (at PPSGDP) in the year 2003 (r2 = 0.82). Taking this relationship as a yardstick and with wiiw forecasts/projections for GDP/c until 2015 (see Table A 5), we can make a forecast for the demand for passenger cars in the NMS over the next ten years, which is presented in the lower part of Table 9. Based on the regression equation from Figure 9 and using the standard deviation of the predicted values we have calculated a 'low', 'medium' and 'high' scenario for the NMS car market in the years 2005, 2010 and 2015[16].

16) The calculations were done with the help of Robert Stehrer, wiiw

Table 8: Passenger cars in use and motorisation rate, 1997–2003

a) Passenger cars in use (in 1000)

	1997	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
Czech Rep.	3,382.4	3,484.0	3,431.5	3,431.6	3,523.3	3,648.9	3,652.2
Estonia	427.7	451.0	458.7	463.9	407.3	400.7	435.3
Hungary	2,297.1	2,218.0	2,255.5	2,364.7	2,482.8	2,629.5	2,785.8
Latvia	431.8	482.7	525.6	556.8	586.2	619.1	648.9
Lithuania	235.0	260.0	291.0	315.0	304.0	316.0	336.0
Poland	8,533.5	8,890.8	9,282.8	9,991.3	10,503.1	11,028.9	11,230.8
Slovakia	1,135.9	1,195.7	1,247.0	1,274.2	1,292.8	1,326.9	1,328.8
Slovenia	760.4	812.9	848.3	868.3	884.2	899.2	890.3
NMS-8	**17,203.9**	**17,795.0**	**18,340.4**	**19,265.7**	**19,983.7**	**20,869.1**	**21,308.0**
EU-15	166,505.0	170,859.0	175,720.0	180,346.0	184,426.0	187,409.0	–

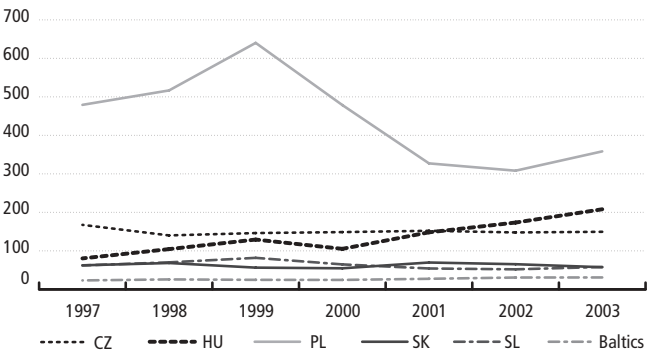
b) Motorisation rate (passenger cars per 1000 inhabitants)

Czech Rep.	344	358	359	335	345	358	358[1)]
Estonia	293	310	317	338	299	295	321
Hungary	224	216	221	232	244	259	275
Latvia	174	196	215	234	250	266	280
Lithuania	238	265	294	317	304	316	336
Poland	221	230	240	259	272	286	294
Slovakia	211	222	229	236	240	247	247
Slovenia	385	403	417	426	433	438	446
EU-15	371	380	390	399	407	412	–

Note: 1) 2002

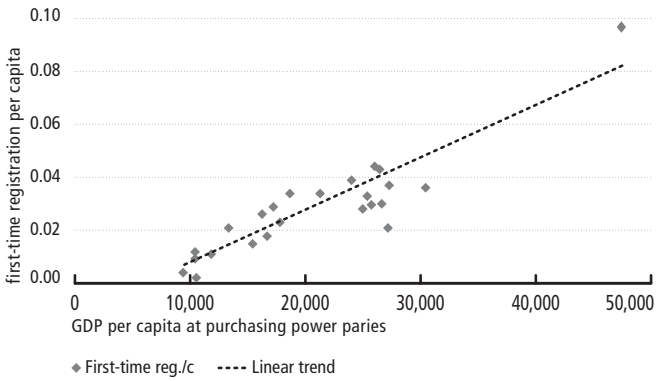
Source: Statistical yearbook on candidate countries, 2000, 2002, 2003; wiiw Handbook of Statistics 2003; Verband der Automobilindustrie (VAD), International Auto Statistics; Baltic countries: national statistical sources.

Figure 8: First-time registration of passenger cars, 1997–2003



Source: Verband der Automobilindustrie (VAD) (2004), p. 38 and Lepape/Boillot (2004), p. 8.

Figure 9: First-time registration of passenger cars per capita and income levels, EU-25, 2003



Source: Eurostat, Ameco database, wiiw database, Table 9.

Table 9: Passenger cars, number of first-time registrations during the year

a) 1997–2003, in 1000

	1997	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
Czech Rep.	167.52	140.11	146.20	148.70	152.10	147.80	149.55
Hungary	80.44	104.49	129.30	105.20	148.13	173.49	207.95
Poland	479.21	516.65	640.20	478.70	327.20	308.20	358.40
Slovakia	62.42	68.43	56.40	54.70	69.70	65.30	57.51
Slovenia	62.12	70.11	81.80	64.80	54.16	52.04	58.07
Baltics	23.17	25.84	24.73	24.50	27.40	30.72	30.88
NMS-8	**874.87**	**925.64**	**1,078.63**	**876.60**	**778.68**	**777.54**	**862.36**
EU-15	13,036.29	13,905.38	14,650.31	14,277.84	14,402.00	14,406.00	13,848.00
EU-25	–	–	–	–	–	–	14,745.16

Sources: Verband der Automobilindustrie (VAD) (2004) p. 38; Boillot and Lepape (2004), p. 8.

b) Forecast 2005–2015[1], different scenarios, in 1000

	low			*medium*			*high*		
	2005	*2010*	*2015*	*2005*	*2010*	*2015*	*2005*	*2010*	*2015*
Czech Rep.	**162.2**	**238.7**	**323.9**	**200.9**	**273.0**	**360.7**	**239.5**	**307.2**	**397.5**
Hungary	**123.9**	**194.4**	**274.5**	**165.9**	**230.3**	**308.5**	**208.0**	**266.1**	**342.5**
Poland	**171.0**	**383.8**	**635.9**	**365.5**	**551.6**	**778.2**	**560.0**	**719.5**	**920.5**
Slovakia	**42.2**	**75.6**	**114.6**	**67.3**	**96.9**	**133.0**	**92.3**	**118.2**	**151.4**
Slovenia	**41.2**	**57.3**	**75.0**	**48.1**	**64.1**	**83.6**	**55.0**	**70.9**	**92.1**
Baltics	**43.7**	**85.7**	**135.0**	**78.5**	**115.5**	**160.5**	**113.3**	**145.3**	**186.0**
NMS-8	**584.2**	**1,035.6**	**1,558.9**	**926.2**	**1,331.4**	**1,824.4**	**1,268.2**	**1,627.3**	**2,090.0**

Notes: 1) Based on the equation of the regression line in Figure 9 and GDP/capita estimates by wiiw for 2005 and projections for 2010 and 2015 assuming 4 % p.a. GDP growth and zero population growth p.a.

According to the medium scenario, the number of passenger cars in the NMS-8 combined will reach about 926.2 units in 2005, 1,331,400 units in 2010 and 1,824.4 in 2015, corresponding to an average annual growth rate of 7.5 % over the period 2005 – 2010 and 6.5 % during 2010 – 2015, much faster than what can be expected for the OMS.

7.3 Market for commercial vehicles expanding faster than that for passenger cars

Although the number of trucks increased by only 600,000 units between 1997 – 2002, the growth rate was faster than that of passenger cars, reaching 5 % per annum and reflecting the booming transport services industry in the NMS. The number of buses in use remained nearly constant as an indicator for the poor and deteriorating public transport systems in most NMS, handicapped by the curtailment of public expenditure (see Table A 6 in the Appendix). Despite the rapid increase of trucks in use, transport in the NMS is still much more dependent on railways than in the OMS, pointing to a large potential for further growth in road transport. This is particularly true for the economically less advanced countries, such as the Baltic states and Poland as well. Apart from lower income levels than in the OMS, the low motorway density is also a dampening factor for vehicle demand. Motorway density is particularly poor in Poland compared for instance to the Czech Republic and Hungary, but all countries (except Slovenia) compare poorly with the EU-15.[17] The improvement of the road infrastructure will thus be a great challenge for the future and an important determinant for the development of car use in the NMS.

17) Eurostat (2003), p. 152

8 Strong international competitiveness of the NMS vehicle industry

With labour productivity approaching EU levels and wages far below the EU-average, motor vehicle producers in the NMS have a substantial competitive edge with regard to labour costs, which can be measured by so-called 'unit-labour costs', i.e. the labour costs per unit of output.

Total labour costs consist of direct labour costs (wages) and indirect labour costs such as employer's contributions to social insurance or pension funds. However, the exact definition of indirect labour costs varies across countries, in particular before harmonisation with EU standards, and exact data obtained from labour force surveys (LFS) are often available for selected years only; the data for the years in-between have to be interpolated. Therefore, (gross) wages are considered more reliable for the analysis of labour costs over time. In Table 10, both, monthly gross wages and total labour costs, are presented insofar as these are available.

8.1 Wages rising fast, but still low

Despite (euro) wages in the automotive industry rising at average annual rates of 10 % or more over the period 1997–2003, the wage level in the NMS is still significantly below that of the OMS on average.

In 2003/2002, monthly gross wages in the NMS motor vehicle industry (converted into euros at market exchange rates), ranged between EUR 200 in Lithuania and EUR 950 in Slovenia. (Similar to the OMS, wage levels in the NMS automotive industry are typically higher than in manufacturing on average, due to the higher labour productivity in this industry). This corresponds to only 7 % (Lithuania) and 31 % (Slovenia) of the average wage level in the EU-15 automotive industry (see Table 10).

Indirect labour costs as a proportion of direct labour costs are typically higher in the NMS than in the OMS and thus compared to the EU-15 average, total labour costs are relatively higher than wages, but not much, reaching a maximum of 34 % for Slovenia (see Table 10, lower part).

8.2 Unit labour costs as a measure for international competitiveness

Unit labour costs (ULC's) are defined as 'labour costs per unit of output' (LC/OUT) or as 'wages divided by productivity'(W/LP),[18] showing the combined effect of wages and productivity. As wages in the NMS automotive industry are much lower than productivity when compared to EU-15 levels (see Tables 5 and 10), we may expect ULCs to stay significantly below EU levels for all NMS. However, the comparison of ULC levels across countries is hampered by the same problems as the international comparison of productivity levels, namely that production data in national currency have to be converted to a common currency. We therefore present two kinds of ULC, using alternative measures for the conversion of output, analogous to the calculation of productivity levels in Table 5, namely market exchange rates and purchasing power standards for fixed capital formation (PPS_{CAP}) – see Table 11.

As shown in Table 11, unit labour costs in the automotive industry are much lower in the NMS than in the OMS, indicating a very large competitive cost advantage of the NMS in this field. In 2002, ULC ranged from 27 % of the EU-15 level in Slovakia to 75 % in Estonia, which is only a minor motor vehicle producer. Converted at PPS_{CAP} the range is only from 17 % to 63 %. Apart from Slovakia, Hungary has a particularly significant cost advantage due to its high level of productivity combined with low wages (95 % of the EU-15 level; see Table 5)[19]. Slovenia, showing the highest productivity level of all NMS in the motor vehicle industry ranks third in terms of ULC only, because of the relatively higher wage level there. In the Czech Republic and Poland with the highest ULC level among the 5 big vehicle producers, ULCs amount to 50–60 % of the average EU-15 level measured at market exchange rates and about 40 % measured at PPS_{CAP}, which still gives these countries a significant competitive edge.

18) ULC = LC/OUT; .labour costs (LC) may be calculated as gross wages (W) multiplied by the number of employees (EMP). As labour productivity (LP) was defined as output per employee (LP = OUT/EMP), ULC can be rewritten as wages divided by productivity (W/LP): ULC = (W*EMP)/OUT = W/(OUT/EMP) = W/LP. For easier reading, LC are often expressed as a percentage of output, i.e. (LC/OUT) 100 = (W/LP) *100

19) However, as labour productivity in Slovakia is most probably overstated due to 'inflated' production values (at current prices), ULCs for Slovakia in Table 11 are underestimated to a certain extent (by 20 % to 30 %) and measured at PPSCAP ULC they may correspond more to the range of Hungary, reaching about 22 % of the EU-15 level.

Table 10: Motor vehicles, trailers and semi-trailers (NACE 34), 1996–2003

a) Monthly gross wages, EUR

	1996	1997	1998	1999	2000	2001	2002	2003	In % of total manufacturing 2002	In % of EU-15 2002	Av. annual growth rate 97–03
Czech Rep.	317	353	394	425	469	511	575	597	119.1	18.9	9.5
Estonia	228	271	316	338	370	375	405	–	114.1[1)]	13.3	10.1[2)]
Hungary	299	344	357	395	449	530	636	647	134.6	20.9	11.6
Latvia	135	163	191	157	155	249	–	–	94.6[1)]	8.6[1)]	13.0[3)]
Lithuania	80	128	139	148	189	192	–	–	75.2[1)]	6.6[1)]	19.0[3)]
Poland	286	325	352	449	515	585	575	534	116.0	18.9	9.3
Slovakia	227	267	311	324	407	454	478	–	139.9	15.7	13.2[2)]
Slovenia	621	664	727	794	849	877	932	941	107.5	30.6	6.1
EU-15	–	–	–	–	–	2,905	3,041	–	–	–	–

b) Monthly total labour costs, EUR

	1996	1997	1998	1999	2000	2001	2002	2003	In % of total manufacturing 2002	In % of EU-15 2002
Czech Rep.	452	502	559	596	664	729	820	851	119.7	21.0
Estonia	–	–	–	–	–	–	–	–	–	
Hungary	506	576	587	632	680	788	923	940	132.5	23.6
Latvia	–	–	–	–	–	–	–	–	–	–
Lithuania	–	–	–	–	–	–	–	–	–	–
Poland	415	471	510	650	616	700	688	639	116.0	17.6
Slovakia	316	326	404	329	393	878	650	–	134.6	16.6
Slovenia	892	948	1,037	1,133	1,211	1,251	1,329	1,344	113.0	34.0
EU-15	–	–	–	–	–	3,738	3,908	–	–	–

Notes: 1) 2001. – 2) 1997–2002. – 3) 1997–2001.

Source: wiiw Industrial Database; Panorama of Czech industries; Eurostat, European business, Facts and figures, 2003 edition, p. 224, own calculations.

Table 11: Motor vehicles, trailers and semi-trailers (NACE 34) Unit labour costs (ULC), international comparison, 2002

(conversion of output at market exchange rates and at PPS_{CAP})[1)]

	ULC EUR (at exch. rates) 2002	In % of EU-15 2002	ULC at PPS_{CAP} 2002	In % of EU-15 2002
Czech Rep.	6,602	50.9	4,640	35.8
Estonia	9,732	75.0	8,164	62.9
Hungary	4,199	32.4	2,848	22.0
Latvia	–	–	–	–
Lithuania	–	–	–	–
Poland	7,672	59.1	5,094	39.3
Slovakia	3,514	27.1	2,286	17.6
Slovenia	5,858	45.2	3,915	30.2
EU-15 [1)]	12,971	100.0	12,971	100.0

Notes: 1) wages converted in euro at market exchange rates; PPS_{CAP}: purchasing power standards for fixed capital formation. – 2) Without Greece and Luxembourg.

Source: Tables 5 and 10.

8.3 ULC development over time

The changes of ULCs over time can be considered at current or at constant prices for output. Changes in ULCs measured at current output prices (ULC_{curr}) are considered as an indicator for changing profitability, while ULC measured at constant output prices (ULC_{cons}) are taken as an indicator for changing international competitiveness.

Unit labour costs (ULC) at current and at constant prices

Defined as labour costs (W *EMP) per unit of output (OUT), production should be measured in real terms, the same as in the case of labour productivity (LP). For comparisons over time, therefore, production should be measured at constant prices, excluding changes in production value solely due to price movements. ULCs rise if wages rise faster than (real) productivity. This implies a deterioration of international competitiveness. (Assuming that the local producer is a price taker, a higher share of the production value has to be spent on labour costs). On the other hand, if productivity rises faster than wages, ULC will fall and international (cost) competitiveness will improve.

However, in the domestic economy or if the producer is a price maker on the international market, when wages increase faster than productivity (in real terms) this may lead to rising prices. And, on the other hand, when productivity increases faster than wages, this may induce price reductions. In both cases, the share of labour costs in production value (at current prices) may stay constant and therefore ULCs measured at current prices will stay at the same level as before. But ULC at current prices will rise if producers cannot fully feed rising labour costs to prices and will fall when excessive productivity gains are not passed on in the form of price reductions. Therefore, ULCs measured at current prices are often considered as an indicator of profitability. (In the event that output is measured as value added instead of gross output, ULC at current prices is simply the reverse of the profit-share). However, at the sectoral level, ULC changes may also reflect shifts in the structure of production from more to less labour-intensive products and/or production processes and vice versa.

See for instance: Hinze (1998), pp.56–73

ULCs measured at current prices declined in all NMS over the period 1997 – 2003, indicating rising profitability and/or increasing capital intensity of the industry. As a matter of fact, the proportion of labour costs in the production value (sales) has declined in all NMS, especially in the Baltic states and Slovakia, but to a lesser degree in the other countries – see Table A 7 in the Appendix[20].

ULCs measured at constant output prices have also declined in most NMS over the period 1997 – 2003, indicating an improvement of international (cost) competitiveness due to productivity gains outpacing wage increases (in national currency) on average. Only in Hungary and in Slovakia, ULC_{cons} showed a slight rise of about 1 % per annum (Table A 8). But those are the two countries with the lowest ULC level in 2003 (see Table 11). In particular, ULC_{cons} in the motor vehicle industry developed much more favourably than in the manufacturing sector on average in all NMS. In fact, for manufacturing as a whole ULCs have been rising in most NMS between 1997 and 2003 (especially in Slovenia and Hungary, see Table A8), indicating a deterioration of international (cost) competitiveness for the manufacturing industry on average in these countries.

However, with regard to international competitiveness, especially from the perspective of the international investor, the rise of wages measured in an international currency (EUR, USD) relative to productivity growth (at constant prices) would seem to be the most relevant consideration $ULC_{cons(eur)}$. This type of unit labour costs, also taking into account exchange rate movements, is shown in the last column of Table A 7. Over the period 1997 – 2003, $ULC_{cons(eur)}$ declined significantly in all NMS, including Hungary and Slovenia (due to currency depreciation). Only in the Czech Republic and Latvia, $ULC_{cons(eur)}$ declined less than ULC_{cons} as a consequence of currency appreciation.

Thus, the growing international (cost) competitiveness to be observed in the NMS motor vehicle industry, based on high productivity gains exceeding wage increases, has also been supported by favourable exchange rate policies in most NMS. Strong and rising international (cost) competitiveness of the NMS is reflected in a buoyant trade performance of the countries in this field.

20) As already mentioned in footnote 21, ULC (measured at current prices) are most probably underestimated due to inflated production values. In 2003, therefore, the strong decline shown in Table A 8 is overestimated.

9 Impressive trade performance

The analysis of motor vehicle trade in this section is based on the UN trade database, following the 'standard international trade classification', third revision (SITC rev.3). According to this classification, motor vehicles and parts are covered under 'road vehicles' (SITC 78), comprising 6 subgroups at the 3-digit level, such as cars (781), commercial vehicles (782), road motor vehicles, n.e.s. (783), parts and accessories (784), motorcycles (785), trailers and semi-trailers (786). The SITC rev. 3 classification from the UN trade database corresponds fairly closely to 'motor vehicles, trailers and semi-trailers' (NACE 34) used in this study so far. However, covering trade with all countries of the world, the most recent data available were for 2002. Therefore, we have supplemented the UN trade database with 2003 trade data from national sources, but this was possible at the 2-digit level only (SITC 78).

9.1 Strong export orientation of the NMS motor vehicle industry

Foreign trade plays a very important role in the NMS automotive sector on the export as well as on the import side. In 2003, the by far largest exporters of road vehicles were the Czech Republic, exporting road vehicles and parts (SITC 78) worth USD 7 bn, Slovakia (USD 6 bn) and Poland (USD 5 bn), followed at some distance by Hungary (USD 3.5 bn) and Slovenia (USD 1.3 bn); see Table 12. It is interesting to note that in 2002 Slovakia ranked only 4th as a vehicle exporter among the NMS, exporting cars worth USD 3 bn, which means that the country has doubled its vehicle exports in just one year – but its vehicle imports nearly doubled as well, due to the key role played by assembly work in the industry. However, analogous to production data (at current prices), export data for Slovakia seem to be inflated to a certain extent (probably 20 %–30 %), possibly due to transfer pricing between VW-Slovakia and VW-Germany. Deflating export data would bring export growth more in line with import growth, which consists mainly of inputs for production, and the trade surplus would be less impressive and in a similar range as last year (see also: 'The Slovak Data Puzzle' in the Appendix).

The most important import market for road vehicles and parts was Poland, absorbing vehicles worth USD 5.9 bn, followed by the Czech Republic (USD 4.5 bn), Hungary (USD 3.9 bn), Slovakia (USD 3.7 bn) and Slovenia (USD 1.2 bn).

The Baltic countries are rather small players in regard to both exports and imports due to their small size and a lack of specialisation in this field (see Table 12).

Table 12: NMS exports, imports and trade balance for road vehicles (SITC 78), 1997–2003

in USD million

a) Exports of road vehicles (SITC 78)

	1997	1998	1999	2000	2001	2002	2003	Av. annual growth rate
Czech Rep.	**2,815.3**	**3,859.7**	**4,043.1**	**4,541.9**	**5,321.1**	**6,093.0**	**7,423.0**	**20.3**
Estonia	**213.1**	**133.3**	**98.4**	**141.7**	**180.5**	**213.0**	**–**	**10.7**
Hungary	**1,089.3**	**1,411.6**	**2,250.9**	**2,459.6**	**2,712.7**	**2,979.3**	**3,504.6**	**30.0**
Latvia	**25.1**	**19.1**	**10.2**	**10.7**	**13.6**	**19.1**	**–**	**–7.5**
Lithuania	**263.2**	**249.3**	**102.3**	**154.4**	**318.6**	**439.5**	**–**	**13.5**
Poland	**1,492.9**	**2,009.2**	**2,263.0**	**3,069.8**	**3,222.8**	**3,581.5**	**5,002.9**	**20.9**
Slovakia.	**1,011.4**	**1,993.7**	**1,892.7**	**2,449.5**	**2,334.0**	**2,899.6**	**6,098.0**	**36.9**
Slovenia	**997.6**	**1,298.2**	**1,107.8**	**1,068.9**	**1,069.4**	**1,271.0**	**1,456.2**	**5.3**

b) Imports of road vehicles (SITC 78)

	1997	1998	1999	2000	2001	2002	2003	Av. annual growth rate
Czech Rep.	**2,131.4**	**2,126.5**	**2,224.1**	**2,365.7**	**2,921.4**	**4,171.6**	**4,467.4**	**12.4**
Estonia	**493.3**	**392.5**	**246.7**	**337.5**	**418.5**	**519.5**	**–**	**14.9**
Hungary	**1,144.9**	**1,791.8**	**2,408.3**	**2,362.0**	**2,459.8**	**3,039.2**	**3,908.1**	**21.7**
Latvia	**193.6**	**283.5**	**211.6**	**224.4**	**298.5**	**346.8**	**–**	**20.6**
Lithuania	**575.8**	**632.0**	**298.8**	**380.3**	**647.4**	**813.4**	**–**	**12.3**
Poland	**3,673.2**	**4,406.7**	**4,326.1**	**4,029.6**	**3,911.4**	**4,352.9**	**5,897.3**	**12.3**
Slovakia	**1,171.6**	**1,613.9**	**1,232.6**	**1,395.1**	**1,692.8**	**1,940.9**	**3,684.5**	**19.2**
Slovenia	**1,141.7**	**1,343.2**	**1,371.8**	**1,103.8**	**1,083.7**	**1,162.6**	**1,529.5**	**3.6**

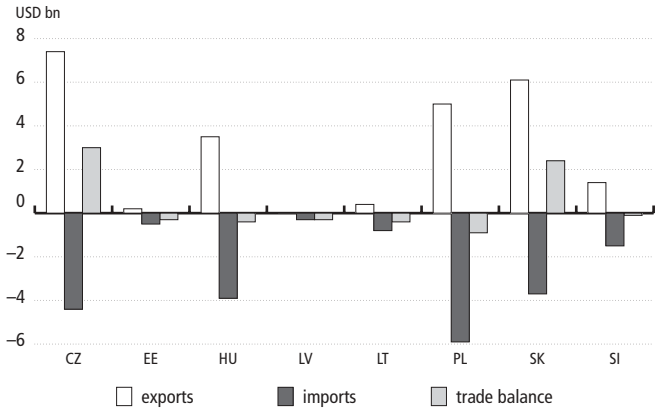
c) Trade balance of road vehicles (SITC 78)

	1997	1998	1999	2000	2001	2002	2003
Czech Rep.	**683.9**	**1,733.2**	**1,819.0**	**2,176.2**	**2,399.7**	**2,543.4**	**2,955.7**
Estonia	**–280.2**	**–259.2**	**–148.3**	**–195.8**	**–238.0**	**–306.5**	**–**
Hungary	**–55.6**	**–380.2**	**–157.4**	**97.6**	**252.9**	**–59.9**	**–403.5**
Latvia	**–168.5**	**–264.4**	**–201.4**	**–213.7**	**–284.9**	**–327.7**	**–**
Lithuania	**–312.6**	**–382.7**	**–196.5**	**–225.9**	**–328.8**	**–373.9**	**–**
Poland	**–2,180.3**	**–2,397.5**	**–2,063.1**	**–959.8**	**–688.6**	**–771.4**	**–894.4**
Slovakia	**–160.2**	**379.8**	**660.1**	**1,054.4**	**641.2**	**958.7**	**2,413.5**
Slovenia	**–144.1**	**–45.0**	**–264.0**	**–34.9**	**–14.3**	**108.4**	**–73.3**

Source: UN trade database; 2003: national statistical sources, wiiw calculations.

Typically, the sectoral trade balance is positive or nearly balanced for those NMS specialising in the automotive industry (the Czech Republic, Slovakia and Slovenia) and negative for the rest, including Poland, which is the second-largest motor vehicles producer in the region but has a relatively small share of the vehicle industry in total manufacturing (see Figure 10 and Table 12).

Figure 10: NMS trade in road vehicles (SITC 78), 2003[1)]



Note: 1) Estonia, Latvia and Lithuania 2002.

Source: UN trade database.

Moreover, in all NMS with a relatively big motor vehicle industry, the export orientation is extremely high, especially in foreign invested enterprises. According to the wiiw FIE database in 2001, export sales made up 81 % of total sales of FIEs in the Czech vehicle industry, 92 % in Hungary, 64 % in Poland and 82 % in Slovenia. The export shares of domestic enterprises were significantly lower, between 50 % and 60 % and only 14 % in Poland. Typically, export shares were rising over time (see Table A 3).

9.2 Rising share of vehicles in the manufacturing exports of the NMS

Over the period 1997 – 2003, both NMS exports and imports of road vehicles rose strongly, perhaps with the exception of Slovenia. In general, vehicle exports increased faster than imports.

The most dynamic exporters of road vehicles are Slovakia, the Czech Republic, Hungary and Poland, with average annual growth rates of vehicle exports ranging from 20 % to 37 % (Slovakia). Also, vehicle exports in these countries rose faster than overall manufacturing exports and thus the share of vehicles in total manufacturing exports increased significantly, pointing to a rising specialisation of these countries in this field. In the Czech Republic, for instance, road vehicle exports accounted for 10 % of total manufacturing exports in 1996, and reached 19 % in 2002. In the Slovak Republic the rise was from 10 % to 22 %, a trend which continued in 2003. In Hungary, the rise was somewhat less spectacular, but nevertheless, shares doubled from about 5 % to 10 %, similar to Poland. Among the Baltic states, only Lithuania recorded a strong increase of vehicle exports and a rising share in total manufacturing exports. In Slovenia, vehicle exports only increased moderately, in line with overall manufacturing exports. Accordingly, the already high share of vehicles in exports (12 %) did not increase further (see Tables 12 and A 9 in the Appendix).

Among the different sub-groups, passenger cars (SITC 781) are the backbone of NMS exports, followed at some distance by 'parts, bodies, tractors' (SITC 784); (Poland is an exception in this respect, as the export of parts is of similar importance as cars (see Table A 9 for details). In some NMS, exports of parts and bodies of cars rose faster than exports of cars (Czech Republic, Poland, Slovenia), but in other countries car exports outpaced exports of parts and bodies, e.g. Hungary and Slovakia.

Imports of road vehicles (including parts, SITC 78) reflect the rising demand of the final consumer but inputs for the expanding motor vehicle industry as well. Over the period 1997 – 2003, vehicle imports increased at an average annual rate of between 10 % and 20 % in most NMS, much faster than in the OMS on average. (Slovenia is once again an exception, with vehicle imports rising at only 3.6 % per annum.) Imports increased particularly strongly in 2003 due to the recovery of the overall economy leading to a deterioration of the sectoral trade balances in many NMS, e.g, in Hungary.

9.3 Increasing importance of the NMS in automotive trade worldwide and in the EU

As a consequence of the dynamic development in exports, the world market shares of those NMS specialising in motor vehicles have increased considerably, although from very low levels – and they are still small. The rise was most significant in the Czech Republic, increasing from 0.5 % in 1996 to 1.4 % in 2002, followed by Slovakia (0.16 % to 0.51 %), Hungary (0.13 % to 0.53 %) and Poland (0.31 % to 0.67 %) – the world market share of Slovenia even declined slightly (0.24 % to 0.22 %) – see Table A 9.

However, the bulk of NMS vehicle trade is with the European Union and with Germany in particular. In 2002, the share of the EU-15 in total road vehicle exports (SITC 78) was around 80 % in most countries (see Table 13). Only in

the Baltic states, where automotive exports are small anyway, is EU trade less dominant due to their traditional trade links with the former Soviet Union. Also, in the case of the Czech Republic, a significant share of automotive exports went to the neighbouring NMS, in particular to Slovakia, but to Poland and Hungary as well with the three countries reaching a combined share of more than 13 % in total exports and outpacing individual trading partners in the EU, except, of course, Germany (35 %). In general, the exports of the major product group which are passenger cars (SITC 781) for the most part went to the OMS, while vehicle parts and bodies (SITC 784) are being increasingly sold in the neighbouring NMS as well. This underpins the emergence of an automotive cluster in the region, comprising the Czech Republic and Slovakia, the south of Poland and western Hungary – forming a kind of 'oval'[21] as demonstrated in Figure 7 above. In some cases, where prominent foreign investors come from countries outside the European Union, such as GM (USA) and Suzuki (Japan) in Hungary, exports of vehicle parts to the home country of the foreign investors also play a certain role.

The European Union predominates as a source for vehicle imports of the NMS as well. However, except in the Baltics, the EU-15 sometimes played a lesser role in imports than in exports because of overseas suppliers penetrating the growing NMS automotive market – especially in the passenger car segment where the EU-15 share was typically around 75 %. However, their market share is still small[22]. Intra-regional exports of parts and accessories are also reflected in imports – this is particularly true for Slovakia where imports (of cars and parts) from the Czech Republic play an important role.

9.4 Revealed comparative advantage (RCA) in different sub-sectors of the vehicle industry

When calculating RCA indicators we basically look for product groups which perform better respectively less good in international trade than others, taking total manufacturing trade as a yardstick. RCA's as defined in Table A 10 compare the relative shares of exports and imports of a particular industry with the share of the country's total manufacturing exports and imports. A positive value indicates a comparative advantage of a particular industry (product group), while a negative value points to a comparative disadvantage in this field. Our results show a large comparative advantage for road vehicles in general (SITC 78) for the Czech Republic and Slovakia, but only a small comparative advantage for Hungary and Slovenia, and a comparative disadvantage for Poland and the Baltic states. At the level of sub-groups, the revealed comparative advantage was typically largest for passenger cars (SITC 781), followed by parts & bodies for motor vehicles (SITC 784). As regards the other sub-groups (SITC 782 and 783), only Poland showed a slight comparative advantage in trucks etc. (SITC 782), see table A 10.

Table 13: EU-15-shares in vehicle trade of the NMS, 2002

SITC, in %

	Exports [1]					*Imports* [2]				
	78	*781*	*782*	*783*	*784*	*78*	*781*	*782*	*783*	*784*
Czech Rep.	**74.1**	**71.5**	**25.3**	**68.2**	**80.6**	**85.1**	**81.0**	**91.6**	**86.0**	**87.5**
Estonia	**34.8**	**20.0**	**39.8**	**14.2**	**54.2**	**70.6**	**62.3**	**83.1**	**89.4**	**83.0**
Hungary	**84.4**	**97.2**	**53.2**	**10.6**	**73.8**	**77.1**	**74.0**	**75.8**	**72.3**	**81.8**
Latvia	**41.1**	**39.0**	**10.7**	**54.8**	**52.7**	**73.4**	**74.0**	**81.2**	**63.3**	**73.4**
Lithuania	**5.3**	**3.5**	**7.1**	**17.3**	**29.2**	**80.5**	**77.5**	**94.5**	**96.9**	**68.7**
Poland	**86.5**	**90.3**	**91.3**	**61.0**	**83.9**	**82.8**	**79.8**	**97.3**	**95.2**	**77.9**
Slovakia	**80.2**	**81.4**	**10.3**	**52.0**	**79.6**	**72.9**	**50.0**	**81.5**	**74.5**	**83.0**
Slovenia	**86.6**	**87.9**	**71.1**	**34.0**	**87.9**	**88.2**	**84.1**	**97.6**	**85.7**	**89.9**

Notes: 1) Exports to the EU-15 divided by total exports of the respective product group. – 2) Imports from EU-15 divided by total imports of the respective product group.

Source: UN trade database, wiiw calculations.

21) Compare Lepape/Boillot (2004)

22) A notable exception is Estonia, where vehicle imports from Japan amounted to 14 % and those from Russia had a share of 6 % in 2002 (UN trade database).

10 Prospects

The motor vehicle industry is highly globalised and at the same time very concentrated, particularly in the car industry, where just 14 major producer groups share the world market. Thus, the future of the NMS motor vehicle industry will largely depend on the strategic decisions of these global players. According to present business plans, production capacities in the NMS will increase by 800,000 to 900,000 passenger cars in the years to come and production may reach 2 million cars by 2006. More (overseas) foreign investors may follow, taking advantage of the emerging 'car cluster' in the region.

Vehicle demand in the NMS is also expected to increase significantly, along with rising per capita income, but will remain below supply for the foreseeable future, probably reaching 1.8 million cars in 2015. Therefore, the NMS vehicle industry will remain an export platform focussing mainly on the European market. The development of the European market and competitiveness relative to other European low-cost producers (e.g. Spain, Romania, Ukraine) will thus be crucial for the further development of the industry. However, due to high productivity and low labour costs the international (cost) competitiveness of the NMS vehicle industry is very strong and leaves some scope for wage increases in the future. But different wage developments in the individual NMS may well influence location decisions of foreign investors across the region. With worldwide overcapacities in the car industry and international price competition getting fiercer, the high cost advantage in the NMS may well induce production relocations from 'old' production sites, for instance in Germany, France and perhaps Italy. However, high-quality skilled labour, an additional attraction of the NMS, is already becoming increasingly scarce in some countries (e.g. in Hungary).

With regard to the different sub-sectors of the industry, the car parts industry which is more labour-intensive than either car assembly or the production of bodies for vehicles, can benefit most from low wage costs in the NMS. The production of commercial vehicles (trucks, buses) so far neglected by foreign investors and currently at a very low level also seems to offer interesting opportunities for the future, with the market for commercial vehicles in the NMS expanding faster than that of passenger cars due to the booming transport services industry challenging its competitors in the OMS. Further potential is provided by the fact that transport in the NMS is still relying on railways much more than the OMS, pointing to a large potential for further growth in road transport if the road infra- structure improves.

Appendix

The Slovak Data Puzzle

When analysing the motor vehicle industry in Slovakia, we came across a number of 'data puzzles,' which make it somewhat difficult to present a clear picture of the recent development of the industry.

- Allocation of production at VW Bratislava or VW Germany
- Inflated production values
- Inflated export values (transfer pricing?)

These problems most probably lead to an over-estimation of production (at current prices), labour productivity, vehicle exports and the sectoral trade surplus on the one hand and an under-estimation of unit labour costs on the other. There is also no clear answer to the rate of growth of vehicle production (in real terms) in 2003. The problems may be related to transfer pricing between VW-Bratislava, the dominant vehicle producer in Slovakia, and the parent company in Germany.

	2001	*2002*	*2003*
No. of vehicles produced in Slovakia incl. double counting	**182,003**	**225,718**	**281,347**
Growth rate, in %	**–**	**24.0**	**24.6**
No. of vehicles produced in Slovakia excl. double counting	**79,211**	**202,018**	**186,994**
Growth rate, in %	**–**	**155.0**	**–7.4**
Double counting SK/Germany	**102,792**	**23,700**	**94,353**
Production at current prices (NACE 34), mn SKK	**100,438**	**126,483**	**223,848**
Production at constant prices 1999 (NACE 34),	**108,822**	**124,278**	**163,345**
Growth rate, in %	**–**	**14.2**	**31.4**
Implicit price index of production (34), 1999 = 100	**92.3**	**101.8**	**137.0**
Change of implicit price index (inflation rate)	**–**	**10.3**	**34.6**
Exports, mn USD	**2,334.0**	**2,899.6**	**6,098.0**
Growth rate, in %	**–**	**24.2**	**110.3**
Imports, mn USD	**1,692.8**	**1,940.9**	**3,684.5**
Growth rate, in %	**–**	**14.6**	**89.8**

Table A 1: Manufacture of motor vehicles, trailers and semi-trailers (NACE 34)

Production (at current prices), mn EUR

	1996	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*
Czech Rep.	**2,656.2**	**3,806.2**	**4,494.4**	**4,992.0**	**6,829.6**	**8,351.3**	**9,291.4**	**10,026.9**
Estonia	**33.8**	**43.6**	**37.8**	**42.8**	**54.0**	**74.0**	**–**	**–**
Hungary	**1,658.7**	**2,793.5**	**4,127.3**	**5,118.7**	**6,070.1**	**6,390.5**	**6,564.9**	**7,191.1**
Latvia	**13.0**	**12.2**	**12.1**	**3.2**	**7.1**	**10.7**	**12.0**	**–**
Lithuania	**8.2**	**9.1**	**5.6**	**3.3**	**3.0**	**8.9**	**–**	**–**
Poland	**3,853.3**	**4,975.3**	**5,963.4**	**6,496.6**	**7,714.8**	**7,197.5**	**7,199.0**	**8,565.0**
Slovakia	**641.9**	**764.3**	**1,603.4**	**1,708.5**	**2,217.9**	**2,319.1**	**2,962.2**	**5,395.1**
Slovenia	**835.2**	**888.6**	**1,178.0**	**1,038.3**	**1,176.8**	**1,199.5**	**1,329.9**	**–**

Source: wiiw Industrial Database; Panorama of Czech Industries 2003; Eurostat, New Cronos, SBS.

Table A 2: Foreign penetration of the NMS automotive industry (NACE 34) in sales, export sales and investment*, 1996–2001

in %

Sales	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*
Czech Republic	**66.9**	**76.5**	**81.5**	**90.4**	**87.7**	**91.0**
Hungary	**84.8**	**95.4**	**96.8**	**96.0**	**93.9**	**93.9**
Poland	**82.5**	**86.8**	**89.9**	**90.7**	**91.4**	**93.2**
Slovakia[1)]	**61.4**[2)]	**–**	**92.1**	**–**	**93.3**	**95.1**
Slovenia	**82.3**	**81.8**	**83.1**	**82.0**	**78.8**	**82.7**
Export sales						
Czech Republic	**–**	**82.3**	**88.0**	**94.8**	**90.9**	**94.0**
Hungary	**90.4**	**98.5**	**99.1**	**98.7**	**96.7**	**96.6**
Poland	**93.3**	**94.2**	**95.7**	**96.1**	**97.4**	**98.4**
Slovakia	**–**	**–**	**–**	**–**	**–**	**–**
Slovenia	**86.3**	**86.5**	**87.1**	**84.0**	**80.1**	**86.2**
Investment						
Czech Republic	**80.2**	**83.2**	**85.4**	**93.8**	**91.8**	**94.0**
Hungary	**96.1**	**84.9**	**98.4**	**98.5**	**96.4**	**97.5**
Poland	**88.1**	**79.2**	**80.0**	**96.0**	**94.8**	**95.3**
Slovakia	**33.8**	**92.6**	**86.9**	**94.4**	**92.6**	**97.8**
Slovenia	**–**	**–**	**–**	**–**	**–**	**–**

*Share of sales (export sales, investment) of FIEs in the automotive industry in the sales (export sales, investment) of all enterprises in the automotive industry.

Notes: 1) 1996: DM (= NACE 34+35). – 2) Output.

Source: wiiw FIE database.

Table A 3: Motor vehicles, trailers and semi-trailers (NACE 34)

Export sales/Sales, in %

	1997		*1998*		*1999*		*2000*		*2001*	
	DE	*FIE*	*DE*	*FIE*	*DE*	*FIE*	*DE*	*FIE*	*DE*	*FIE*
Czech Republic	**47.1**	**67.3**	**46.2**	**76.3**	**40.7**	**79.7**	**50.0**	**69.7**	**52.4**	**81.1**
Hungary	**28.4**	**87.4**	**24.5**	**89.8**	**29.7**	**93.0**	**49.2**	**94.8**	**50.5**	**92.5**
Poland	**10.6**	**26.3**	**11.6**	**29.1**	**13.7**	**34.5**	**14.9**	**52.0**	**14.3**	**63.6**
Slovakia	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Slovenia	**55.2**	**78.5**	**58.8**	**80.2**	**64.5**	**74.5**	**73.8**	**79.9**	**62.4**	**82.1**

Note: DE: domestic enterprises; FIE: foreign invested enterprises.

Source: wiiw FIE database.

Table A 4: NMS motor vehicle production by country and company, 2002

	Number of vehicles
Czech Republic	
Skoda/Volkswagen Group	441,308
Others	4
Total cars	**441,312**
Daewoo AVIA	967
Jlaureta	4
Karosa	1,548
KH Motor CENTRUM	45
Magma	30
Praga	31
Skoda/Volkswagen Group	1,161
SOR Libchavy	218
Tatra	1,761
Total commercial vehicles	**5,765**
sub total	**447,077**
Hungary	
Audi	54,048
Suzuki	84,633
Total cars	**138,681**
Csepel	587
Ikarus/NABI/RABA	1,067
Others	50
Total commercial vehicles	**1,704**
sub total	**140,385**

	Number of vehicles
Poland	
Daewoo	28,880
Fiat	178,044
FSO Polonez	1,144
Opel	85,728
Total cars	**293,796**
Daewoo/FS Lublin	2,500
FSO Polonez Truck	350
Jelcz	250
MAN/Star SA	1,063
Total commercial vehicles	**4,163**
sub total	**297,959**
Slovakia	
VW Bratislava	225,442
Total cars	**225,442**
Kobit (SEZ KBT)	30
SAO-BUS	1
SLOV-AVIA	79
SLOVBUS	16
TATRA Sipox	8
VSS Kosice	132
Others	10
Total commercial vehicles	**276**
sub total	**225,718**
Slovenia	
Revoz (Renault)	126,661
sub total	**126,661**
Grand Total	**1,237,800**

Source: Ward's Automotive Yearbook 2003, p. 98.

Table A 5: GDP per capita at current PPS (EUR) in the NMS, 1990–2015

a) from 2004 at constant PPP

	1990	1995	1999	2000	2001	2002	2003	2004	2005	2006	2010	2015
									Projection assuming 4 % p.a. GDP growth and zero population growth p.a.			
Czech Rep.	**10,317**	**11,135**	**13,626**	**13,530**	**14,101**	**14,922**	**15,410**	**15,950**	**16,508**	**17,168**	**20,084**	**24,436**
Hungary	**7,797**	**7,844**	**10,200**	**11,032**	**12,019**	**12,841**	**13,674**	**14,221**	**14,833**	**15,426**	**18,047**	**21,956**
Poland	**4,934**	**6,556**	**8,916**	**9,464**	**9,672**	**10,029**	**10,376**	**10,894**	**11,385**	**11,840**	**13,851**	**16,852**
Slovakia	**6,554**	**7,114**	**9,161**	**9,914**	**10,479**	**11,328**	**11,731**	**12,259**	**12,872**	**13,387**	**15,661**	**19,054**
Slovenia	**9,793**	**10,937**	**14,331**	**15,151**	**15,916**	**16,719**	**17,501**	**18,096**	**18,729**	**19,478**	**22,787**	**27,724**
Estonia	**–**	**5,793**	**8,038**	**9,011**	**9,609**	**10,451**	**10,857**	**11,454**	**12,107**	**12,591**	**14,730**	**17,922**
Latvia	**7,810**	**4,636**	**6,987**	**7,692**	**8,367**	**9,183**	**9,967**	**10,615**	**11,305**	**11,757**	**13,754**	**16,734**
Lithuania	**8,059**	**5,454**	**7,441**	**8,106**	**8,851**	**9,575**	**10,604**	**11,664**	**12,656**	**13,162**	**15,398**	**18,733**
Cyprus	**10,527**	**13,296**	**15,902**	**17,278**	**18,294**	**18,390**	**18,839**	**19,593**	**20,377**	**21,192**	**24,791**	**30,162**
Malta	**–**	**11,134**	**14,052**	**15,062**	**15,124**	**15,479**	**15,605**	**16,229**	**16,879**	**17,554**	**20,535**	**24,985**

b) European Union (25) average = 100

	1995	1999	2000	2001	2002	2003	2004	2005	2006	2010	2015
Czech Rep.	**70**	**70**	**65**	**66**	**68**	**69**	**70**	**71**	**72**	**77**	**85**
Hungary	**49**	**52**	**53**	**56**	**58**	**61**	**62**	**64**	**65**	**70**	**76**
Poland	**41**	**46**	**46**	**45**	**45**	**46**	**48**	**49**	**50**	**53**	**58**
Slovakia	**44**	**47**	**48**	**49**	**51**	**53**	**54**	**55**	**56**	**60**	**66**
Slovenia	**68**	**74**	**73**	**75**	**76**	**78**	**79**	**80**	**82**	**88**	**96**
Estonia	**36**	**41**	**44**	**45**	**47**	**49**	**50**	**52**	**53**	**57**	**62**
Latvia	**29**	**36**	**37**	**39**	**42**	**45**	**47**	**49**	**49**	**53**	**58**
Lithuania	**34**	**38**	**39**	**41**	**43**	**47**	**51**	**54**	**55**	**59**	**65**
Cyprus	**83**	**82**	**84**	**86**	**83**	**84**	**86**	**87**	**89**	**96**	**105**
Malta	**70**	**72**	**73**	**71**	**70**	**70**	**71**	**72**	**74**	**79**	**87**

Source: National statistics, Eurostat, wiiw estimates.

Table A 6: Motor vehicles in use in the NMS (as of 31 Dec.), 1997–2003

in 1000

Czech Rep.	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*Av. annual changes in %*
Passenger cars	3,382.4	3,484.0	3,431.5	3,431.6	3,523.3	3,648.9	3,652.2	1.3
Trucks	355.1	365.9	367.8	369.0	388.4	413.5	–	3.1
Buses	20.7	19.9	19.0	18.3	18.4	21.3	–	0.6
total	**3,758.3**	**3,869.8**	**3,818.2**	**3,818.9**	**3,930.0**	**4,083.8**	**–**	**1.7**
Hungary								
Passenger cars	2,297.1	2,218.0	2,255.5	2,364.7	2,482.8	2,629.5	2,785.8	3.3
Trucks	342.3	336.9	364.1	366.4	380.1	396.1	–	3.0
Buses	18.6	18.5	17.7	17.9	17.9	17.9	–	–0.8
total	**2,658.0**	**2,573.4**	**2,637.4**	**2,749.0**	**2,880.8**	**3,043.5**	**–**	**2.7**
Poland								
Passenger cars	8,533.5	8,890.8	9,282.8	9,991.3	10,503.1	11,028.9	11,230.8	4.7
Trucks	1,513.0	1,658.0	1,767.9	1,880.4	1,979.1	2,031.8	–	6.1
Buses	81.8	80.8	78.7	82.4	82.0	83.1	–	0.3
total	**10,128.3**	**10,629.6**	**11,129.4**	**11,954.0**	**12,564.2**	**13,143.8**	**–**	**5.4**
Slovakia								
Passenger cars	1,135.9	1,195.7	1,247.0	1,274.2	1,292.8	1,326.9	1,328.8	2.6
Trucks	149.1	144.2	149.1	153.2	161.5	171.3	–	2.8
Buses	11.2	12.3	11.1	10.9	10.6	10.6	–	–1.2
total	**1,296.2**	**1,352.1**	**1,407.1**	**1,438.3**	**1,465.0**	**1,508.8**	**–**	**3.1**
Slovenia								
Passenger cars	760.4	812.9	848.3	868.3	884.2	899.2	890.3	2.7
Trucks	38.5	55.0	56.8	60.1	62.5	65.3	–	11.1
Buses	2.4	2.3	2.3	2.3	2.2	2.2	–	–1.5
total	**801.3**	**870.2**	**907.4**	**930.6**	**948.8**	**966.7**	**–**	**3.8**
NMS-5								
Passenger cars	16,109.4	16,601.3	17,065.1	17,930.1	18,686.2	19,533.3	19,887.9	3.6
Trucks	2,398.0	2,560.0	2,705.7	2,829.1	2,971.5	3,078.1	–	5.1
Buses	134.8	133.9	128.8	131.6	131.1	135.1	–	0.1
total	**18,642.1**	**19,295.2**	**19,899.6**	**20,890.8**	**21,788.8**	**22,746.5**	**–**	**4.1**

Table A 7a: Motor vehicles, trailers and semi-trailers (NACE 34), 1997–2003*

Unit labour cost, national currency, at **current** prices (ULC_{curr})

	1996	1997	1998	1999	2000	2001	2002	2003	In % of total manuf. 2002
Czech Rep.	8.23	6.92	7.15	7.06	6.49	6.23	6.60	6.47	60.7
Estonia	15.74	13.52	15.84	12.00	11.01	9.02	–	–	–
Hungary	5.35	4.31	3.45	2.97	2.94	3.59	4.20	4.13	46.7
Latvia	28.55	24.64	12.24	28.96	10.46	18.63	–	–	–
Lithuania	30.59	35.65	26.96	27.13	30.46	7.68	–	–	–
Poland	8.959	8.24	7.64	8.30	7.73	8.40	7.67	6.33	66.1
Slovakia	5.64	5.77	3.29	3.22	3.22	3.71	3.51	–	38.9
Slovenia	–	6.53	5.62	6.43	5.71	6.03	5.86	–	33.6
EU-15	–	–	–	–	–	–	13.00	–	100.0

	Annual change in %							Av. annual change in %		Growth differential [1] in ppt
	1997	1998	1999	2000	2001	2002	2003	97–03	total manuf. 97–03	97–03
Czech Rep.	–15.9	3.2	–1.2	–8.1	–4.0	5.9	–2.0	–3.4	–4.6	1.2
Estonia	–14.1	17.2	–24.3	–8.3	–18.0	–	–	–10.5 [2]	–1.7 [2]	–8.8 [2]
Hungary	–19.4	–20.1	–14.0	–0.8	22.2	16.8	–1.7	–3.6	–1.9	–1.7
Latvia	–13.7	–50.3	136.6	–63.9	78.1	–	–	–8.2 [2]	–0.4 [2]	–7.8 [2]
Lithuania	16.5	–24.4	0.6	12.3	–74.8	–	–	–24.1 [2]	–1.3 [2]	–22.9 [2]
Poland	–8.1	–7.3	8.6	–6.8	8.6	–8.6	–17.5	–4.8	–1.9	–2.9
Slovakia	2.3	–42.9	–2.2	0.1	15.0	–5.2	–	–7.6 [3]	–5.2 [3]	–2.4 [3]
Slovenia	–	–13.9	14.4	–11.2	5.5	–2.9	–	–2.1 [4]	–0.1 [4]	–2.1 [4]

* (Average annual wages in NCU x number of employees/production at current prices in NCU) x100.

Notes: 1) Growth rate motor vehicles, trailers and semi-trailers – growth rate total manufacturing. – 2) 1997–2001. – 3) 1997–2002. – 4) 1998–2002.

Source: wiiw Industrial Database; EU-15: Eurostat, New Cronos, SBS.

Table A 7b: Motor vehicles, trailers and semi-trailers (NACE 34), 1997–2003*

Unit labour costs, national currency, at **constant** 1999 prices (ULC_{cons})

									In % of total manuf.
	1996	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2002*
Czech Rep.	**7.40**	**6.45**	**7.00**	**7.06**	**6.47**	**6.20**	**6.29**	**6.18**	**57.0**
Estonia	**14.52**	**13.30**	**15.25**	**12.00**	**12.53**	**11.08**	**–**	**–**	**–**
Hungary	**3.88**	**3.50**	**3.22**	**2.97**	**3.09**	**3.77**	**4.25**	**4.21**	**42.9**
Latvia	**21.16**	**21.83**	**11.30**	**28.97**	**10.88**	**16.80**	**–**	**–**	**–**
Poland	**7.71**	**7.66**	**7.47**	**8.30**	**7.89**	**8.41**	**8.05**	**6.90**	**62.6**
Slovakia	**4.70**	**4.84**	**3.00**	**3.22**	**3.26**	**3.42**	**3.58**	**–**	**36.0**
Slovenia	**–**	**6.99**	**6.07**	**6.43**	**6.22**	**6.83**	**7.27**	**7.32**	**32.7**

	Annual change in %							*Av. annual change in %*		*Growth*	*$ULC_{cons(eur)}$ ***)*
	1997	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*97–03*	*Total manuf. 97–03*	*differential 1) in ppt 97–03*	*av. annual change in % 97–03*
Czech Rep.	**–12.8**	**8.5**	**0.9**	**–8.5**	**–4.1**	**1.5**	**–1.7**	**–2.5**	**1.3**	**–3.8**	**–1.6**
Estonia	**–8.4**	**14.6**	**–21.3**	**4.4**	**–11.6**	**–**	**–**	**–5.3 2)**	**1.0 2)**	**–6.2 2)**	**–6.0 2)**
Hungary	**–9.8**	**–8.0**	**–7.9**	**4.0**	**22.2**	**12.7**	**–1.0**	**1.2**	**4.2**	**–3.0**	**–2.8**
Latvia	**3.2**	**–48.2**	**156.4**	**–62.5**	**54.4**	**–**	**–**	**–4.5 2)**	**0.0 2)**	**–4.5 2)**	**–0.5 2)**
Poland	**–0.6**	**–2.5**	**11.0**	**–4.9**	**6.6**	**–4.2**	**–14.3**	**–1.6**	**–0.1**	**–1.5**	**–5.2**
Slovakia	**2.9**	**–38.1**	**7.4**	**1.2**	**5.1**	**4.5**	**–**	**–2.1 3)**	**0.8 3)**	**–2.9 3)**	**0.8 3)**
Slovenia	**–**	**–13.2**	**6.0**	**–3.4**	**9.9**	**6.4**	**0.7**	**0.8 5)**	**6.6 5)**	**–5.8 5)**	**6.6 5)**

* (Average annual wages in NCU x number of employees/production at constant 1999 prices in NCU) x100.

*** (Average annual wages in euro x number of employees/production at constant 1999 prices in NCU) x100.

Notes: 1) Growth rate motor vehicles, trailers and semi-trailers – growth rate total manufacturing. – 2) 1997–2001. – 3) 1997–2002. – 4) 1998–2002.- 5) 1998–2003.

Source: wiiw Industrial Database; EU-15: Eurostat, New Cronos, SBS.

Table A 8: Exports of road vehicles and sub-groups in total manufacturing exports of the NMS, 1996–2002

in %

Czech Rep.	SITC rev. 3	1996	1997	1998	1999	2000	2001	2002	Cumulative Change 97–02
road vehicles	78	10.0	13.1	14.2	15.7	16.2	16.4	19.1	91.3
passenger motor veh. ex. buses	781	4.6	6.3	7.6	8.3	8.8	9.0	11.5	146.8
goods, special-purpose veh.	782	0.9	1.5	1.1	0.7	0.7	0.3	0.2	–73.4
road motor vehicles, n.e.s.	783	0.4	0.3	0.3	0.3	0.3	0.3	0.3	–25.9
parts, bodies, tractors	784	3.3	4.2	4.6	5.7	5.8	6.3	6.6	103.1
Estonia									
road vehicles	78	6.2	8.5	4.7	3.7	4.2	5.0	5.5	–10.7
passenger motor veh. ex. buses	781	3.2	5.9	2.3	1.5	2.0	2.4	2.3	–28.9
goods, special-purpose veh.	782	0.3	0.3	0.4	0.2	0.2	0.3	0.3	–5.6
road motor vehicles, n.e.s.	783	0.1	0.1	0.1	0.1	0.2	0.2	0.4	281.5
parts, bodies, tractors	784	2.2	1.9	1.5	1.6	1.2	1.5	2.0	–8.1
Hungary									
road vehicles	78	4.8	6.3	6.6	9.5	9.3	9.6	9.3	91.8
passenger motor veh. ex. buses	781	0.5	1.9	2.6	5.7	5.4	5.2	4.6	907.8
goods, special-purpose veh.	782	0.2	0.1	0.1	0.1	0.0	0.1	0.1	–68.4
road motor vehicles, n.e.s.	783	1.0	1.3	0.6	0.3	0.3	0.4	0.2	–75.1
parts, bodies, tractors	784	2.2	2.1	2.7	2.6	2.8	3.2	3.6	64.0
Latvia									
road vehicles	78	2.3	1.6	1.2	0.7	0.6	0.7	0.9	–60.6
passenger motor veh. ex.buses	781	0.2	0.1	0.1	0.0	0.1	0.2	0.2	–16.8
goods, special-purpose veh.	782	0.3	0.2	0.2	0.1	0.1	0.2	0.1	–46.6
road motor vehicles, n.e.s.	783	0.6	0.0	0.0	0.0	0.0	0.1	0.2	–74.2
parts, bodies, tractors	784	0.7	0.8	0.6	0.2	0.1	0.2	0.3	–59.2
Lithuania									
road vehicles	78	7.4	8.6	8.6	3.7	4.3	7.4	10.2	36.3
passenger motor veh. ex. buses	781	5.7	6.7	6.7	2.0	2.8	5.7	7.9	39.1
goods, special-purpose veh.	782	0.2	0.2	0.2	0.1	0.1	0.3	0.4	121.0
road motor vehicles, n.e.s.	783	0.1	0.2	0.3	0.3	0.1	0.2	0.2	241.8
parts, bodies, tractors	784	0.8	0.7	0.6	0.5	0.4	0.3	0.5	–38.2
Poland									
road vehicles	78	6.0	6.4	7.6	9.0	10.2	9.6	10.0	66.4
passenger motor veh. ex. buses	781	3.5	3.3	3.8	4.4	4.9	4.2	3.7	3.7
goods, special-purpose veh.	782	0.7	0.8	1.3	1.4	1.5	1.1	1.4	87.8
road motor vehicles, n.e.s.	783	0.0	0.2	0.1	0.2	0.4	0.3	0.4	1,087.9
parts, bodies, tractors	784	0.9	1.4	1.6	2.1	2.6	3.2	3.8	310.3
Slovakia									
road vehicles	78	9.8	10.8	19.1	19.4	22.6	18.9	21.7	120.6
passenger motor veh. ex. buses	781	4.0	5.2	14.4	14.2	17.9	14.3	16.1	305.4
goods, special-purpose veh.	782	0.4	0.7	0.2	0.2	0.1	0.2	0.2	–51.6
road motor vehicles, n.e.s.	783	0.0	0.0	0.0	0.0	0.0	0.0	0.0	–15.3
parts, bodies, tractors	784	4.4	4.3	3.8	4.4	4.0	3.8	4.7	8.0
Slovenia									
road vehicles	78	12.4	12.1	14.6	13.1	12.4	11.8	12.5	1.0
passenger motor veh. ex. buses	781	9.5	9.4	11.0	9.4	8.7	8.0	8.3	–12.7
goods, special-purpose veh.	782	0.2	0.1	0.2	0.2	0.2	0.2	0.4	156.3
road motor vehicles, n.e.s.	783	0.1	0.1	0.4	0.2	0.1	0.1	0.2	114.1
parts, bodies, tractors	784	1.7	1.7	2.1	2.3	2.4	2.4	2.5	45.9

Source: UN-Trade database, wiiw calculations.

Table A 9: Road vehicles and sub-groups: world market shares[1)] of the NMS, 1996–2002

in %

Czech Rep.	*SITC rev. 3*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*
road vehicles	**78**	**0.47**	**0.62**	**0.82**	**0.82**	**0.89**	**1.04**	**1.42**
Passenger motor veh. ex. buses	**781**	**0.39**	**0.52**	**0.74**	**0.74**	**0.82**	**0.95**	**1.43**
goods, special-purpose veh.	**782**	**0.40**	**0.60**	**0.54**	**0.35**	**0.34**	**0.19**	**0.18**
road motor vehicles, n.e.s.	**783**	**0.47**	**0.44**	**0.45**	**0.43**	**0.49**	**0.56**	**0.71**
parts, bodies, tractors	**784**	**0.55**	**0.71**	**1.00**	**1.12**	**1.17**	**1.52**	**1.81**
Estonia								
road vehicles	**78**	**0.03**	**0.05**	**0.03**	**0.02**	**0.03**	**0.04**	**0.04**
Passenger motor veh. ex. buses	**781**	**0.02**	**0.06**	**0.02**	**0.01**	**0.02**	**0.03**	**0.03**
goods, special-purpose veh.	**782**	**0.01**	**0.01**	**0.02**	**0.01**	**0.01**	**0.02**	**0.02**
road motor vehicles, n.e.s.	**783**	**0.01**	**0.01**	**0.01**	**0.01**	**0.04**	**0.06**	**0.09**
parts, bodies, tractors	**784**	**0.03**	**0.04**	**0.04**	**0.03**	**0.03**	**0.04**	**0.05**
Hungary								
road vehicles	**78**	**0.13**	**0.24**	**0.30**	**0.46**	**0.48**	**0.53**	**0.53**
Passenger motor veh. ex. buses	**781**	**0.02**	**0.13**	**0.20**	**0.46**	**0.48**	**0.48**	**0.44**
goods, special-purpose veh.	**782**	**0.05**	**0.03**	**0.02**	**0.03**	**0.02**	**0.03**	**0.03**
road motor vehicles, n.e.s.	**783**	**0.72**	**1.46**	**0.68**	**0.45**	**0.56**	**0.84**	**0.49**
parts, bodies, tractors	**784**	**0.21**	**0.29**	**0.46**	**0.48**	**0.54**	**0.68**	**0.76**
Latvia								
road vehicles	**78**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Passenger motor veh. ex. buses	**781**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
goods, special-purpose veh.	**782**	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**
road motor vehicles, n.e.s.	**783**	**0.05**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.02**
parts, bodies, tractors	**784**	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Lithuania								
road vehicles	**78**	**0.05**	**0.06**	**0.05**	**0.02**	**0.03**	**0.06**	**0.08**
Passenger motor veh. ex. buses	**781**	**0.06**	**0.08**	**0.07**	**0.02**	**0.03**	**0.08**	**0.10**
goods, special-purpose veh.	**782**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.02**	**0.03**
road motor vehicles, n.e.s.	**783**	**0.01**	**0.04**	**0.05**	**0.04**	**0.03**	**0.06**	**0.05**
parts, bodies, tractors	**784**	**0.02**	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
Poland								
road vehicles	**78**	**0.31**	**0.33**	**0.43**	**0.46**	**0.60**	**0.63**	**0.67**
Passenger motor veh. ex. buses	**781**	**0.32**	**0.30**	**0.37**	**0.38**	**0.49**	**0.46**	**0.41**
goods, special-purpose veh.	**782**	**0.33**	**0.34**	**0.64**	**0.68**	**0.81**	**0.67**	**0.89**
road motor vehicles, n.e.s.	**783**	**0.05**	**0.30**	**0.19**	**0.34**	**0.81**	**0.75**	**0.98**
parts, bodies, tractors	**784**	**0.17**	**0.25**	**0.33**	**0.41**	**0.57**	**0.81**	**0.94**
Slovakia								
road vehicles	**78**	**0.16**	**0.22**	**0.42**	**0.38**	**0.48**	**0.46**	**0.51**
Passenger motor veh. ex. buses	**781**	**0.11**	**0.19**	**0.55**	**0.48**	**0.65**	**0.58**	**0.64**
goods, special-purpose veh.	**782**	**0.06**	**0.12**	**0.04**	**0.03**	**0.03**	**0.04**	**0.05**
road motor vehicles, n.e.s.	**783**	**0.01**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.01**
parts, bodies, tractors	**784**	**0.25**	**0.32**	**0.32**	**0.33**	**0.31**	**0.35**	**0.41**
Slovenia								
road vehicles	**78**	**0.24**	**0.22**	**0.28**	**0.22**	**0.21**	**0.21**	**0.22**
Passenger motor veh. ex. buses	**781**	**0.32**	**0.30**	**0.36**	**0.27**	**0.25**	**0.24**	**0.25**
goods, special-purpose veh.	**782**	**0.03**	**0.02**	**0.03**	**0.02**	**0.02**	**0.03**	**0.07**
road motor vehicles, n.e.s.	**783**	**0.04**	**0.06**	**0.21**	**0.09**	**0.04**	**0.05**	**0.10**
parts, bodies, tractors	**784**	**0.12**	**0.11**	**0.15**	**0.15**	**0.15**	**0.17**	**0.17**

Note: 1) exports of individual countries divided by world exports in the same SITC group.

Source: UN-Trade database, wiiw calculations.

Table A 10: Road vehicles and sub-groups: revealed comparative advantage (RCA)[1)] of the NMS, 1996–2002

in %

Road vehicles (SITC 78)	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*
Czech Republic	**19.4**	**36.7**	**61.9**	**62.4**	**68.6**	**61.9**	**61.8**
Hungary	**–42.3**	**1.9**	**–15.2**	**1.4**	**12.2**	**15.7**	**3.1**
Poland	**–34.2**	**–45.9**	**–31.8**	**–16.6**	**7.6**	**6.4**	**–1.3**
Slovakia	**–35.9**	**–13.7**	**28.1**	**39.1**	**49.7**	**31.0**	**44.4**
Slovenia	**–10.3**	**–8.3**	**3.2**	**–13.4**	**7.1**	**–2.1**	**6.1**
Estonia	**–26.9**	**–41.7**	**–68.3**	**–60.4**	**–60.5**	**–59.9**	**–59.7**
Latvia	**–103.9**	**–164.9**	**–214.9**	**–253.7**	**–257.3**	**–259.0**	**–237.4**
Lithuania	**–46.8**	**–42.8**	**–46.1**	**–73.2**	**–79.7**	**–59.6**	**–28.3**
Passenger motor vehicles excl. buses (SITC 781)							
Czech Republic	**30.2**	**64.3**	**121.5**	**117.8**	**136.2**	**138.3**	**107.4**
Hungary	**–200.6**	**–16.3**	**–5.2**	**66.1**	**72.8**	**57.0**	**26.2**
Poland	**18.1**	**8.4**	**15.6**	**11.0**	**19.0**	**–8.9**	**–35.2**
Slovakia	**–86.6**	**16.3**	**110.3**	**130.5**	**165.3**	**123.2**	**143.0**
Slovenia	**28.2**	**37.0**	**56.5**	**20.2**	**53.0**	**41.1**	**52.8**
Estonia	**–10.8**	**–33.1**	**–73.4**	**–92.7**	**–82.6**	**–82.3**	**–95.3**
Latvia	**–226.1**	**–374.5**	**–345.9**	**–435.1**	**–361.2**	**–314.9**	**–309.1**
Lithuania	**–32.1**	**–19.1**	**–24.2**	**–77.9**	**–66.8**	**–35.4**	**–13.2**
Goods, special transport vehicles (SITC 782)							
Czech Republic	**–18.9**	**21.0**	**29.0**	**–6.3**	**–7.2**	**–88.1**	**–123.5**
Hungary	**–213.5**	**–261.2**	**–339.0**	**–311.0**	**–318.6**	**–298.0**	**–313.8**
Poland	**30.9**	**38.6**	**53.6**	**51.5**	**55.2**	**26.5**	**5.0**
Slovakia	**–119.9**	**–86.9**	**–162.9**	**–162.4**	**–167.5**	**–168.0**	**–171.4**
Slovenia	**–211.0**	**–228.2**	**–204.6**	**–227.0**	**–217.0**	**–199.0**	**–137.4**
Estonia	**–184.7**	**–198.2**	**–174.2**	**–174.5**	**–165.6**	**–143.3**	**–152.2**
Latvia	**–212.9**	**–272.2**	**–267.5**	**–268.9**	**–276.5**	**–224.6**	**–260.3**
Lithuania	**–200.6**	**–180.0**	**–169.4**	**–189.3**	**–171.6**	**–142.9**	**–104.5**
Road motor vehicles n.e.s. (SITC 783)							
Czech Republic	**–25.7**	**–53.7**	**–75.3**	**–76.1**	**–85.4**	**–100.6**	**–81.4**
Hungary	**45.7**	**132.0**	**21.1**	**–25.7**	**9.9**	**25.2**	**–51.5**
Poland	**–145.5**	**12.9**	**–117.0**	**–26.0**	**13.1**	**–32.1**	**–47.6**
Slovakia	**–380.8**	**–328.3**	**–315.1**	**–257.4**	**–311.2**	**–362.2**	**–379.4**
Slovenia	**–158.2**	**–127.6**	**–46.2**	**–97.3**	**–154.2**	**–173.3**	**–108.9**
Estonia	**–103.1**	**–167.9**	**–147.1**	**–165.7**	**–74.2**	**–111.8**	**–82.3**
Latvia	**107.0**	**–263.7**	**–476.5**	**–337.6**	**–348.9**	**–348.1**	**–233.5**
Lithuania	**–258.4**	**–215.3**	**–157.5**	**–108.2**	**–234.7**	**–208.3**	**–186.1**
Parts, bodies, tractors (SITC 784)							
Czech Republic	**29.6**	**24.5**	**30.6**	**40.8**	**40.4**	**32.6**	**43.7**
Hungary	**60.7**	**19.2**	**5.7**	**–44.5**	**–28.2**	**–1.0**	**15.5**
Poland	**–146.8**	**–140.9**	**–120.4**	**–83.3**	**–31.4**	**21.9**	**51.6**
Slovakia	**92.6**	**–18.1**	**–65.6**	**–56.2**	**–76.1**	**–65.4**	**–48.0**
Slovenia	**–93.4**	**–99.6**	**–92.8**	**–67.6**	**–53.9**	**–53.7**	**–50.8**
Estonia	**37.2**	**38.9**	**18.3**	**31.7**	**39.7**	**41.2**	**52.8**
Latvia	**–73.9**	**–51.7**	**–93.9**	**–217.1**	**–214.0**	**–195.1**	**–156.7**
Lithuania	**–39.1**	**–42.5**	**–61.7**	**–75.3**	**–78.0**	**–85.2**	**–40.7**

Note: 1) Revealed comparative advantage (RCA) defined as: $RCA_{ij} = 100 \ln \left[\frac{X_{ij} / M_{ij}}{\left(\sum_j X_{ij}\right) / \left(\sum_j M_{ij}\right)} \right]$
Where Xij (Mij) are exports (imports) of industry j of country i.

Source: UN trade database, wiiw calculations.

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