

## The Automobile Industry in Central Europe<sup>1</sup>

*The automobile industry is (literally) becoming a driving force of economic development in the Visegrad countries of Central Europe<sup>2</sup>. The establishment of assembly plants has recently attracted additional foreign direct investment by auto parts suppliers, contributing to increasing industry specialization in the region. This note looks at the role and prospects of the automobile industry, particularly the macroeconomic impact on output and value-added, labor markets and competitiveness. There are also implications for the balance of payments and fiscal accounts, but little information is available in this area.*

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### General background

**Over the last decades, the global automobile industry has undergone far-reaching structural changes.** While in the past car companies produced almost the entire vehicle within their production lines, large parts of value-added are now outsourced, assigning a much larger role to auto parts suppliers than in the past. This was made possible by modularization<sup>3</sup> and the design of common under-body platforms. The advantage of this strategy is that it enables car producers to benefit from economies of scale as they can build more car models on the same platform, a trend strengthened by recent consolidation in the global car industry. As a result of this “LEGO” approach, the assembly stage of car production itself contains relatively little value-added.

**A high level of competition in the industry is forcing car producers to aggressively seek cost optimization.** Increasing competition is the result of structural overcapacity<sup>4</sup> at a global level, further aggravated by the development of production sites in emerging markets. At the same time, producers find it difficult to close facilities at traditional sites (e.g. in Germany). Competition is particularly fierce for small types of passenger cars. The narrowing of profit margins especially forces producers of lower segment cars to shift production to countries with lower production cost. Premium segment cars are, for the time being, still largely assembled at traditional sites.

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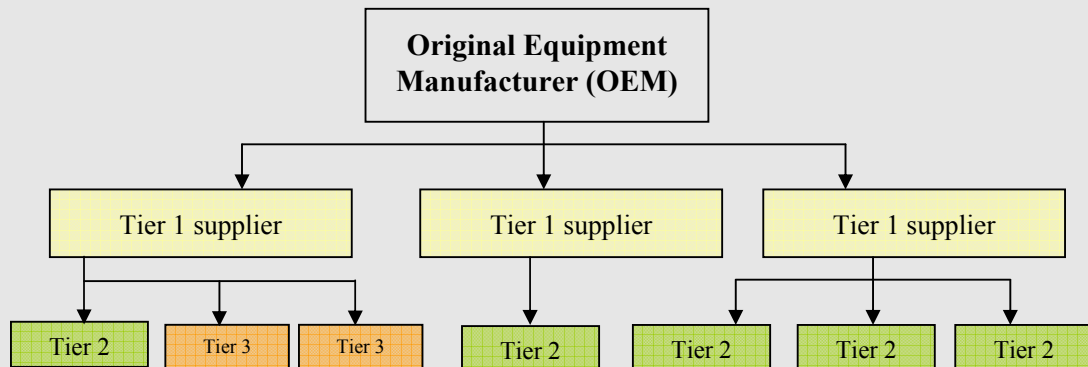
<sup>1</sup> The primary author of this note is Marcel Tirpak (economist in the Warsaw regional office), with research assistance from Agata Kariozen. The note has benefited from personal discussions with government officials, representatives from national automobile industry associations and selected companies in the Czech Republic, Hungary, Poland and the Slovak Republic. The final version of this note was written in November 2006.

<sup>2</sup> The Czech Republic, Hungary, Poland, and the Slovak Republic.

<sup>3</sup> Modularization is related to further specialization of auto parts suppliers, driven by the increasing complexity of car components. Final producers usually keep engine and chassis production within the assembly, while the rest is outsourced to their suppliers. These are responsible for R&D, design, and production of particular modules, as well as for their just-in-time delivery.

<sup>4</sup> For a more detailed description structural overcapacities see European Competitiveness Report 2004; European Commission 2005; p. 167.

**Box 1.** The structure of the automobile industry (based on European Commission, 2005)



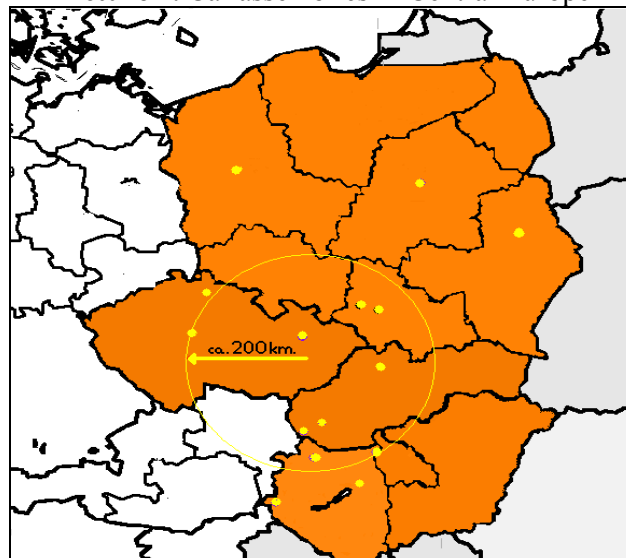
An Original Equipment Supplier (OEM) – [e.g. **VOLKSWAGEN, PEUGEOT**] – manufactures and/or assembles the final product. The final product bears the company's brand name, but various components (tires, breaks, seats, etc.) are manufactured by parts suppliers.

Tier 1 (systemic) supplier – [e.g. **BOSCH, VALEO**] – delivers directly to the final assembly. Systemic suppliers closely co-operate with OEM's to design, manufacture and deliver complex modules. Systemic suppliers are mostly multinational companies which supply more than one OEM. Links between the OEM and its traditional suppliers (national bias) are weakened by the ongoing consolidation of industry and increasing competition. Tier 1 suppliers purchase from lower-tier suppliers.

Tier 2 (Tier 3) supplier – [e.g. **AUTOMOTIVE SAFETY COMPONENTS Int. s.r.o. - airbags**] - produces parts in the minor sub-assembly phase of respective modules. Tier 2 suppliers deliver to Tier 1 suppliers, in some specific cases they may also supply OEM's directly. Lower rank suppliers (Tier 3) deliver their production (e.g., engineered materials and services) to Tier 2 suppliers.

The new assembly facilities are built with the latest technology, making these sites attractive not only in terms of lower labor costs, but also productivity. Car producers (OEMs) encourage their systemic suppliers to localize their production of auto parts and network of lower rank suppliers.

**Picture 1.** Car assemblies in Central Europe

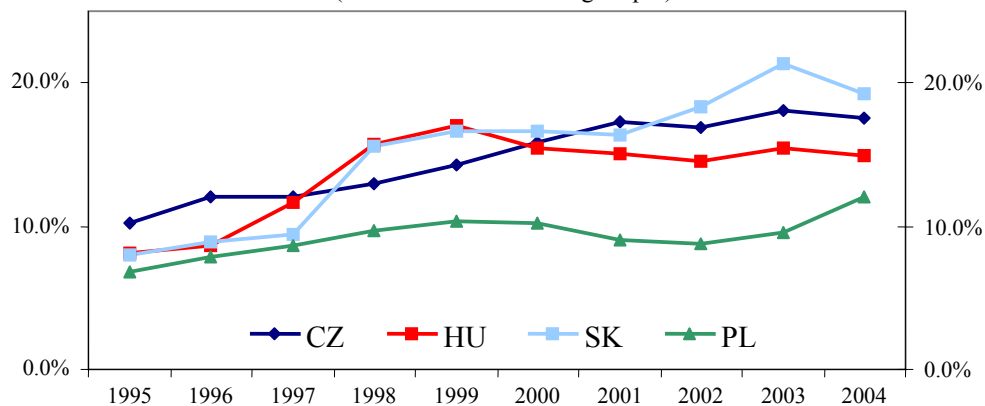


**Assembly plants in the region have clustered in a relatively small area, spanning West Slovakia, Eastern and Central Czech Republic, Southern Poland and Northern Hungary.** This is underpinned by a fairly well developed road and railway infrastructure. Car assembly dependence on the just-in-time auto parts deliveries from suppliers demands efficient logistic network. This is also important for the sale of final products, where the proximity to both Western and Eastern markets is proving advantageous.

### Output and Value-added

**The automobile sector represents almost 16 percent of output and 10 per cent of value-added in Central European manufacturing.** Based on announced investments into new car assemblies and auto part suppliers production these ratios are expected to increase in the coming years. The most specialized countries are the Czech Republic and Slovakia, while in Poland and Hungary car production plays a smaller role.

**Chart 1. Manufacture of transport equipment\***  
(% of total manufacturing output)



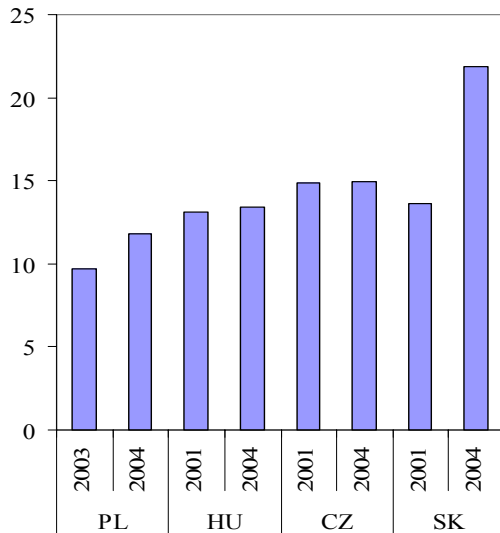
\* Manufacture of transport equipment (DM), NACE classification.

Source: WIIW Handbook of Statistics

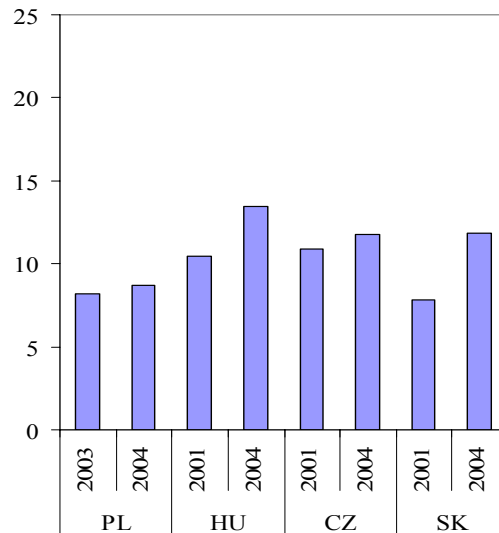
**The contribution of the car industry to gross value added in manufacturing is at the moment still lower than its contribution to manufacturing output.** This is due to the dominant role of car assemblies within the automobile industry. As mentioned above, assemblies account only for a small share of value-added because; the center of value-added creation has shifted to auto part suppliers. However, in Hungary the car industry has lately seen higher growth dynamics of value-added than in output — a trend that is likely to be repeated elsewhere in the region (Chart 2A, 2B).

**Automobile production in Central Europe has increased on average by 60% since 2001.** A further substantial increase of capacity in the region can be expected, particularly in the Czech Republic and Slovakia. This is due to the expected launch of production in several assemblies which in the case of Slovakia will lead to more than three-fold increase of car production by 2010. The production increase in the Czech Republic will be less significant, mostly due to already high capacity. The Czech Republic and Slovakia will account for almost 65 percent of the total car production of the region by 2010.

**Chart 2A. Manufacture of transport equipment - output**  
(% of total manufacturing output)



**Chart 2B. Manufacture of transport equipment - GVA**  
(% of total manufacturing GVA)



Source: Eurostat, staff calculations

**The impact of the car industry on overall economic activity goes beyond its statistical definition.** This is due to backward and forward (or upstream and downstream) linkages within the industry. Backwards linkages in the car industry manifest themselves in its dependency on inputs from other industrial sectors (steel and metal products, high-tech manufacturing, etc.). It is also documented by the above-mentioned difference between the car industry's contribution of production and value-added to manufacturing. Forward linkages are mostly car repair services, fuel stations, car wash facilities, etc. These inter-industry linkages increase the importance of car manufacturing in terms of both the production, and number of employees. An Input/Output analysis for year 2000 (the latest data available) suggests only modest feedback effects, but this may have changed with the recent growth of the industry.

## Box 2. GDP contribution of the car industry

The GDP contribution of the car industry was highest in the Czech Republic and Slovakia, where it lately has explained about one fifth of total GDP growth.

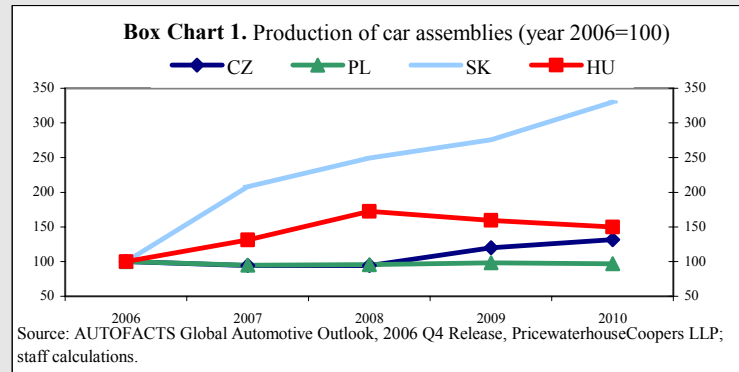
**Box Table 1. GDP contribution to car industry**

	2005		average (2001-2005)	
	real GDP growth (%)	contribution (in p.p.)	real GDP growth (%)	contribution (in p.p.)
CZ	6.08%	1.16	3.65%	0.37
HU	4.87%*	0.21*	4.33%	0.19
PL	3.24%	0.07	2.97%	0.20
SK	6.04%	1.41	4.59%	0.59

Source: Eurostat, CSOs, staff calculation.

\*2004

Looking forward, the car industry's impact on the economy is likely to increase. Box Chart 1 shows that in Slovakia the amount of produced cars is projected to increase substantially during coming years. In the Czech Republic and Hungary the increase will be modest, while stable production is expected in Poland.



Significant increases of production capacity will likely lead to a further strengthening of the car industry's role in Slovakia, while in Hungary and the Czech Republic the contribution is less clear-cut. In Poland the role of the car industry may decrease as output flattens and other sectors grow. The expected development of the auto parts suppliers' base will further enhance the car industry's contribution to GDP.

## Labor market and Competitiveness

**Employment in the automobile sector is growing at a steady pace.** Within the manufacturing sector, the car industry directly accounts for about 8 percent of total employees. Looking at employment data, a growing specialization of the work force in the Czech Republic and Slovakia is evident. The launch of new car assemblies together with the expected development of suppliers network will contribute to additional demand for automobile industry workers.

**Table 1.** Employment in automotive industry

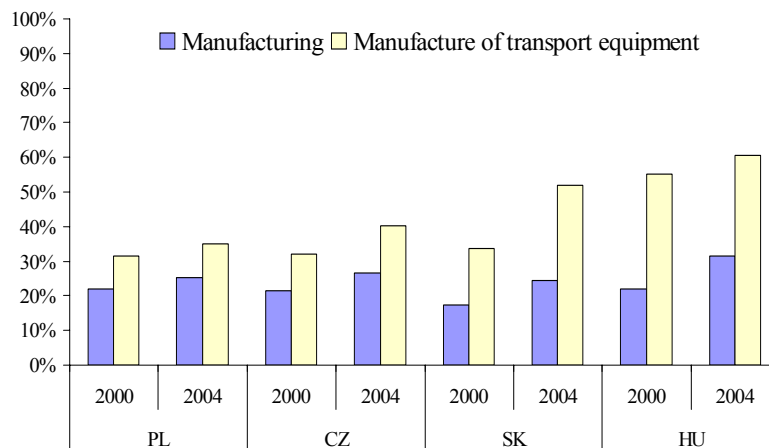
	1999	2005
<b>Employment (thous.)</b>		
Czech Republic	69	103
Hungary	53	59
Poland	99	102
Slovakia	36	57
<b>Employment in automotive industry (in % of total employment in manufacturing)</b>		
Czech Republic	5.0	7.5
Hungary	5.7	6.8
Poland	3.4	4.0
Slovakia	6.6	10.9
<b>Employment in automotive industry (in % of total employment in manufacturing)</b>		
Czech Republic	1.45	2.16
Hungary	1.39	1.51
Poland	0.67	0.72
Slovakia	1.67	2.59

Source: Eurostat, National authorities, ACEA, EMED, staff calculations.

**A major strength of the Central European region is its qualified and inexpensive workforce.** Qualification of automobile sector workers of all skill levels is driven by a long-standing tradition of machinery and transport equipment manufacturing in the region. While recent numbers suggest that gross wages in automobile sector are above average of overall manufacturing, they are still well below the levels of wages in Western Europe. Wage growth in the automobile industry is recently gaining momentum, but representatives of the automotive industry are not concerned. They point to accompanying productivity improvements.

**The labor productivity of automotive industry in Central Europe is still below the European Union (EU-15) average, but is growing rapidly.** Compared to labor productivity in the manufacturing sector, the car industry is leading in all countries of the region. This is closely related to better technology, which is installed in new production lines (Chart 3). Rapidly growing labor productivity accompanied by low labor costs are a unique combination, which strongly supports competitiveness of the car producers in the region (Table 2).

**Chart 3.** Labor productivity\* (percent of EU15 labor productivity)



\*Poland: Data on productivity in Manufacture of transport equipment are for 2003 and 2004.  
Source: Eurostat, staff calculations.

**Labor market bottlenecks may emerge particularly among medium-skilled workers.** Representatives of automobile industry associations in the region say that the labor market capacity with regard to car assemblies is close to saturation. This is also evidenced by the increasing migration of workers within the region, often promoted and coordinated at the car assembly level. For example, a significant number of Slovaks is commuting daily to Hungary

**Table 2.** Unit Labor Cost in automobile industry (in % of German ULC)

	2000	2004
Czech Republic	42.3	44.5
Hungary	25.6	35.9
Poland	61.0*	48.8
Slovakia	29.0	21.5

Source: Eurostat, WIIW, German CSO.

\*data for 2003

(Suzuki), and to the Czech Republic (Skoda). With the start of production of new car assemblies in Slovakia, this trend could soon be reversed. The increasing demand for labor force may push wages of workers upward—possibly even beyond productivity improvements.

**The competitive advantage of labor cost in Central Europe is present across a wide array of labor market segments.** Car production in the region attracts also relocations of R&D centers from Western Europe. Most of these projects are performed by auto parts suppliers. However, high value-added activities, such as the design of new automobiles, mostly remain in their home countries.

**The risk of possible relocation of assembly due to wage developments seems low.** Automobile executives estimate the minimum life cycle of an assembly plant in the range of 7 - 10 years. They reject the possibility of a re-location, any time soon, of assemblies from Central Europe to emerging economies like India and China or Romania and Bulgaria mainly due to their remoteness and the weaker industrial base.

### Balance of payments

**The automobile industry may affect both current account and capital account through various channels (Table 3).** The automobile industry's overall impact on the balance of payments is expected to be positive, but not clear-cut. The strongest impact comes from the improvement of exports, reflected by the outward-oriented strategy of investors. The ratio of exported production to total exports ranges from around 8 percent in Hungary to almost 25 percent in Slovakia.

**Table 3.** BoP effects of auto industry

CREDIT	DEBIT
Current Account	
<u>Export</u> - the strongest impact since a major part of production is exported.	
	<u>Import</u> - import of auto parts may decrease over time with development of domestic networks of auto part suppliers; - import of investment units (machinery, technology equipment) for the production line (short-term impact).
<u>Wages</u> - wages paid to management (minimal impact); - wages earned by domestic workforce commuting abroad.	<u>Wages</u> - wages paid to foreign workforce regularly commuting from abroad.
	- repatriation of profits by parent company; - servicing intra-company loans.
Capital Account	
<u>Long-term investments</u> - inflow of FDI's connected with the initial development; - additional investments (reinvested profit).	
<u>Loans</u> - intra-company loans.	<u>Loans</u> - repayment of intra-company loans.

**There are important temporary effects on the BoP related to the establishment of new plants.** Among the most visible are foreign direct investments inflows, and the increase of so-called investment imports (i.e. machinery and equipment for production lines in the assembly). Table 4 shows inward FDI stocks in the car industry, mostly car assemblies (unfortunately the data are not very well comparable as some include loans and others do not). Investments of auto parts suppliers, which are also important, cannot be easily derived from the aggregate numbers.

**Table 4.** Inward FDI stocks in automobile industry (2005)

	mn EURO	in % of	
		FDI in manufacturing	Total FDI
Czech Republic 2/	3472	18.9	6.9
Hungary 1/	4387	24.6	9.5
Poland 1/ 2/	4465	18.8	7.1
Slovakia	515	11.7	4.0

Source: WIIW

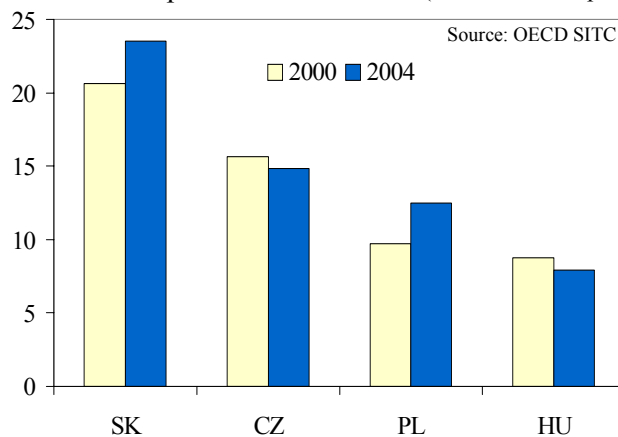
1/ 2004,

2/ also includes loans

**To date, the car industry has mainly boosted export performance in Slovakia and Poland (Chart 4).** Export

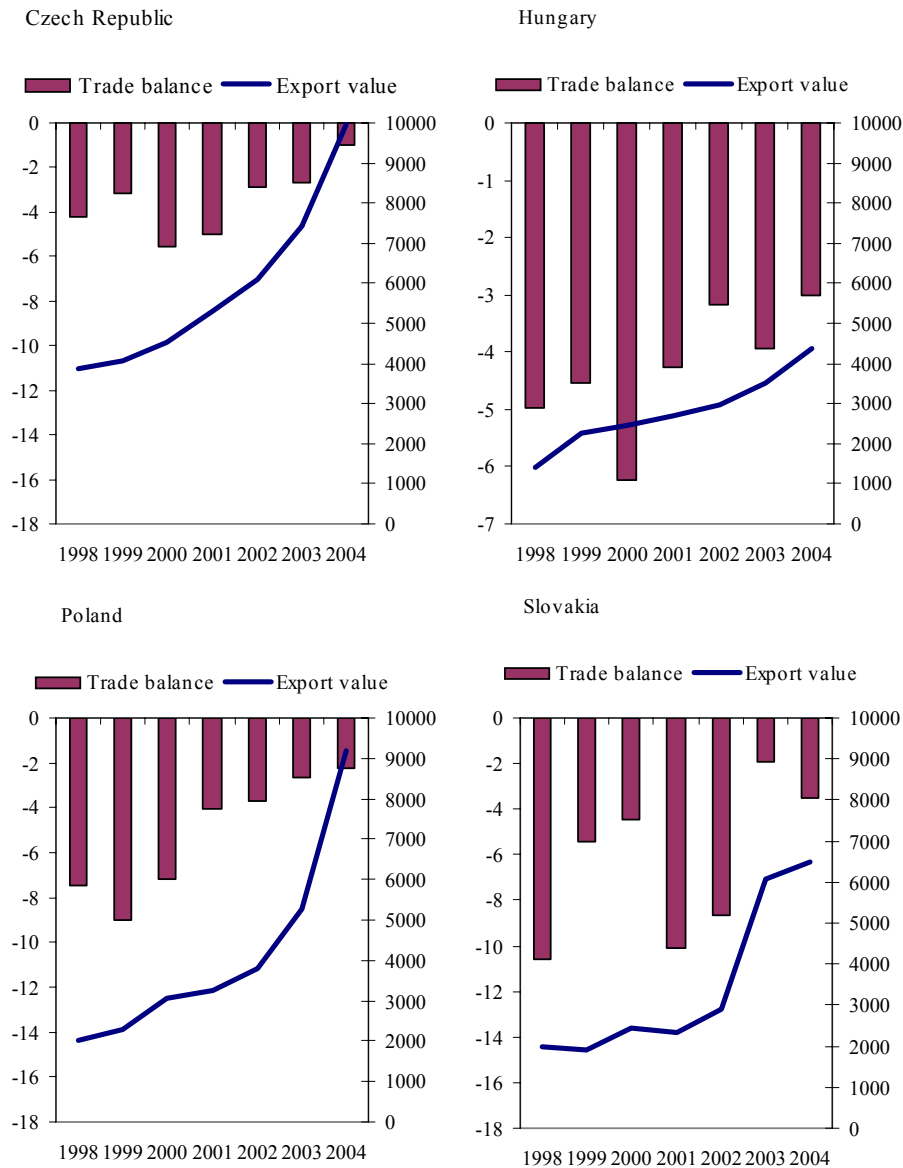
values doubled in the Czech Republic, but the relatively stable ratio of the car industry's exports in overall export shows that this was part of a broader based improvement of export performance. There is a noticeable correlation between higher exports and an improvement of the trade balance, especially in Slovakia (Chart 5).

**Chart 4.** Export of road vehicles (as % of total export)





**Chart 5. Export of road vehicles (nom, USD thous.) and trade balance (in % of GDP)**

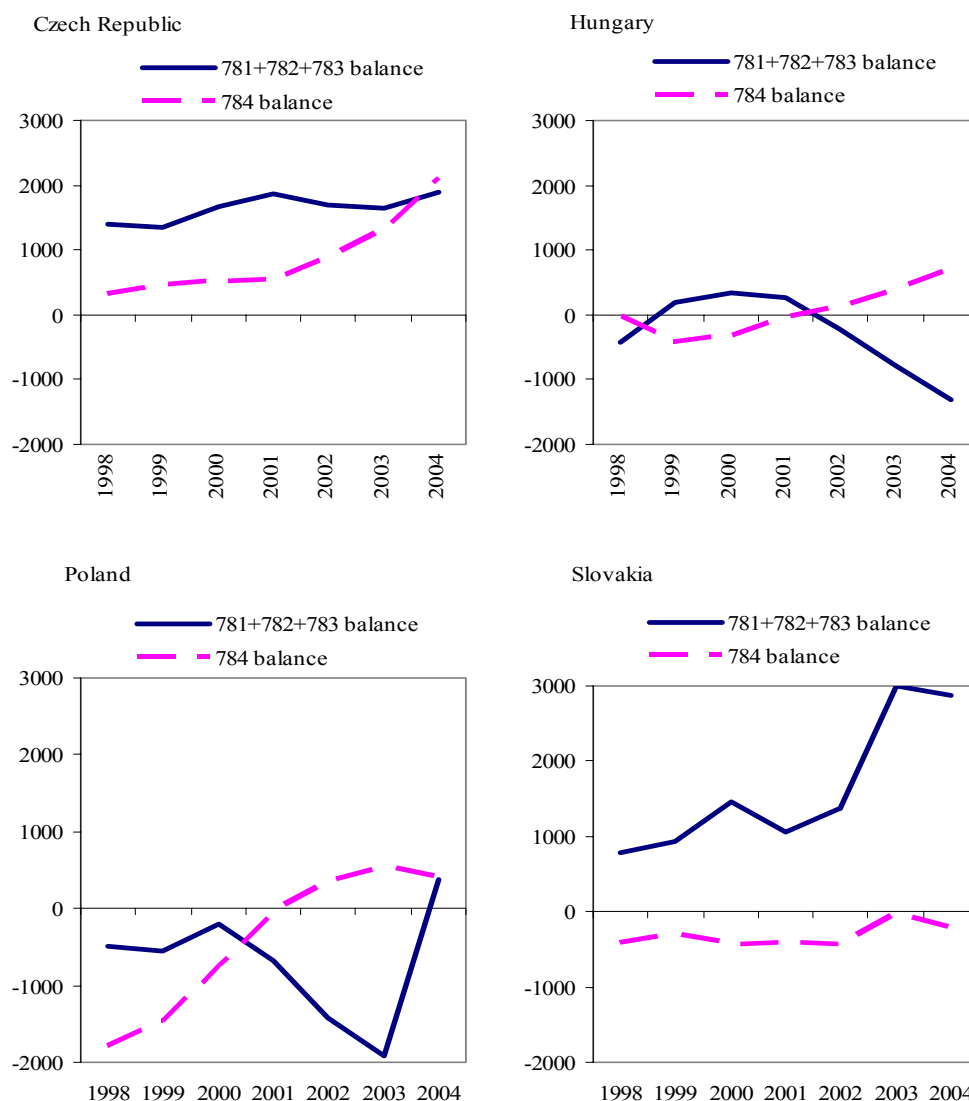


Source: OECD, Eurostat, staff calculations.

**The positive impact of growing export is partly offset by the strong import dependence of the automobile production.** This is clearly visible in Slovakia, where the trade balance of auto parts is negative. Chart 6 confirms the trend mentioned above, i.e. the increasing localization of systemic suppliers (Tier 1) within the country. Apart from Slovakia, all remaining countries of the region are now net exporters of auto parts. Auto parts production has become a driving force of the automobile industry in Hungary,

while car assembling seems to play a dominant role in Slovakia. The lagged improvement of the trade balance of auto parts is related to the strategy of systemic suppliers: first they deliver parts from their production facilities abroad; after reaching a 'critical level' of demand from the OEM, they find it attractive to set up a production site closer to the assembly. Industry representatives also point to the capacity constraints of parts suppliers already present in the region. In Poland, the sudden improvement of the trade balance in 2004 was caused by the production launch of new types of passenger cars in (in GM and Fiat assemblies), which offset the ongoing increase of used car imports from Germany.

**Chart 6.** Trade balance of road vehicles (781+782+783)  
and trade balance of part and accessories of vehicles (784)  
(in mn USD)

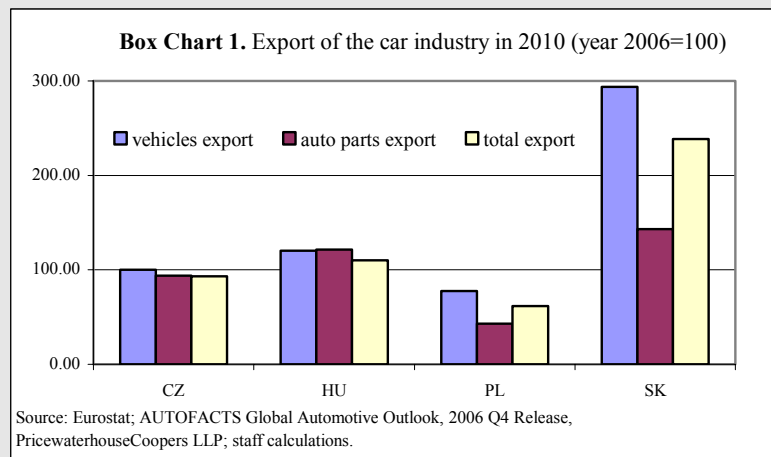


Source: OECD, Eurostat, staff calculations.

- 781 Motor vehicles for the transport of persons
- 782 Motor vehic. for transport of goods, special purpo.
- 783 Road motor vehicles, n.e.s.
- 784 Parts & accessories of vehicles of 722, 781, 782, 783

### Box 3. Projection of export of cars and components

We estimate the export growth in the car industry using data on expected production in 2010. We set the share of production that is exported as constant, and we assume a stable ratio between vehicles and auto parts.



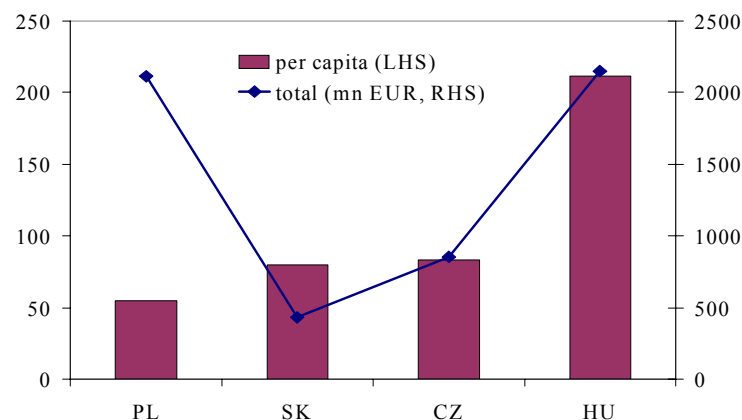
The highest increase of exports is expected in Slovakia, followed by Hungary and the Czech Republic. In Poland we expect a decline of export in the automobile sector due to the lower production of cars projected by industry experts. The expected development of suppliers' base in respective economies could give an additional boost to countries' export performance.

### Fiscal impact

**The fiscal impact of the car industry is difficult to establish due to the case-specific and mostly confidential treatment of the investments contracts with governments.**

Available data on public aid in manufacturing sector allow to show some general trends. Hungary is a leader in offering public aid, both in nominal terms and per capita terms. Audi's recent decision to put on hold a major investment in its Hungarian assembly due to tax hikes, which government deemed necessary to stabilize public finances, highlights the links between fiscal policy and the car industry.

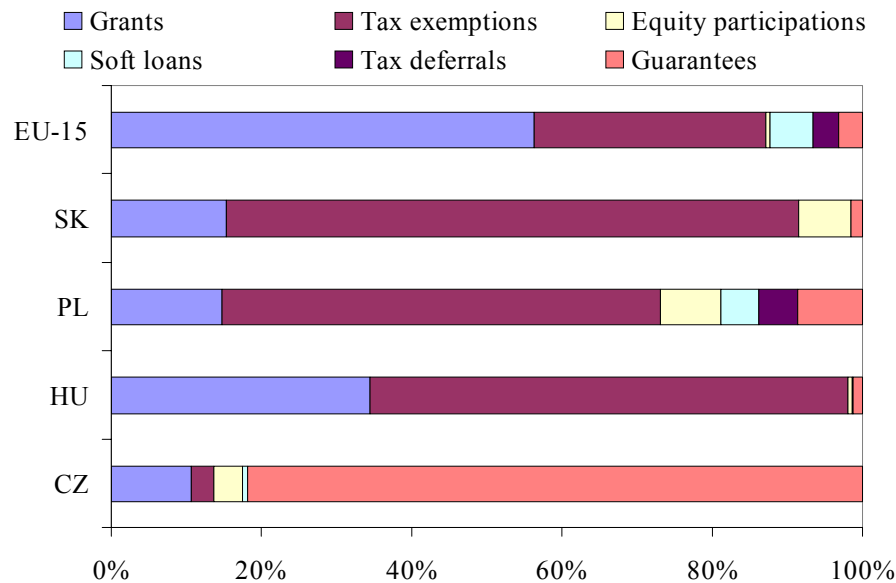
**Chart 7. Public aid in manufacturing 2000-2004 (EUR, 1995 prices)**



Source: DG Competition, Eurostat, staff calculations.

**The major tool of public aid in the region are tax exemptions and grants, which have a direct impact on public finances.** In the Czech Republic, state guarantees play an important role. Apart from direct aid measures, which are negotiated on a case-specific basis, there are also general development initiatives of central and/or regional governments. These are the development of transport infrastructure (highways, railways), industry zones and parks with basic infrastructure, etc. Some government representatives (mostly in the Czech Republic) point to the shift of the role of government agencies from direct financial support to information support. This is mostly relevant for the development of the auto industry suppliers' base<sup>5</sup>.

**Chart 8.** Public aid in manufacturing by instruments in 2000-2004



Source: DG Competition

<sup>5</sup> Government investment agencies with co-operation of national auto industry associations are providing databases of auto industry suppliers located in the country. This is considered to be an important means of information support for the further development of the industry.