

Employment, Skills and occupational trends in the automotive industry

(Annex Report)

Terry Ward (Alphametrics, Cambridge/Brussels: tw@applica.be)

Patrick Loire (Groupe Alpha, Paris: p.loire@groupe-alpha.com)

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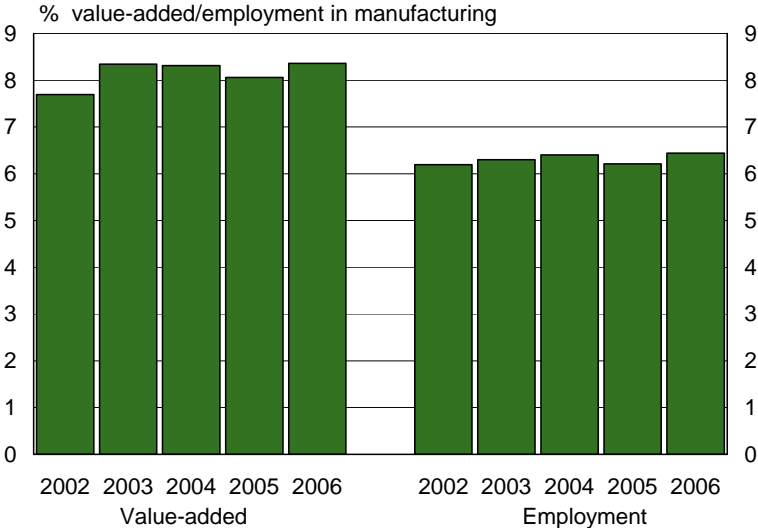
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1. Employment in the automotive industry – Main features

Importance of automotive industry in the EU economy

According to the latest data available, value-added in the automotive industry represents around 8.5% of total value-added generated by manufacturing in the EU (27 Member States) (Figure 1). Since manufacturing accounts for just over 17% of total GDP, this means that the automotive industry is responsible for around 1.5% of the total output (and income) produced by the EU economy¹.

1 Value-added and employment in automotive industry in the EU27, 2002-2006



The automotive industry accounts for around 6.5% of total employment in manufacturing in the EU, or just over 1% of total employment in the economy as a whole. The industry is, therefore, more important in the generation of value-added than as a source of employment, at least in direct terms, since these figures do not take account of the substantial indirect employment to which the industry gives rise. Industries supplying automotive producers themselves account for significant employment. Indeed, estimates suggest that if employment in supplying industries and services is taken into account, the industry is responsible for some 3-4 times as many jobs as are recorded in the industry itself,

In addition, as shown below the automotive industry is responsible for a substantial proportion of exports of EU countries and, therefore, for an equally substantial share of foreign exchange earnings which supports job creation in other parts of the economy.

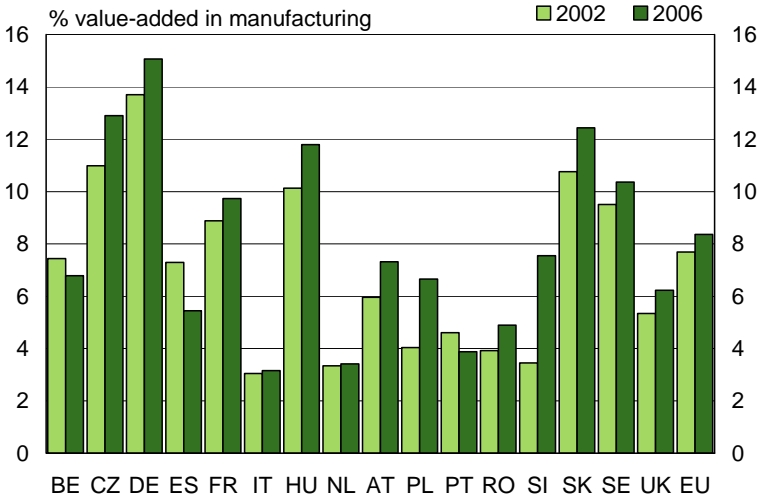
¹ These and other figures quoted in this section are based on the National accounts and the Structural Business Statistics compiled by Eurostat. Since the latest national accounts data disaggregated by branch, or sector, are for 2005, the figure for 2006 has been estimated on the basis of employment data (on the assumption that the growth of labour productivity in the automotive industry in this year was in line with that in the rest of the economy, which accord with past experience).

The implication of the value-added and employment figures is that productivity in the industry is around 30% higher than in manufacturing, which in turn has much the same level of productivity as the rest of the economy in aggregate. As indicated below, however, productivity in the industry varies considerably across countries, especially as between the EU15 countries and the new Member States.

Variation in the importance of the industry across countries

The importance of the automotive industry in terms of its direct contribution to value-added and employment varies markedly across the EU. It is most important in terms of both value-added and employment in Germany, where it accounts for around 15% of manufacturing value-added and just over 3% of German GDP (Figure 2. In addition, it accounts for around 13% of employment in manufacturing and 2.5% of total employment in the economy (Figure 3).

2 Value-added in the automotive industry, 2002 and 2006

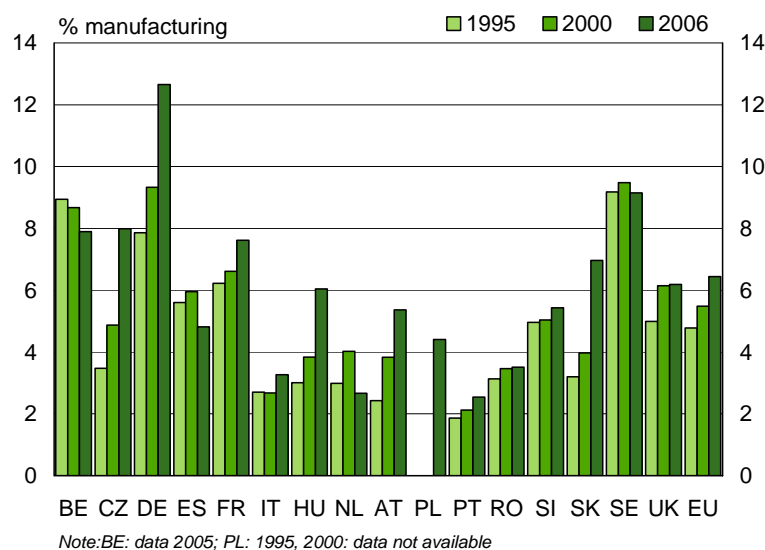


The industry is only slightly less important in the Czech Republic, where it accounts for around 14% of the value-added generated by manufacturing and 3% of GDP. In both cases, these figures are significantly more than its contribution to employment (just under 9% of employment in manufacturing and 2.5% of that in the economy as a whole).

In other Member States, the contribution of the automotive industry to value-added is less. Nevertheless, it still accounts for around 12.5% of value-added in manufacturing in Hungary and Slovakia (some 2.5% of GDP) and 10.5% on Sweden (just over 2% of GDP). In all three of these countries, the share of employment in the industry is less than the share of value-added, most especially in the two new Member States, where the industry is responsible for only around 6-7% of total manufacturing employment. As in the Czech Republic, this reflects significantly higher productivity in the industry than in the economy as a whole.

In other EU Member States, the industry accounts for less than 1.5% of the total value-added generated by the economy – for just under this in Austria and for just over 1% in Belgium, Spain, France, Poland and Slovenia. In Romania, it accounts for 1% of the total and in the UK for just under, while in Italy, the Netherlands and Portugal, the figure is only around 0.5%. In other Member States, the figure is less.

3 Employment in the automotive industry relative to manufacturing, 1995, 2000, 2006



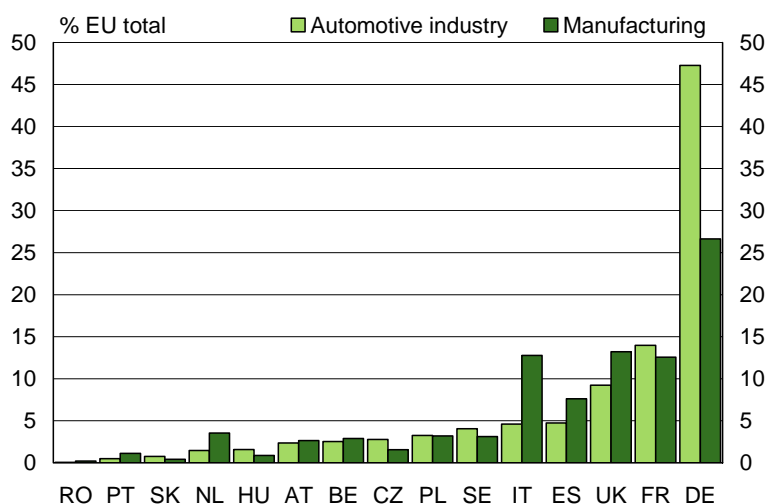
Division of value-added and employment in the automotive industry between EU Member States

As implied by the figures quoted above, Germany accounts for a substantial share of the total value-added generated by the automotive industry in the EU. Enterprises located there are responsible for around 47% of the total generated in the EU, considerably more than the German share of EU manufacturing as a whole (27%) (Figure 4). The next largest share (14%) is produced by France – slightly more than the French share of total value-added in manufacturing, in the EU – while the UK is the third largest producer in these terms, accounting for some 9% of the EU total, much less than the UK share of value-added in manufacturing. These three countries together, therefore, are responsible for around 70% of automotive industry output.

The fourth and fifth largest producers are Spain and Italy, each accounting for just under 5% of industry value-added, with Sweden the sixth largest, accounting for 4%, in this case, unlike the other two countries, more than the Swedish share of manufacturing value-added in the EU. Elsewhere, only Poland accounts for more than 3% of EU value-added in the industry, though the Czech Republic is responsible for just under 3%, more than either Belgium or Austria.

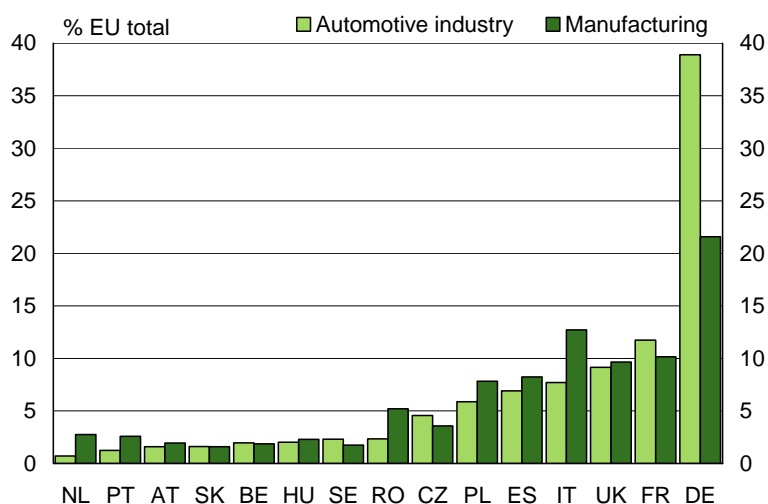
Although the new Member States have become increasingly important in the industry, together they are still responsible for under 10% of value-added in the automotive industry in the EU. This, however, is still more than their share of value-added in EU manufacturing as a whole. While therefore, the new Member States might have much lower levels of GDP and income than the EU15 countries and be lagging in terms of economic development, it is, nevertheless, the case that they – and in particular, the Czech Republic, Hungary and Slovakia – are relatively specialised in a medium-to-high tech industry like the automotive one, which is true only of Germany and Sweden in the EU15.

4 Division of value-added of automotive industry and manufacturing in the EU between Member States, 2006



The division of employment in the automotive industry follows a similar pattern, though the German and French shares of the total jobs in the industry in the EU (39% and 12%, respectively, in 2006) was less than their share of value-added reflecting their higher levels of productivity than the EU average (see below) (Figure 5). The UK share of jobs (9%) was only slightly less than its share of value-added, while by contrast, the Spanish and, more especially, the Italian share of jobs was larger than their share of value-added. This reflects the) relatively low level of productivity in Italy.

5 Division of Employment in automotive industry and in manufacturing in the EU between Member States, 2006

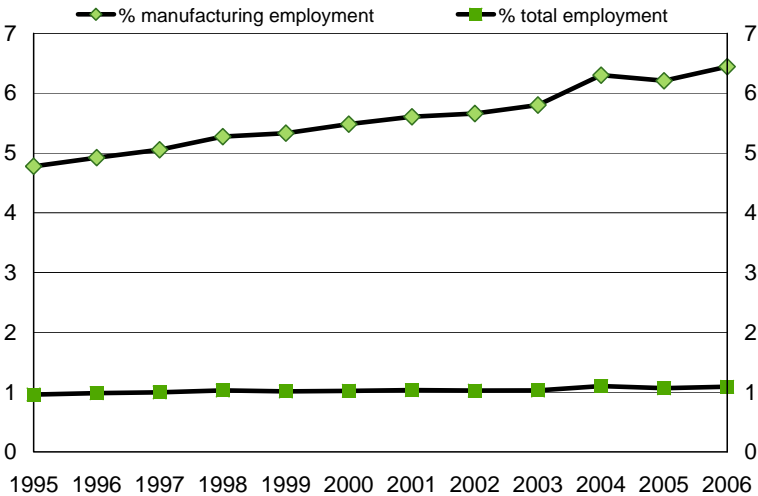


Relatively low productivity as compared with other EU countries is even more apparent in the new Member States, both the Czech Republic and Poland accounting for over 4% of total employment in the automotive industry in the EU, double their share of value-added.

Growth of employment in the automotive industry

The number employed in the automotive industry has tended increase over time, especially in relation to employment in manufacturing. In 1995, therefore, the industry accounted for just over 4.5% of total employment in manufacturing in the EU, defining this to cover the present 27 Member States (Figure 6). By 2000, this figure had risen to 5.5% and by 2006 to round 6.5%.

6 Employment in the automotive industry in the EU relative to manufacturing employment, 1995-2006



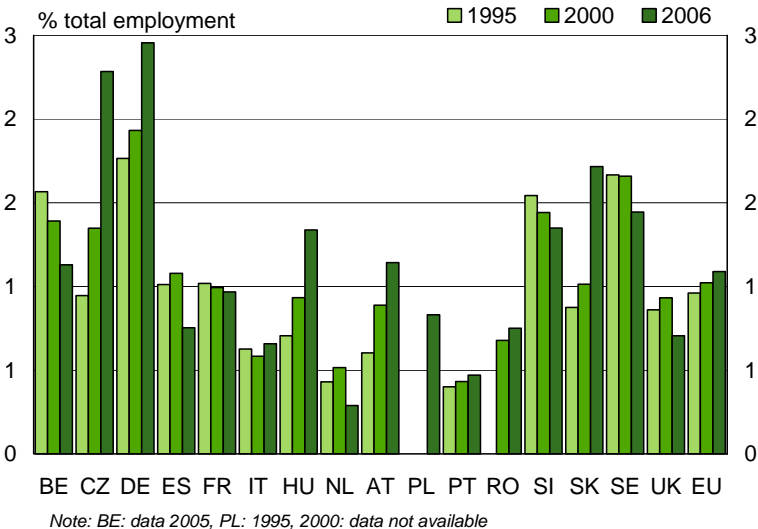
Perhaps unexpectedly given job losses in many manufacturing industries over this period, employment in the automotive industry has also grown in relation to employment in the economy as a whole over the past decade, if only slightly. In 1995, it accounted for 1% of the total number employed in the economy, in 2006, it was responsible for 1.1%. Since, however, the total number in work in the economy increased over this period – by almost 1% a year on average – employment in the automotive industry also rose at a similar, and slightly higher, rate.

This pattern of growth is repeated in most Member States in which the industry is important, though more in relation to employment in manufacturing than in relation to that in the economy as a whole. Growth in employment has been particularly high in Germany and the new Member States since 1995. Between 1995 and 2006, therefore, the number employed in Germany increased from 8% of employment in manufacturing to almost 13% in 2006, with a higher growth rate in the second part of the period after 2000 than the first (Figure 3). In the Czech Republic, Hungary and Slovakia, growth was equally marked in the second part of the period, employment in the industry relative to that in manufacturing increasing by 2-3 percentage points in each case. Although there was also significant growth in Austria, elsewhere employment either went up much more slowly or declined in relative terms.

Employment in the automotive industry, therefore, fell as a share of that in manufacturing between 1995 and 2006 in Belgium, Spain and the Netherlands, especially after 2000, remained broadly unchanged in Sweden and rose only a little in Italy.

The fall in employment was more marked in the former three countries in relation to employment in the economy as a whole given the decline in employment in manufacturing. The reduction was particularly large in Belgium, though there were also reductions in these terms in France, Sweden and the UK (Figure 7). By contrast, employment in the industry increased considerably as a share of total employment in the economy in Germany, the Czech Republic, Hungary and Slovakia, as well as in Austria.

7 Employment in the automotive industry relative to total employment, 1995, 2000, 2006



While value-added figures for the industry across the EU are available only for a relatively short period, they suggest that this increase was associated with an expansion of value-added in the industry relative to that in manufacturing in all of these countries, though also in Sweden, reflecting a relative increase in productivity.

Changes in the division of employment in the automotive industry between EU Member States

As indicated above, some 39% of the total employed in the automotive industry in the EU work in Germany, substantially more than the German share of total manufacturing employment in the EU (23%) and over twice as large as the German share of total employment (19%).

While the German share of manufacturing employment in the EU (defined as the 27 present Member States) has remained broadly unchanged over the past decade and the share of total employment has fallen, the German share of employment in the automotive industry has increased, especially since 2000. In 2006, the share was over 5 percentage points larger than in 1995 (Table 1, which excludes Poland because of the absence of data before 2004 and

which therefore shows a slightly different set of figures for 2006 than Figure 5 in which Poland is included).

Table 1 Division of employment in the automotive industry in the EU by country, 1995-2006

	<i>as a % of EU excluding Poland</i>											
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
BE	3.0	3.1	3.0	2.7	2.4	2.5	2.2	2.1	2.0	2.0	2.1	2.1
CZ	2.4	2.5	2.6	3.0	2.7	3.1	2.9	3.3	3.4	3.8	3.9	4.9
DE	35.8	35.9	34.9	36.4	36.5	35.4	36.5	38.3	38.4	39.5	39.6	41.3
ES	8.4	8.0	8.4	8.1	8.6	9.3	9.6	9.3	10.1	9.4	8.5	7.3
FR	14.0	13.8	14.2	13.3	13.9	13.4	14.4	14.0	14.2	12.8	14.0	12.5
IT	8.8	8.1	8.4	8.4	7.6	7.4	7.2	7.0	6.7	8.9	8.7	8.2
HU	1.3	1.3	1.5	1.7	1.8	1.6	1.9	2.1	2.0	1.7	1.9	2.2
NL	1.1	1.3	1.4	1.2	1.3	1.3	1.2	1.2	1.2	0.9	0.9	0.8
AT	1.1	1.0	1.1	1.0	1.3	1.4	1.2	1.2	1.2	1.4	1.4	1.7
PT	1.3	1.4	1.4	1.7	1.7	1.3	1.2	1.3	1.3	1.4	1.5	1.3
RO	3.1	3.2	3.4	3.0	2.9	2.8	2.9	2.9	2.6	2.7	2.5	2.5
SI	0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.2	0.4	0.4
SK	0.8	0.8	0.9	0.9	0.7	1.0	1.0	1.1	1.3	1.3	1.6	1.7
SE	3.6	3.6	3.4	3.2	3.1	3.2	3.2	3.0	3.0	2.9	2.7	2.4
UK	13.5	14.4	14.1	13.8	14.1	14.5	12.9	11.6	11.4	10.1	9.4	9.7

The French share of EU employment in the automotive industry, the second largest, though under a third the size of the German share, remained much the same between 1995 and 2003 but has declined since then (by almost 2 percentage points). The UK share shows a similar pattern, falling by over 3 percentage points between 2001 and 2006, while the Spanish share also fell over this period, in this case by over 2 percentage points having risen over the 1990s.

Apart from Germany, the main countries to show increases in their share of EU employment in the industry over recent years, as implied above, have been the new Member States, especially the Czech Republic (up by 2 percentage points) and Poland (though data on employment are available only from 2004 for the latter).

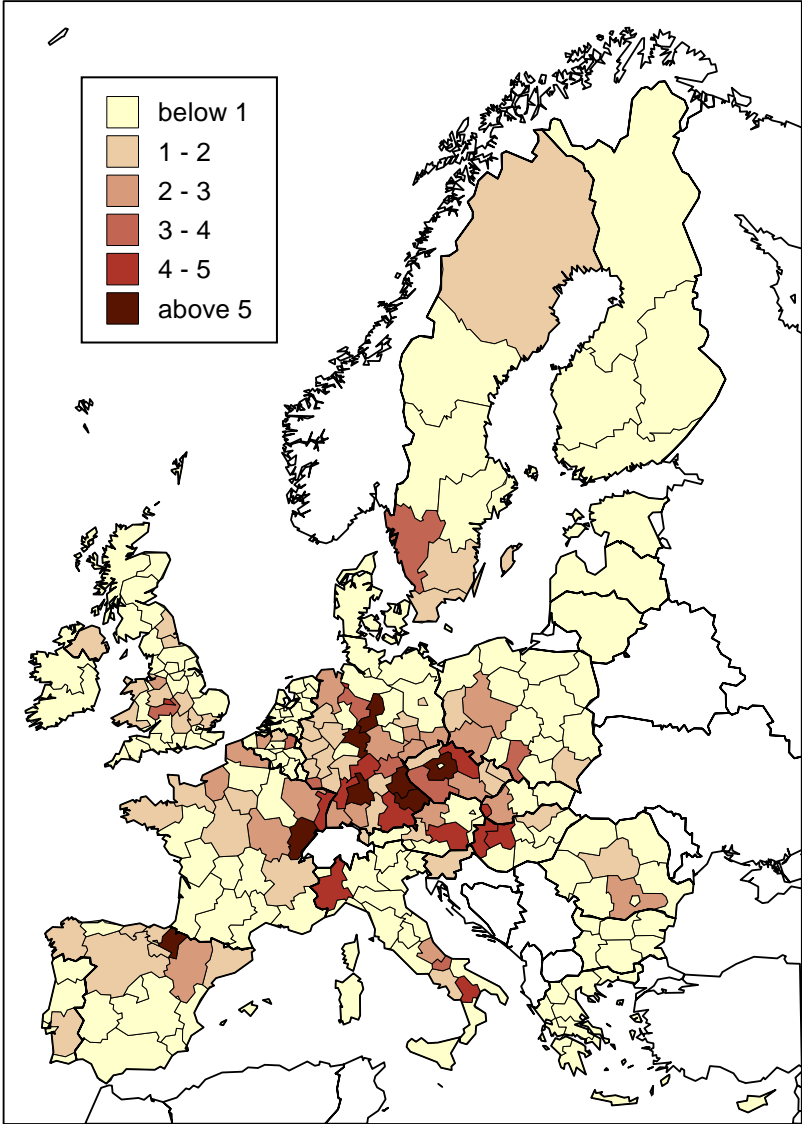
These figures, therefore, indicate a shift in the location of employment in the automotive industry in the EU over recent years, most especially from the EU15 countries, excluding Germany, to a few of the new Member States. Since however, other data indicate that German automotive producers have been foremost in expanding production in the new Member States, the implication is that while this has undoubtedly occurred it does not seem to have been at the expense of jobs in the industry in Germany, which far from contracting have expanded over this period.

Regional location of the automotive industry

Not only is the automotive industry concentrated in a few Member States in the EU but it is also concentrated in a few regions within the countries concerned. These regions tend to be relatively close to each in the centre of Europe (Map). There is, therefore, a concentration in southern Germany, in Stuttgart (where the number employed in the industry is the largest in Europe and where the industry accounts for 11% of jobs), Niederbayern (just over 7%) and Oberplatz (just over 6%). At the same time, the largest share of employment in the industry is Braunschweig in the north of Germany, where it accounts for almost 13% of all jobs in the region, while the share is also relatively large (7%) in Kassel, slightly further to the south.

Map: Employment in the automotive industry (NACE 34) by region, 2006

% total employment in each region



Outside of Germany, in the neighbouring Czech Republic, the share of employment in the industry is largest in Stredni Cechy, the region surrounding Prague, where it is responsible for almost 8% of total jobs. Elsewhere, the industry accounts for over 5% of employment only in two other regions – Franche-Comté in the Eastern part of France (5.5%) and Navarra in the north of Spain (marginally over 5%). In France, the share of the industry is also relatively large in Alsace, on the German border, where it amounts to over 4%. This is equally the case in Piemonte in northern Italy and Basilicata in the south, as well as in Kozep-Dunantul and Nyugat-Dunantul in the western part of Hungary, in Styria in Austria, in the Bratislava region of Slovakia and in the West Midlands of the UK.

In addition, in Germany, there are another four regions where the share of employment in the automotive industry exceeds 4%, three in the south (Oberbayern, Karlsruhe and Unterfranken) and one in the north (Bremen) and in the Czech Republic, another one (Severovychod to the east of Prague).

Change in share of regional employment in the automotive industry

The change in the relative number employed in the automotive industry at the regional level over recent years has broadly been in line with the national experience. In Germany, therefore, most of the regions in which the share of employment in the industry is highest experienced an increase in the share between 1995 and 2006, most especially over the latter part of the period. This was particularly the case in Stuttgart, Braunschweig and Oberplatz, in each of which the share increased by over 3 percentage points. It is also the case in the Czech Republic, where the relative number employed in the industry in the two main regions went up by around 2 percentage points, while in Kozep-Dunantul in Hungary, Styria in Austria and Bratislava in Slovakia, it rose by just under 2 percentage points.

On the other hand, in Franche-Comté in France, the share of employment in the industry went down by over 3 percentage points between 2000 and 2006 and in Navarra in Spain by almost 1 percentage point. In Piemonte in Italy, it also declined by 1 percentage point over this period, while in Basilicata, it fell by around 2 percentage points between 2002 and 2006 and in the West Midlands in the UK by a similar amount over a slightly longer period.

As shown below, however, neither the growth in the share of employment in the industry nor the decline necessarily implies that the industry has become more or less regionally concentrated over recent years. Whether this is the case or not depends on the overall growth or decline in employment in the regions concerned, as well as on developments in other regions.

Regional concentration of the automotive industry

The data presented above the share of the automotive industry in total employment has implications for the regional concentration of the industry. Nevertheless, it is not possible to draw conclusions about the extent to which the industry is concentrated in a few regions from the weight of the industry in regional employment, particularly as regions vary significantly in size across both Member States and the EU. The importance of a region for the industry can, therefore, differ from the importance of the industry for a region. This is demonstrated below.

The extent to which the automotive industry is concentrated in a few locations in each country varies across the EU. In general, as might be expected, the degree of concentration tends to vary with the size of the country, with employment in the industry being much more dispersed across regions in Germany than in smaller countries. The degree of regional dispersion, however, is higher in Germany and the UK than in France and higher in all three than in Italy (Table 2, which shows for each country the proportion of those employed in the automotive industry who work in the regions which account for the largest share of employment together with the proportion of total manufacturing employment in the country which they account for to give an indication of both the relative size of regions and their degree of specialisation in automotive manufacture).

Table 2 Regional concentration of employment in the automotive industry, 1995-96 to 2005-06

	% country total			% country total		
	Motor vehicles			Manufacturing		
	1995-96	2000-01	2005-06	1995-96	2000-01	2005-06
BELGIUM	86.2	86.5	81.8	54.5	54.3	54.4
Oost-Vlaanderen	14.1	15.2	25.2	15.4	15.2	15.6
Limburg	33.0	29.4	22.0	10.3	10.0	9.5
Antwerpen	29.7	25.9	21.5	20.7	20.9	22.7
Bruxelles-Capitale	9.5	16.0	13.1	8.0	8.2	6.5
CZECH REPUBLIC	72.1	76.9	77.9	58.0	59.2	59.5
Stredni Cechy	30.6	37.1	30.4	10.9	11.0	11.1
Severovychod	24.5	17.2	21.8	18.4	18.2	18.5
Jihozapad	11.1	11.6	14.3	12.3	13.0	13.3
Jihovychod	5.9	11.0	11.4	16.4	17.0	16.6
GERMANY	48.0	46.8	50.9	26.0	27.0	28.4
Stuttgart	18.6	18.6	20.7	8.0	8.7	9.1
Oberbayern	9.0	8.0	9.0	5.5	5.6	5.7
Braunschweig	9.5	7.9	8.0	2.4	2.3	2.3
Karlsruhe	5.8	5.5	5.6	4.3	4.3	4.7
Niederbayern	3.6	4.0	3.8	1.7	1.9	2.0
Sachsen	1.5	2.8	3.7	4.1	4.2	4.7
SPAIN	63.5	68.0	73.5	47.8	50.8	49.7
Cataluña	30.8	31.7	33.9	24.9	26.5	25.4
Castilla y León	11.2	11.9	11.4	5.3	5.6	5.8
Pais Vasco	6.6	7.4	9.6	8.0	8.4	8.1
Galicia	6.6	7.6	9.3	5.5	5.9	6.4
Aragón	8.3	9.4	9.3	4.1	4.3	4.0
FRANCE	55.8	55.3	54.9	43.7	41.8	40.0
Ile de France	20.1	18.3	19.8	16.7	15.5	13.8
Nord-Pas-De-Calais	9.0	10.3	9.6	6.4	6.8	7.6
Franche-Comté	10.7	11.8	9.5	3.3	3.2	3.4
Alsace	9.0	7.8	8.6	4.5	4.2	4.4
Rhône-Alpes	7.0	7.1	7.4	12.9	12.0	10.7
ITALY	75.0	70.7	68.8	53.1	51.8	51.4
Piemonte	51.5	48.0	35.4	12.1	11.9	10.5
Lombardia	9.3	8.9	18.1	26.8	25.4	25.3
Campania	8.8	8.5	8.3	4.4	4.4	4.8
Emilia-Romagna	5.3	5.3	7.0	9.8	10.1	10.8
HUNGARY	94.4	93.8	83.8	66.0	64.8	65.3
Nyugat-Dunantul	34.3	39.6	36.7	14.5	15.0	15.1
Kozep-Dunantul	34.8	28.5	28.8	14.4	15.4	15.9
Eszak-Magyarország	4.7	8.5	9.3	11.6	11.2	11.0
Kozep-Magyarország	20.6	17.1	9.0	25.5	23.2	23.4

Note: Averages of the years 1995 and 1996, 2000 and 2001 and 2005 and 2006 taken in order to smooth for fluctuation in the LFS data. Figures in bold indicate the total shares of employment in the regions shown.

Source: EU Labour Force Survey

In the UK, therefore, the top 8 regions account for a slightly smaller share of employment than the top 5 in France and much the same proportion as the top two regions in Italy. In Italy, the region in which the automotive industry is responsible for the largest share of employment, Basilicata, because of its small size, does not even figure among the four regions which account for the largest share of national employment in the industry. The same is true of Navarra in Spain. In the latter, therefore, a third of employment in the industry is located in Catalonia, which also accounts for a quarter of employment in manufacturing. Similarly in France, automotive producers in Ile de France employ 20% of the work force in the industry more because of the size of the region than its specialisation in automotive manufacture.

Table 2 (Cont) Regional concentration of employment in the automotive industry, 1995-96 to 2005-06

	<i>% country total</i>					
	Motor vehicles			Manufacturing		
	1995-96	2000-01	2005-06	1995-96	2000-01	2005-06
NETHERLANDS	68.0	76.4	76.0	54.1	54.9	54.4
Noord-Brabant	26.5	31.5	39.8	19.7	21.0	21.3
Overijssel	10.7	10.4	14.2	9.1	8.4	8.8
Limburg	18.4	23.5	13.1	9.5	10.1	9.3
Zuid-Holland	12.4	11.1	9.0	15.8	15.5	15.0
AUSTRIA	84.3	78.9	85.7	71.0	70.6	70.7
Steiermark	24.7	28.1	43.9	14.3	15.3	16.9
Oberösterreich	31.8	27.7	23.4	23.0	22.2	23.1
Wien	20.3	16.8	9.4	17.4	17.0	14.2
Niederösterreich	7.4	6.3	8.9	16.3	16.2	16.4
POLAND			72.1			43.7
Slaskie			29.9			13.1
Wielkopolskie			17.9			11.7
Dolnoslaskie			16.0			7.6
Mazowieckie			8.2			11.2
PORTUGAL	95.9	87.1	87.3	94.7	92.9	92.3
Centro (P)	18.2	22.7	31.8	18.7	25.2	25.8
Norte	33.3	27.5	29.6	50.6	49.8	50.0
Lisboa	44.4	36.9	26.0	25.4	17.9	16.4
ROMANIA		87.8	91.4		54.4	53.4
Sud - Muntenia		35.7	55.1		15.9	15.3
Centru		31.4	17.3		16.8	16.6
Sud-Vest Oltenia		17.1	11.3		7.3	7.4
Nord-Vest		3.5	7.6		14.4	14.1
SLOVAKIA	84.6	91.7	84.6	47.6	48.7	52.0
Bratislavsky kraj	33.8	49.9	47.3	10.2	11.3	11.9
Zapadne Slovensko	50.7	41.8	37.3	37.4	37.4	40.1
SWEDEN	76.9		81.2	60.8		63.8
Västsverige	48.7		48.3	22.3		23.4
Småland med öarna	9.7		12.9	13.6		14.2
Sydsverige	9.8		10.0	12.8		13.9
Stockholm	8.7		10.0	12.0		12.3
UK	50.0	50.5	53.4	30.6	29.7	28.9
West Midlands	23.3	20.8	18.1	7.1	6.5	5.6
Hereford, Worcs, Warks	5.7	6.4	7.3	2.3	2.7	2.8
Berks, Bucks, Oxford	3.9	4.4	5.0	3.9	4.0	3.9
Shropshire, Staffs	2.9	3.5	4.9	3.5	3.4	3.2
Cheshire	2.9	3.3	4.8	2.3	2.2	2.4
Leics, Rutland, Northants	2.9	4.0	4.5	4.2	3.9	3.8
Glos, Wilts, North Somerset	4.8	4.2	4.5	4.0	4.1	4.3
West Wales, The Valleys	3.6	3.8	4.3	3.5	2.9	2.9

Note: Averages of the years 1995 and 1996, 2000 and 2001 and 2005 and 2006 taken in order to smooth for fluctuation in the LFS data. Figures in bold indicate the total shares of employment in the regions shown.

Source: EU Labour Force Survey

By contrast, Stuttgart and Braunschweig in Germany, Stredni Cechy in the Czech Republic, Styria (Steiermark) in Austria, Silesia (Slaskie) in Poland, Sud-Muntenia in Romania, Bratislava in Slovakia and the West Midlands in the UK account for large shares of national employment in the automotive industry primarily because the region specialises in automotive manufacture.

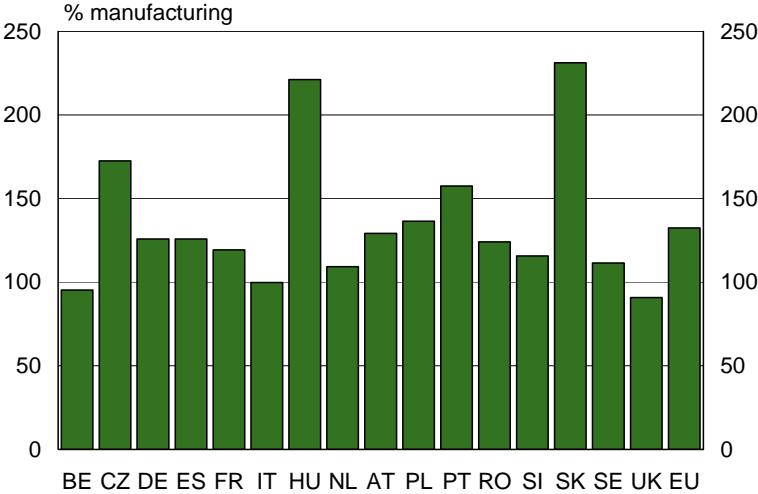
Changes over the past decade or so in the regional concentration of employment in the industry vary across countries. In the Czech Republic, Spain and the Netherlands, employment has become significantly more concentrated in a few regions since the mid-1990s, while in Germany and the UK, it has also become more concentrated but to a smaller extent and in France and Slovakia, it has remained much the same. In the countries in which the industry is most important, therefore, concentration has either increased or remained unchanged.

In the other countries, the industry has tended to become more regionally dispersed. This is particularly the case in Italy, where Piemonte, especially, has experienced a decline in jobs, as well as in Hungary and Portugal, in both of which the capital city region (Közép-Magyarország, where Budapest is situated, and Lisbon) have lost employment in the industry.

Labour productivity in the automotive industry

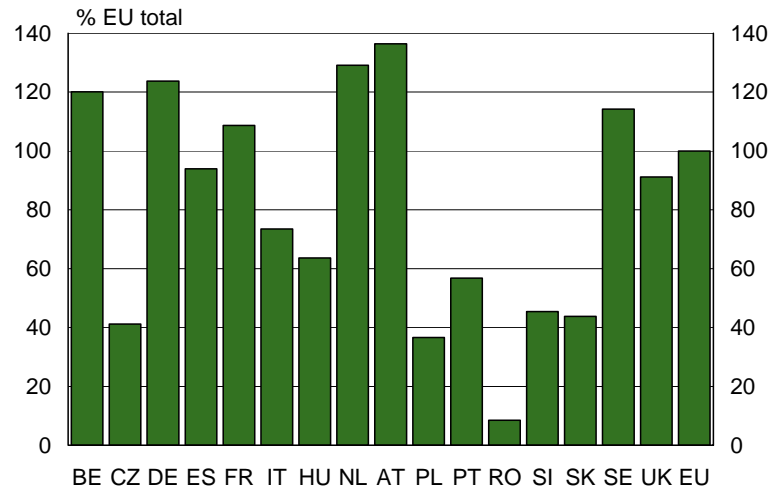
As indicated above, labour productivity in the automotive industry is significantly higher – a round 30% higher – than in manufacturing in the EU as a whole. This is also the case in nearly all Member States, the only exceptions being Italy, where it is much the same and Belgium and the UK, where it is lower (Figure 8). In the Czech Republic, it is around 70% higher than in manufacturing and in Hungary and Slovakia, over twice as higher.

8 Labour productivity in the automotive industry relative to productivity in manufacturing



Nevertheless, because productivity in manufacturing varies markedly across EU countries, it is still the case that productivity in the automotive industry varies equally widely, at least when measured in terms of value-added per person employed (expressed in terms of euros). In Germany, the level of productivity in the industry is over 20% above the EU average, in the Netherlands, around 30% higher and in Austria, 35% higher (Figure 9). By contrast, in Spain, it is around 5% below the EU average, in the UK, some 10% below and in Italy, over 25% below.

9 Labour productivity in the automotive industry relative to EU average



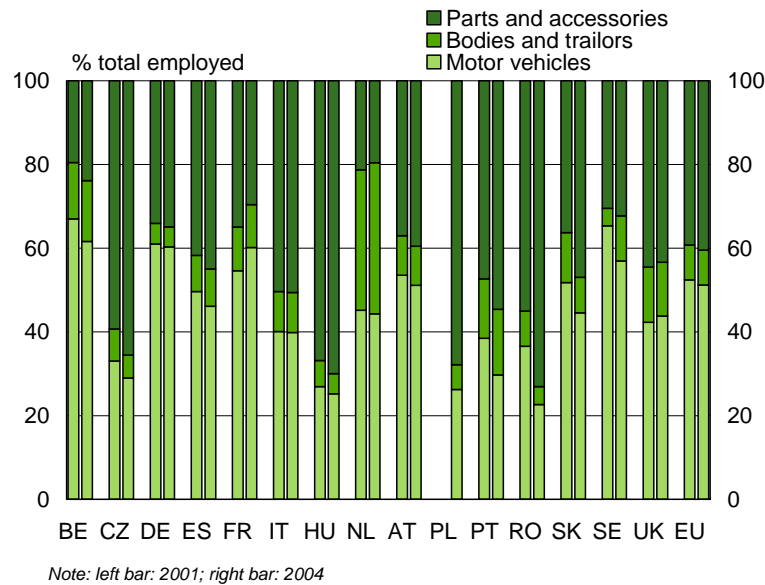
In the new Member States, it is even further below. In Hungary, productivity in the automotive industry is almost 40% less than the EU average, in the Czech Republic, Poland and Slovakia, it is around 60% less (ie less than half the average level)) and in Romania, under than 10% of the average.

These figures have implication for prospective future developments for employment in the industry, in that given the scope for productivity catching up with that in other Member States, let alone in the leading countries, value-added will need to increase substantially in order to maintain employment and even faster to expand the number of jobs.

The division of the industry between sub-sectors

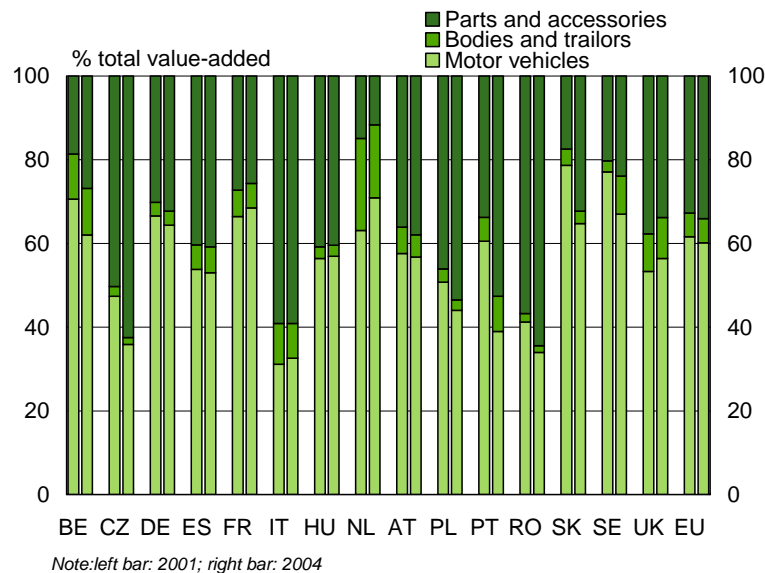
The differences in productivity between countries noted above reflect in some degree variations in the relative importance of different parts of the automotive industry. Whereas most employment is in the manufacture of finished vehicles in Germany, France, Sweden and Belgium – over 60% of the total in each case – in the UK and Italy, where productivity is lower, there is as much or more employment in the production of parts and accessories (over 50% of the total in Italy) (Figure 10).

10 Division of employment in the automotive industry by broad sub-sector, 2001 and 2004



This is even more the case in the new Member States, though to a lesser extent in Slovakia. In the Czech Republic, Hungary and Poland, two-thirds or more of employment is in the production of parts and accessories, and in Romania, almost three-quarters, and under 30% in the manufacture of finished vehicles.

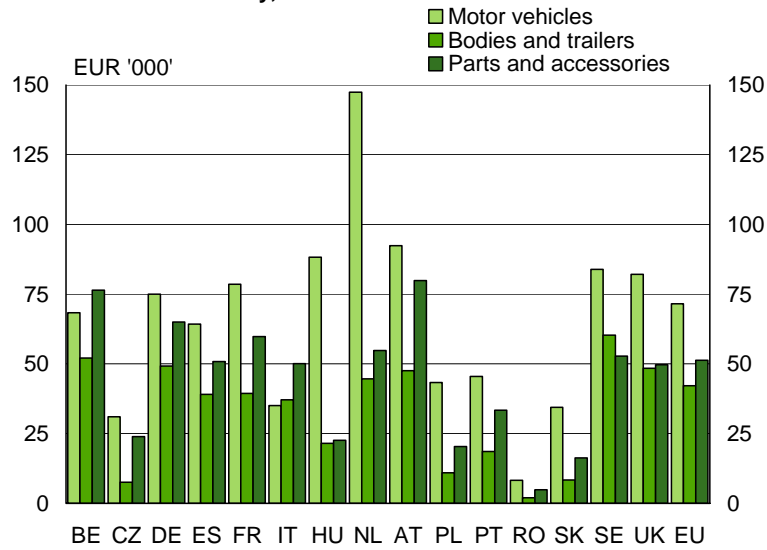
11 Division of value-added in the automotive industry by broad sub-sector, 2001 and 2004



The value-added produced by the work force in finished vehicles, however, is still much more in Hungary and Slovakia than in parts and accessories (Figure 11). This is also the case in the UK, though not in Italy. In the EU as a whole, therefore, value-added per person employed (expressed in euros) is some 40% higher in the manufacture of finished vehicles than in that of parts of components. In Slovakia, however, it is over twice as high and in Hungary, almost

4 times as higher. By contrast, in Italy, productivity in finished vehicles is 30% lower than in parts and accessories and less than the level in Poland (Figure 12).

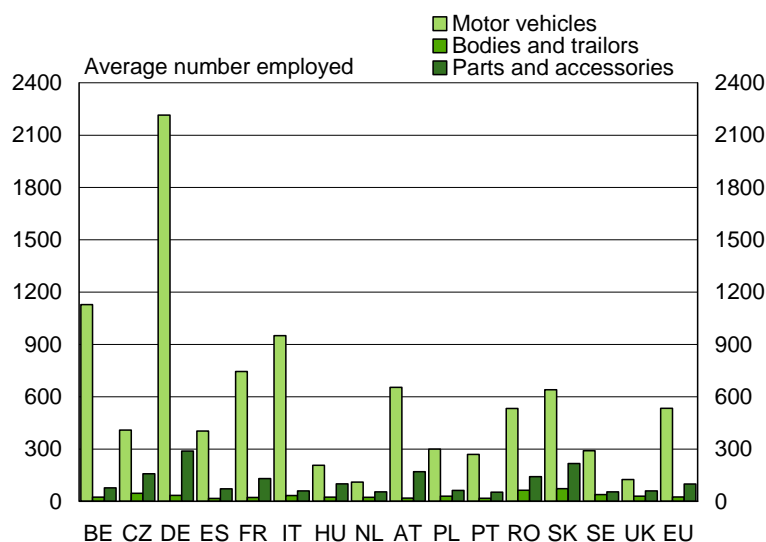
12 Value-added per person employed in sub-sectors of the automotive industry, 2004



Company size

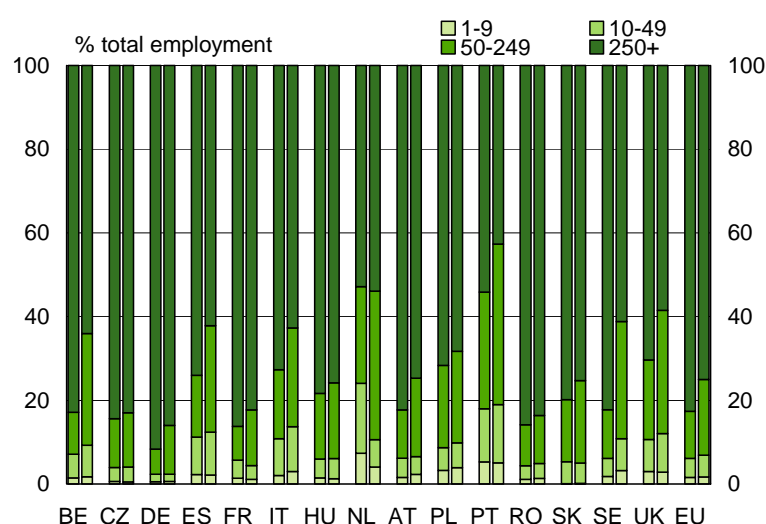
Most companies operating in the automotive industry are relatively small – which is the case in almost all industries – but most people employed in the industry work in large enterprises of 250 or more people employed. This is particularly the case in the finished vehicle sector where the average enterprise has around 530 employees in the EU and 2,200 in Germany, where companies are much bigger than elsewhere (Figure 13). In the parts and accessories sector, the average firm size is just under 100, though almost 290 in Germany, while in the production of bodies and trailers, it is only around 25.

13 Average size of enterprise in sub-sectors of the automotive industry, 2004



Accordingly, almost 83% of those employed in the automotive industry work in firms with 250 or more employees (conventionally defined as large in the EU), 11% in medium-sized firms of 50-249 employees and only 6% in small firms with under 50 people employed (Figure 14). In the parts and accessories sector of the industry, more people are employed in small and medium-sized firms, but it is still the case that 75% of the workforce are employed in large firms.

14 Employment by size of enterprise in the automotive industry, 2004



Note: left bar: total; right bar: parts and accessories

These figures vary between countries. In Germany, 92% of employment in the automotive is in large enterprises and 86% of that in parts and accessories. In France, the figures are only slightly smaller as they are in Czech Republic and Romania, in each of which around 85% of

employment is in large firms. Though the relative importance of large companies is less elsewhere, it is still the case that over 70% of the workforce in the industry as a whole are employed in such enterprises in all countries apart from the Netherlands and Portugal, in both of which the figure is just over 50%.

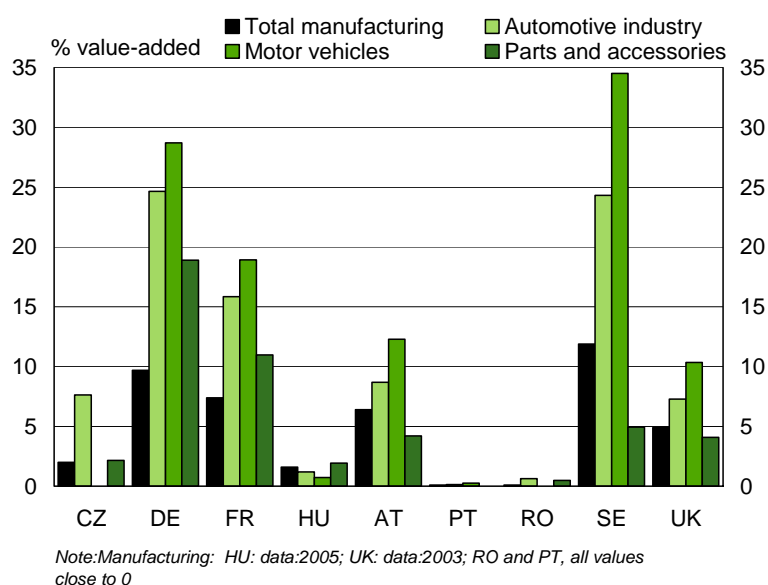
Virtually throughout the EU and in most parts of the industry, large enterprises, therefore, are predominant.

R&D expenditure

Innovation is vital in the automotive industry to maintain profitability and market share. The amount of R&D carried out in enterprises, however, varies markedly across countries, in part reflecting the underlying strength of companies in the industry and in part the location of research activities, which tends to be close to a company's headquarters, or at least in the same country.

In Germany, R&D expenditure in the industry as a whole amounted to some 25% of value-added in 2004, slightly above the level in Sweden but significantly more than in France (16%) and substantially higher than in Austria, the UK or the Czech Republic (7-9% in each case) (Figure 15). In the three other countries for which data are available – Hungary, Portugal and Romania – R&D was barely carried out at all.

15 R&D expenditure in the automotive industry, 2004



In all these countries except the latter three, R&D spending in the automotive industry was much higher relative to value-added than in manufacturing as whole – around 2.5 times higher in Germany and over twice as higher in France and Sweden, reflecting both the high importance of spending on this activity and the scope for innovation.

The scale of R&D also varies considerably between the different sub-sectors of the industry. In nearly all countries, it is much larger in finished vehicles than in parts and accessories and still more than in bodies and trailers, largely reflecting the scope for innovation in these areas of production. Nevertheless, it is still the case that significantly more R&D is carried out in

parts and accessories in Germany than in other countries – over 70% more relative to value-added than in France and over three times more than in Sweden, the UK or Austria.

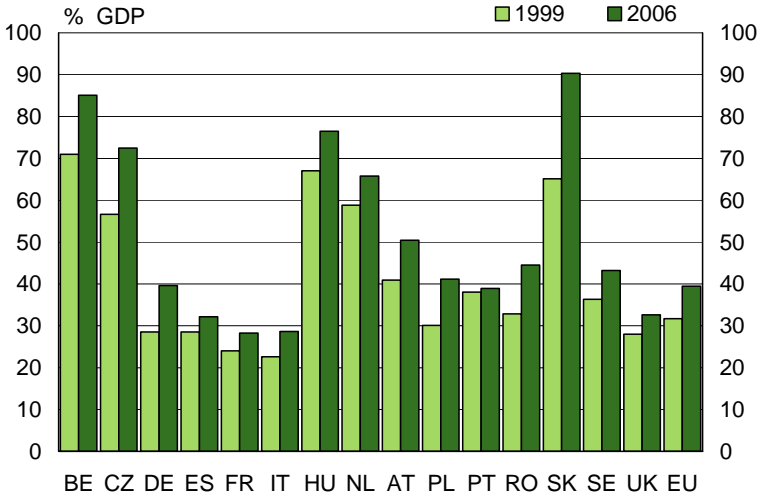
The contribution of the automotive industry to EU exports

Neither the value-added nor the employment figures give an adequate indication of the importance of the automotive industry for the economy and the jobs which are dependent on its output. The trade figures indicate the contribution of the industry to EU export earnings which are vital for sustaining income and supporting employment across the Union.

Background –trade in relation to GDP

Trade with other countries tends to expand more than in proportion to GDP as economic growth takes place. In the EU, this tendency is reinforced by the closer linkages between Member States as the process of economic integration continues. Trade with countries outside the EU, however, has also tended to increase in importance in recent years, as barriers to trade have been dismantled and global markets have become more open. In overall terms, therefore, exports of goods and services of EU Member States increased over the 7 years 1999 to 2006 from just under 32% of GDP, on average, to just over 39% (Figure 16). A large part of the demand for the output of Member States is accordingly external.

16 Exports of goods and services, 2006

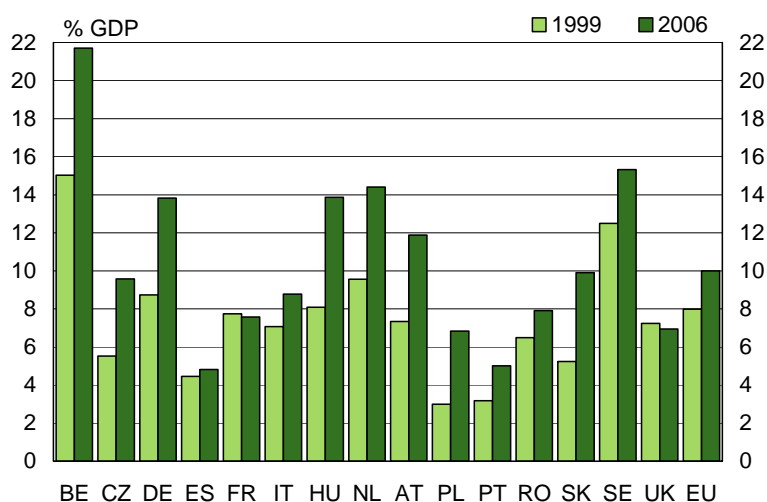


In all Member States, exports are an important part of the overall demand for the goods and services produced, the more so in the smaller countries and most especially in the new Member States. The value of exports in 2006, therefore, amounted to around 90% of GDP in Estonia, Malta and Slovakia – and considerably more than this in Luxembourg –over 80% in Belgium and Bulgaria and 70% or more in the Czech Republic, Hungary and Slovenia. At the same time, even in the larger countries, it was over 30% of GDP in all except France and Italy (just under 30%), and around 40% in Germany². In all Member States, exports increased relative to GDP between 1999 and 2006, in most cases, significantly.

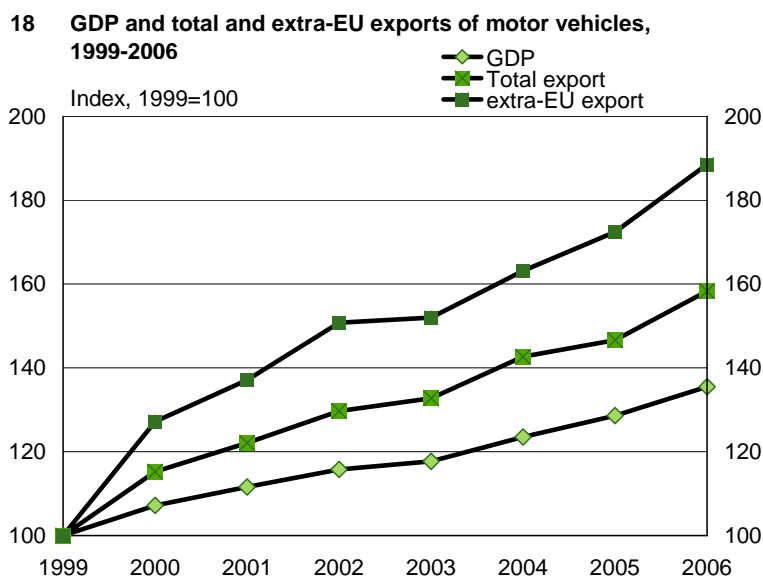
² Since exports are measured in gross terms to include any imports involved in their production and GDP is measured in net terms to exclude these, exports can quite easily exceed 100% of GDP.

Although by far the larger part of Member State exports are to other EU countries, around 30% of the total are to countries outside the EU. Moreover, exports to such countries have grown over recent years at much the same pace as those to countries within the EU. As noted below, most of this trade, as in the case of trade between Member States – around three-quarters of the total – consists of goods rather than services. Exports of goods from the EU to the rest of the world, therefore, amounted to 10% of EU GDP in 2006 and had increased from 8% of GDP in 1999 (Figure 17). As in the case of total exports, this figure tends to be higher in the smaller Member States, though less systematically so – in particular, it is well above average in Germany (14% of GDP) and well below average in Greece and Portugal (3% of GDP and 5%, respectively). Moreover, there is less of a tendency for it to be higher in the new Member States, though there is a widespread tendency in these countries for it to have increased significantly relative to GDP since 1999.

17 Extra-EU exports of goods and services, 2006



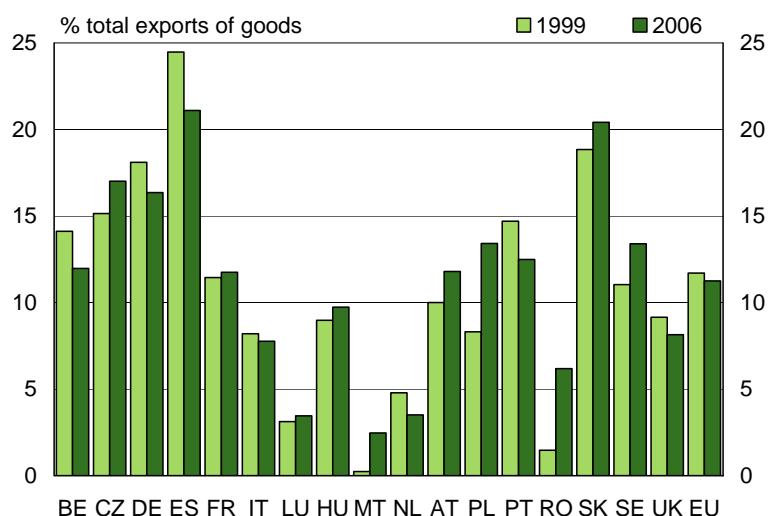
As indicated below, exports of motor vehicles are an important part of the total both in respect of overall trade and in trade with third countries. Although their contribution to total EU exports has declined marginally in recent years, it is still the case that it has risen relative to GDP as well as in relation to the output of the automotive industry. While GDP of the EU27 countries, therefore, increased by 36% in current price terms between 1999 and 2006, the value of exports of motor vehicles went up by 58% and the value of exports to the rest of the world by 89%, some 2½ times the rise in GDP (Figure 18).



Contribution to total exports of Member States

In 2006, motor vehicles and components were responsible for just over 11% of exports of goods of EU Member States (Figure 19), while exports of goods accounted for almost 77% of total exports, including exports of services. Motor vehicles, therefore, contributed around 8.5% of the total export earnings of EU countries, from both internal and external trade (Figure 20). (Although services have come to account for an increasing share of both value-added and employment in the EU economy, as in other developed parts of the world, and are now several times more important than manufacturing in these terms, the same tendency has not been repeated in respect of trade. Goods, and manufacturing in particular, continue to be responsible for much the largest part of trade with very little change over the past 10-20 years. The same is the case in individual Member States, with only the UK among the larger economies showing any significant growth in the share of services in export earnings in recent years.)

19 Exports of motor vehicles as a share of total exports of goods, 1999 and 2006

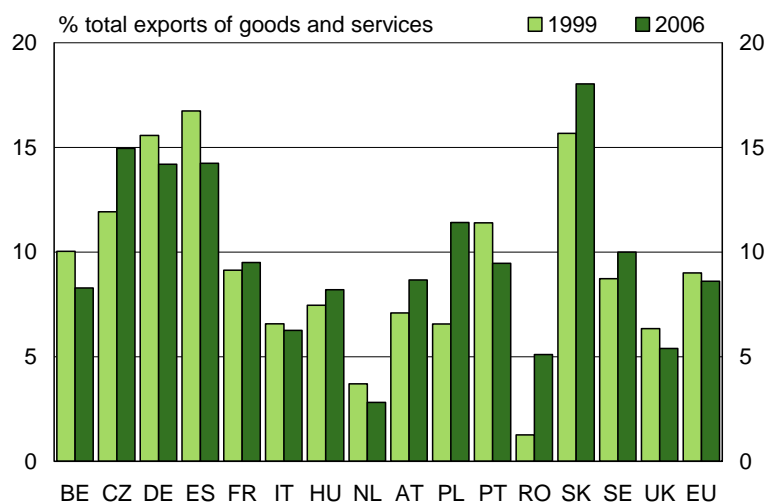


The importance of motor vehicles as a source of export earnings varies between Member States, though they are relatively significant in most of the larger countries. In Slovakia, they accounted for 18% of total exports, (including of services) in 2006, in the Czech Republic, for 15% and in Germany and Spain, for just over 14%. In Poland, Slovenia and Sweden, they made up 10-12% of the total and in France for only slightly less. On the other hand, they accounted for only just over 5% of exports in the UK and only around 3% in the Netherlands.

Moreover, as pointed out below, in a number countries, Spain in particular, motor vehicles account for a significant proportion not only of exports but also of imports and relatively few EU Member States have substantial net export earnings from the automotive industry.

Since 1999, the contribution of motor vehicles to total exports has tended to decline but only slightly. The decline, moreover, has been largely confined to EU-15 countries. In all of the new Member States, except Bulgaria, the share of motor vehicles in total exports increased between 1999 and 2006. This was particularly the case in Poland, Lithuania and Romania, in each of which the share increased by around 4 percentage points or more. In the EU-15, there were also increases in Austria and Sweden and, less unambiguously, in France.

20 Exports of motor vehicles as a share of total exports of goods and services, 1999 and 2006

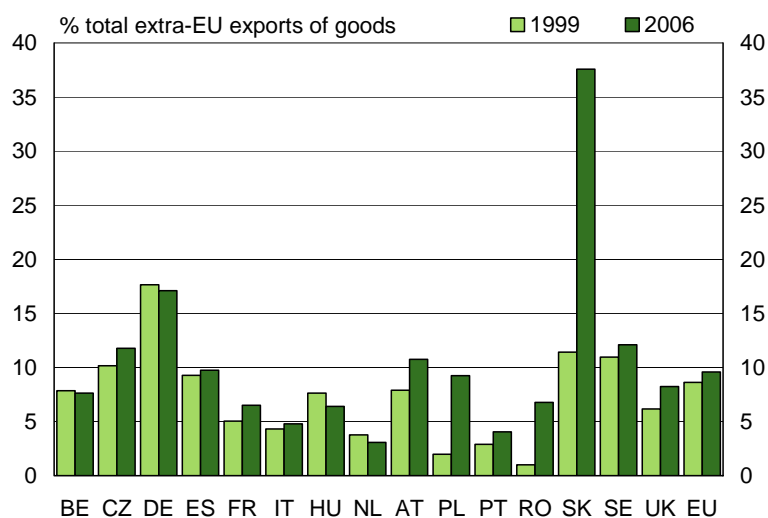


Contribution to extra-EU exports

A large part of exports of motor vehicles and components, as for other manufactures, are to other EU Member States and therefore to other parts of the internal market. In 2006, some 72% of exports were of this type on average, though the figure varies between countries. This figure, however, has tended to decline in recent years (from just over 77% in 1999). In consequence, exports of motor vehicles to countries outside the EU have risen by significantly more than exports to the internal market since 1999 – by almost twice as much more in percentage terms in the 7 years 1999-2006, the value of exports to third countries in terms of Euros rising by around 94% over this period as against an increase in exports to the internal market of 49%. This reflects in part the relatively slow rate of growth of the EU economies over this period, especially in relation to growth in the rest of the world.

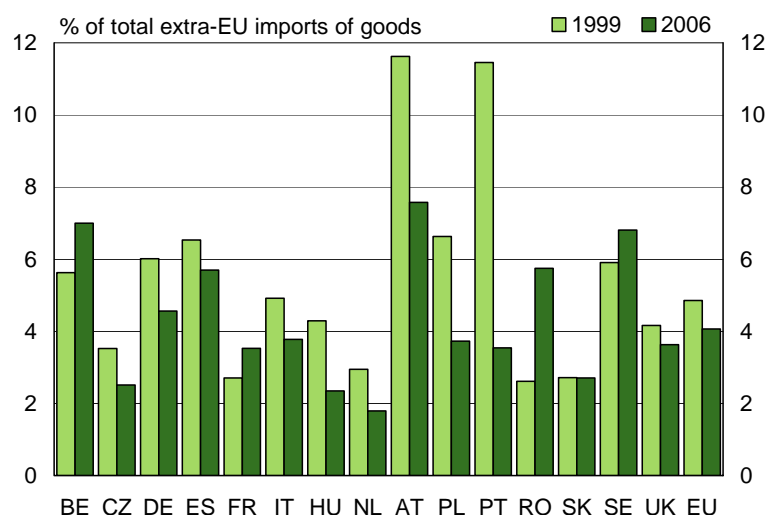
It also reflects, however, the higher rate of growth in external demand for EU motor vehicle exports than other export products. Since 1999, therefore, motor vehicles have become a more important component of EU exports to the rest of world and, accordingly, of EU earnings from trade with other countries, their share of the total increasing from 8.6% to 9.6% between 1999 and 2006 (Figure 21).

21 Exports of motor vehicles as a share of total extra-EU exports of goods, 1999 and 2006



At the same time, although a significant number of motor vehicles are imported into the EU from third countries, they represent a much smaller component of the total than in respect of exports. Moreover, their contribution to EU imports has tended to decline over time. In 2006, therefore, motor vehicles represented just 4% of total imports of goods into the EU, less than half the share of motor vehicles in exports and almost 1 percentage point less than in 1999 (Figure 22).

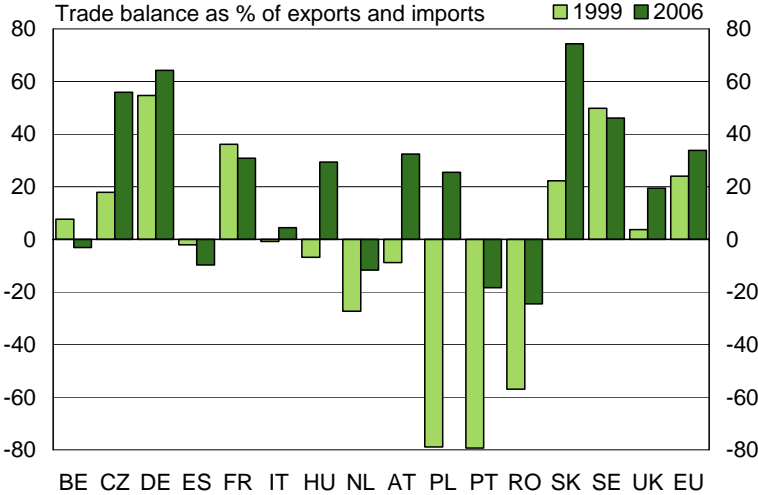
22 Imports of motor vehicles as a share of total extra-EU imports of goods, 1999 and 2006



Accordingly, the EU has a substantial surplus on trade in motor vehicles with the rest of the world, amounting to around a third of total trade in the two directions (ie of exports plus imports) and accounting for a considerable proportion of EU export earnings in net terms

(Figure 23). Indeed, in 2006, the EU surplus on trade in motor vehicles amounted to almost twice the overall surplus on goods and services with the rest of the world and over the 7 years 1999-2006, the average net earnings from trade in motor vehicles were only around 10% less than total net earnings from trade with third countries.

23 Balance of extra-EU trade in motor vehicles, 1999 and 2006

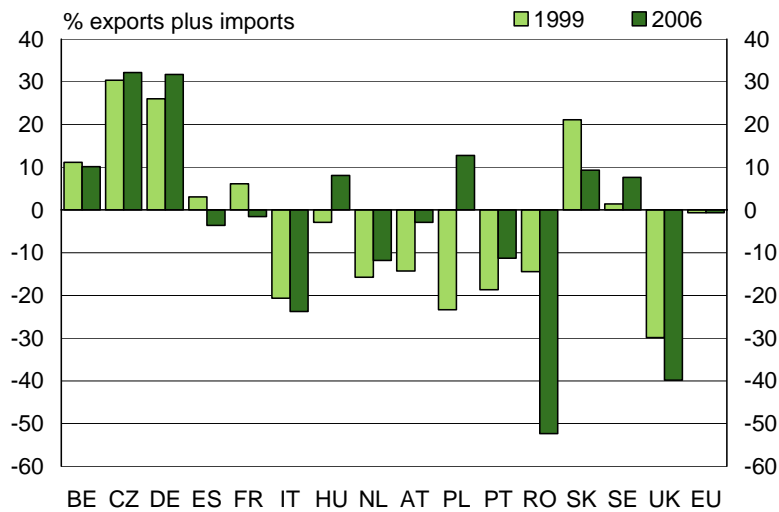


Importance of extra-EU exports in Member States

The scale of exports of motor vehicles to countries outside the EU – ie the relative importance of the external market as compared with the internal one – varies markedly between Member States. In Germany, the UK and Sweden, just under 40% (36-38%) of export demand comes from outside the EU, in Italy and Austria, around a quarter, in France, just under 20% (ie only around half the proportion for Germany) and in Belgium and Spain, 13-15%. (Figure 25) The scale of external export demand is also relatively small in most of the new Member States in which the industry is important. Apart from Slovakia, where the share amounts to around a quarter, exports to third countries account for only 10% of total exports of motor vehicles in the Czech Republic and under 15% in both Hungary and Poland. Almost all of the vehicles and components produced for export in these countries, therefore, go to other parts of the EU, in part reflecting the integrated nature of the industry.

The external demand for motor vehicles is matched in some of these countries by an internal demand for vehicles produced in countries outside the EU. In Belgium and Spain, imports from the third countries exceed exports to them, while in Italy, they are only slightly smaller. In the UK, however, the surplus on trade in motor vehicles with the rest of the world amounts to around 20% of total trade flows (exports plus imports), in France, to around 30%, in Sweden, to just over 45% and in Germany, to almost 65%. In Slovakia, the surplus is even larger, amounting to almost 75% of total trade flows. In the other new Member States where the industry is important, the surplus is smaller but still substantial (around 25% in Poland, 30% in Hungary and 55% in the Czech Republic).

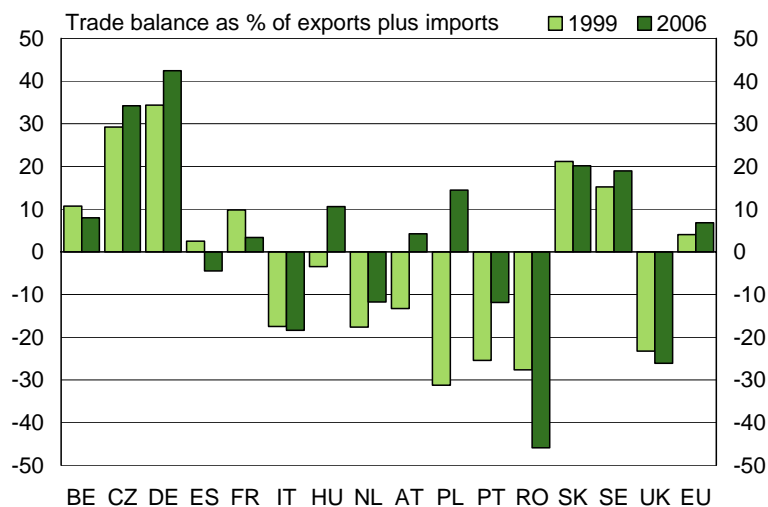
24 Balance of intra-EU trade in motor vehicles, 1999 and 2006



In a number of countries, however, the surplus on external trade in motor vehicles is offset by a deficit on internal trade. Apart from the Czech Republic and Germany (where the surplus amounts to over 30% of internal trade flows), Member States either have a deficit on trade in motor vehicles with the rest of the EU (most of them) or only a small surplus (Figure 24).

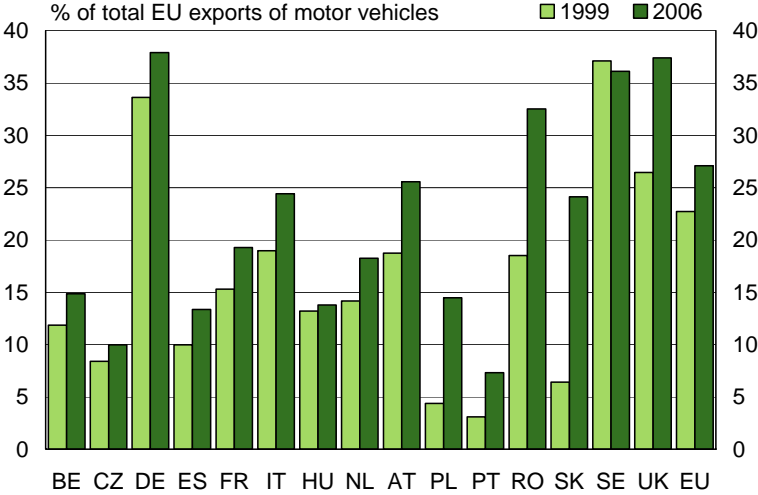
Accordingly, only 10 of the 27 EU Member States have an overall surplus on trade in motor vehicles – 5 EU15 countries: Belgium, Germany, France, Austria and Sweden and 5 new Member States: the Czech Republic, Hungary Poland, Slovenia and Slovakia. Moreover, among these, the surplus is less than 10% of total trade flows in four cases and over 20% of total trade flows only in two countries, the Czech Republic (34%) and Germany (42%) (Figure 26).

25 Balance trade of motor vehicles, 1999 and 2006



The importance of the automotive industry as a source of net export earnings, therefore, varies considerably across the EU. It is a major and growing source in Germany and the Czech Republic as well as in Sweden. Slovakia and Poland, if less so. It is a smaller and declining source in France.

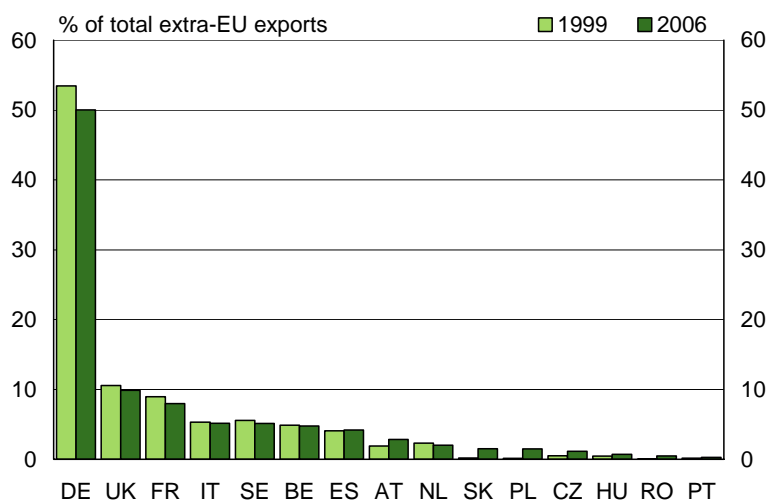
26 Balance of total trade in motor vehicles, 2006



Member State contribution to extra-EU exports

The contribution of Member States to overall exports of motor vehicles by the EU to the rest of the world varies markedly, largely in line with the output of the industry, though the share of production going to third countries also varies across the EU. Germany, therefore, is more dominant in global markets outside the EU than in the internal market, accounting for well over half (55%) of total EU exports of motor vehicles to other countries in 2006, slightly higher than in 1999 and over 5 times higher than the next largest extra-EU exporter, the UK (which accounted for 10%) (Figure 27). Apart from France, whose share declined between 1999 and 2006 from 9% to 8%, no other country was responsible for more than 5% of the total – Italy, Sweden and Belgium accounted for around 5% and Spain for 4%. Although the contribution of the new Member States to exports to third countries increased over this period, it is still the case that in 2006, the Czech Republic, Hungary, Poland and Slovakia together accounted for just 5% of the EU total.

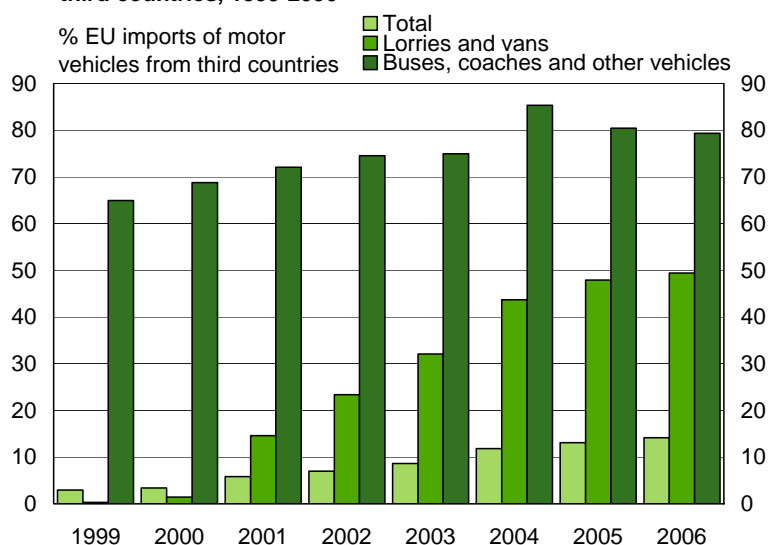
27 Division of extra-EU exports of motor vehicles between Member States, 1999 and 2006



Trends in EU trade with other countries

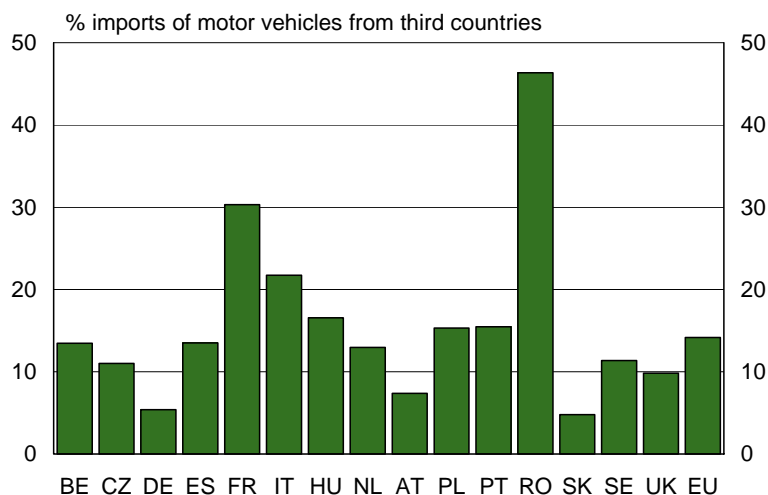
Developments in the trade of EU Member States with third countries gives an indication not only of where the market for exports is growing and the countries from which imports are increasing but also of the extension of the industry into countries neighbouring the EU. This is particularly the case as regards Turkey. In 2006, Turkey accounted for just over 14% of total imports of motor vehicles and components from third countries, only marginally less than the proportion from the US (just under 15%) (Figure 28). This compares with just 3% of the total in 1999. A disproportionate share of these imports consists of lorries and vans and buses and coaches. Turkey, therefore, was responsible in 2006 for almost half of total EU imports of lorries and vans from the rest of the world, as compared with under 1% in 1999, and for 79% of imports of buses, coaches and other vehicles apart from cars and lorries, some 14 percentage points more than 7 years earlier.

28 Imports from Turkey as a share of imports of motor vehicles from third countries, 1999-2006



The scale of imports from Turkey, which reflects the extent of production linkages, varies significantly between Member States. Imports of motor vehicles from Turkey are especially important for France (30% of the total from the rest of the world and 67% of lorries and vans) and Italy (22% of the total, 73% of lorries and vans). In Germany, on the other hand, they accounted for only some 5% of total imports from third countries and 14% of imports of lorries and vans (Figure 29-31).

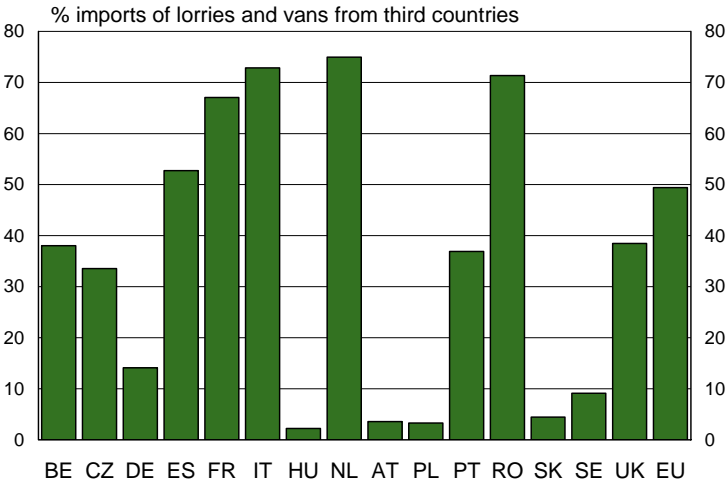
29 Imports from Turkey as a share of the imports of motor vehicles from third countries, 2006



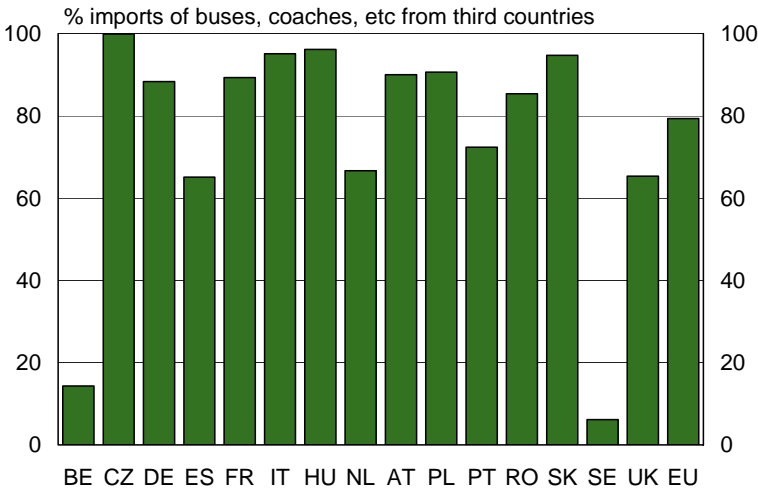
There are also signs of some increase in imports from north African countries, Tunisia and Morocco in particular, as well as from Russia, and as regards components, especially, though the scale remains small (only just over 1% of the total imports of components from third countries in the case of Tunisia and less in the case of Morocco and Russia). The scale of imports from these countries, however, is very uneven across the EU. For France, therefore,

over 8% of imports of components from third countries came from Tunisia in 2006, while almost 3% of Spanish imports of this category came from Morocco.

30 Imports from Turkey as a share of imports of lorries and vans from third countries, 2006



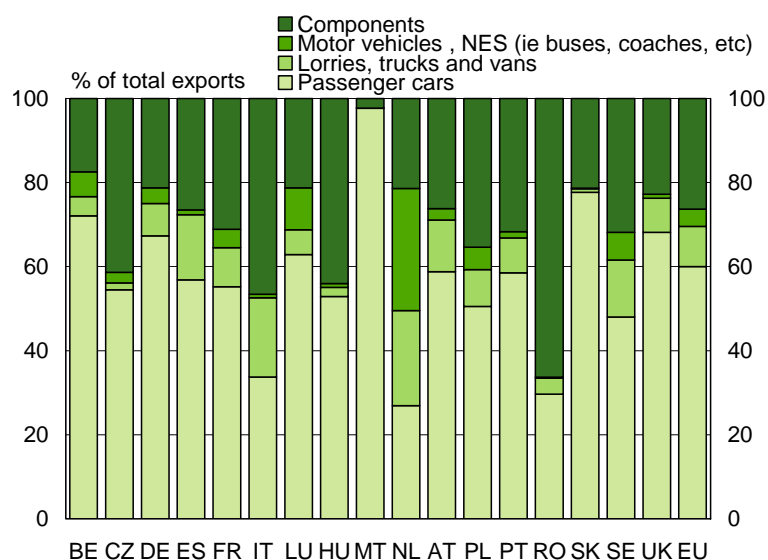
31 Imports from Turkey as a share of imports of buses, coaches and other vehicles from third countries, 2006



Breakdown of motor vehicle exports by broad type

The greater part of exports of motor vehicles by EU countries consist of finished passenger cars which made up 60% of the total value of exports in 2006, down slightly (around 1 percentage points) as compared with 7 years earlier in 1999 (Figure 32). Lorries, trucks and vans made up just 10%, almost 1 percentage point more than in 1999, while other vehicles, such as buses and coaches, accounted for just 4%, again marginally more than in 1999.. Components and parts of various kinds, therefore, accounted for just over a quarter (26%) of the total, marginally less than 7 years earlier.

32 Division of EU exports of motor vehicles by category, 2006



This aggregate breakdown, however, varies between Member States, with finished passenger cars accounting for an above average share of the total in Belgium, Germany, the UK and Slovakia, under half the total in Sweden and only around a third in Italy; lorries and vans making up an average share in Italy, Spain and Sweden, along with buses and coaches in the last, and components making up almost half of total exports in Italy, over 40% in the Czech Republic and Hungary and around 35% in Poland.

The division of imports between broad kinds of product varies even more. Components and parts, therefore, made up more than 60% of total imports of the motor vehicle category in Slovakia in 2006, over 50% in the Czech Republic and around 40% in Poland and Sweden as compared with just under 30% on average in the EU, emphasising the diffused nature of the production process in the industry.

Characteristics of the work force in the automotive industry

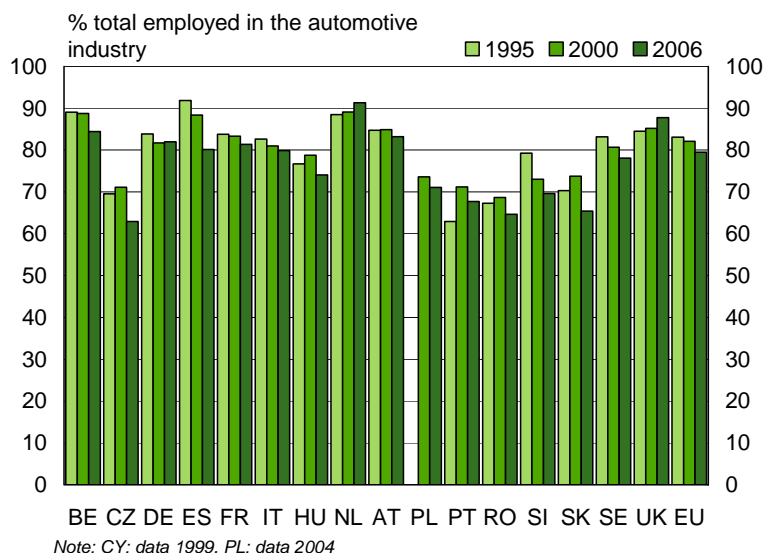
The work force in the automotive industry is predominantly composed of men, many of whom are aged 50 or over, with increasing numbers employed in engineering or other relatively high level jobs and declining numbers in skilled manual jobs. Partly as a consequence, the proportion of the work force who have university degrees or equivalent qualifications is tending to rise over time. These features are examined in more detail below.

Men and women in the workforce

Men account for some 80% of those employed in the automotive industry in the EU, a figure which has declined slightly over the past decade (Figure 33), but which is still 10 percentage points higher than the average for manufacturing. Although, the proportion of men varies between Member States, in all countries in which the industry provides a significant number of jobs, men fill well over 60% of them, and in Belgium, the Netherlands and the UK, 85% or more. Nevertheless, the proportion of men tends to be smaller in the new Member States, the figure being around 70% or less in all of these apart from Hungary and around 65% in the Czech Republic, Romania and Slovakia. Women, therefore, account for over a third of the workforce in these countries.

Moreover, the proportion of women rose in all of the new Member States between 2000 and 2006. This was also the case in many of the EU15 countries, especially in Belgium and Spain, though in both cases, women make up less than 20% of the workforce.

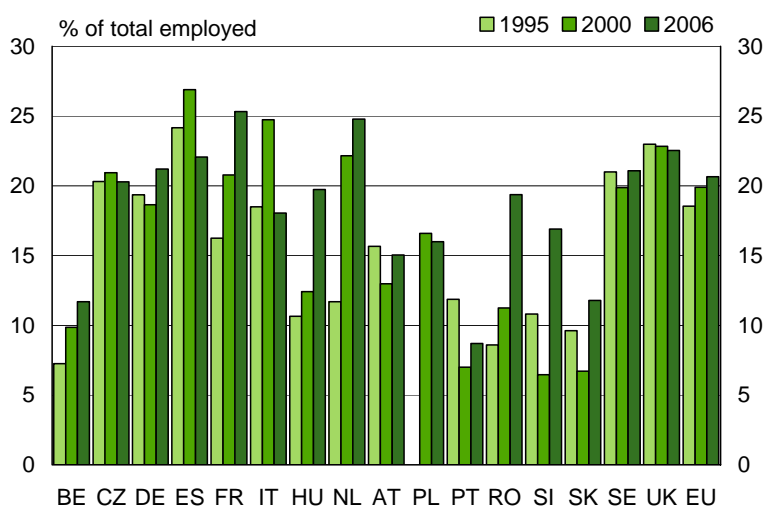
33 Employment of men as a share of total employed in the automotive industry, 1995, 2000, 2006



The ageing of the workforce

Like other parts of manufacturing, the average age of the workforce in the automotive industry is increasing. In 2006, almost 21% of those employed in the industry in the EU were aged 50 or over, slightly less than in manufacturing as a whole (22%) but still some 3 percentage points higher than in 1995 (Figure 34).

34 Employed aged 50 and over as a share of total employed in the automotive industry, 1995, 2000, 2006



The proportion of the workforce in this age group, however, varies markedly across the EU, as does the rate of change. In both France and the Netherlands, therefore, around 25% of those

employed in the automotive industry were 50 or over, in both cases substantially more than in 1995. Equally, in both Spain and the UK and to a lesser extent in Germany and Sweden, the proportion was above the EU average, though in Spain, the figure was less than in 2000 and in the UK, much the same.

By contrast, in Belgium and Slovakia, the proportion of those 50 and over in the workforce was only around 12% and in Portugal, under 9%. Apart from these two countries, however, together with Austria, Poland and Slovenia, where the proportion was 15-17%, the relative number in their 50s and 60s in the industry was close to 20% or above in all countries.

The implication is that in most countries where it is important, the industry will be faced by a growing proportion of the workforce reaching retirement age in the coming years and, accordingly, a growing need to replace them in the context of a prospective decline in population of working age and of falling numbers of young people leaving the education system and entering the labour market.

The changing structure of occupations

Most jobs in the automotive industry are for skilled manual workers, but the structure of jobs is tending to change over time, with an increasing number being created for engineers and other professionals as a reflection of technological advance and the changing organisation of the production process.

In 2006, therefore, just over 55% of the workforce in the industry in the EU were skilled manual workers, down from 62% in 1995. By contrast, around 19% of the workforce were engineers, up from 13% in 1995, a rise of almost 50% over this 11-year period. At the same time, the number of other professionals (in accountancy, marketing and so on) increased from 5% of the workforce to 7% over the period, while the number in managerial positions went up from 4% to just under 5%. These increases were accompanied by a reduction in jobs for both office staff and unskilled workers (Table 3).

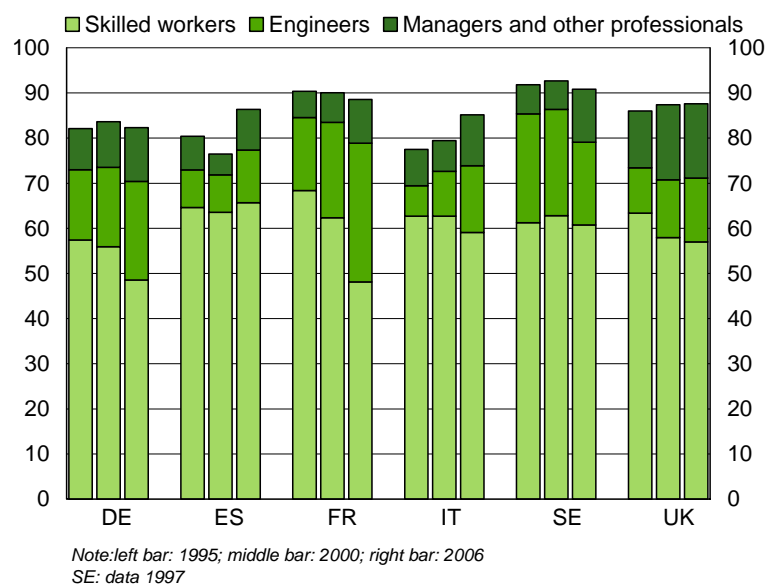
Table 3 Division of employment in the automotive industry by occupation in the EU, 1995-2006

	<i>% total employed</i>											
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Managers	4.1	4.3	4.5	4.5	4.5	4.6	4.5	4.5	4.7	5.0	4.6	4.8
Engineers	12.7	13.8	14.9	14.0	14.5	15.4	15.5	15.6	17.1	16.9	18.0	18.8
Other professionals	4.7	4.6	4.5	4.7	4.8	4.7	4.7	5.5	5.3	5.5	5.5	6.7
Office staff	9.1	8.6	8.1	9.3	8.5	8.7	7.6	7.9	8.3	7.4	7.6	7.9
Sales staff	1.4	1.2	1.3	1.0	1.2	1.0	1.3	1.1	1.1	1.0	1.2	1.2
Skilled workers	61.9	62.8	61.4	61.4	60.7	59.2	60.8	60.2	58.1	58.5	58.5	55.4
Unskilled workers	6.1	4.7	5.3	5.2	5.9	6.3	5.6	5.1	5.5	5.7	4.6	5.2

Source: *EU Labour Force Survey*

These shifts in the structure of jobs in the industry are equally evident in Member States, though there are exceptions. In both Germany and France, therefore, there was a marked shift towards the employment of engineers and away from that of skilled manual workers between 1995 and 2006. In Germany, the proportion of engineers in the workforce increased from 16% to 22% over the period and in France, by even more, from 16% to 31% (Figure 35). In both countries, the proportion of skilled manual workers declined to under 50%.

35 Employment in automotive industry by occupation, 1995, 2000, 2006



Similarly, in Italy, the proportion of engineers more than doubled over the 11 years to 15%, though this was still much lower than in either Germany or France, while in the UK and Spain, the relative number of engineers also rose, though by less than in the other three countries. At the same time, the number of skilled manual workers in the industry in Italy and the UK declined by less than in Germany or France and was still only just under 60% in 2006, and in Spain, it increased slightly to almost 66% of the work force.

In Sweden, the pattern of change was different. While the number of skilled workers in the industry declined as elsewhere, the reduction was relatively small and much less than the decline in engineers, from 24% to 18% over the 11 years. This was accompanied by an increase of almost the same size in the proportion of managers and other professionals.

The pattern of change was also different in the new Member States. In the three main countries for which data are available for most of the period – the Czech Republic, Hungary and Slovakia – the proportion of skilled manual workers in the industry either increased or remained much the same and in 2006 was significantly larger than in the EU15 countries described above. Skilled manual workers, therefore, made up two-thirds of the workforce in the Czech Republic, and over 70% in both Hungary and Slovakia (Figure 36). As a corollary, the relative number of engineers was also smaller in the latter two countries, at only 8-10% of the workforce (Figure 36).

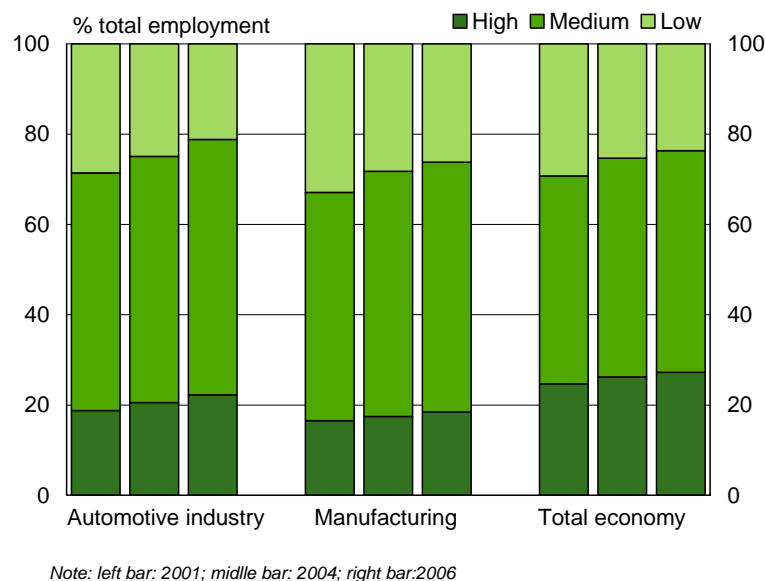
36 Employment in automotive industry by occupation, 1996, 2000, 2006



The changing education level of the workforce

Reflecting the shift in the structure of occupations in the automotive industry, the proportion of the workforce with tertiary – or university – education has tended to rise over the years. Although comparable data on education levels are available only from 2001, they show that over the five years up to 2006, the proportion of workers in the industry with university degrees or the equivalent increased from under 19% to over 22% in the EU, more than in manufacturing as a whole or in the total economy (Figure 37). At the same time, the number employed with only basic schooling declined from almost 29% to 21%, again a bigger reduction than elsewhere in the economy.

37 Division of employment by education level in automotive industry, manufacturing and total economy in the EU, 2001, 2004, 2006



Although these shifts are also apparent in Member States, this is not universally the case. While growth in the proportion of university graduates – engineers and the like – is very evident in Belgium, Germany, Spain, France and the UK, it is less evident in Italy, Austria and Sweden (Figure 38). It is also less evident in the new Member States, and indeed in Hungary and, marginally, in Poland, the proportion of the workforce with university degrees declined between 2001 and 2006.

38 Division of employment by education level in automotive industry, 2001 and 2006



In all the new Member States apart from Poland, moreover, the relative number of university graduates employed in the automotive industry was comparatively small – only around 9% in the Czech Republic and Slovakia and just 7% in Hungary, well below the proportion of graduates in total employment in the economy. This was also, however, the case in Italy, while in Sweden, despite the proportion being much larger (17%), it was only around half of the proportion in the economy as a whole (33%). This contrasts with the situation in Germany, where the proportion of university graduates in the industry’s workforce is much the same as in the economy as a whole, and in Austria as well as Spain, where it is slightly larger.

2. The Automotive industry in the EU – Trends in occupational structure and skill needs

It is possible to gain an indication of the breakdown of employment in the automotive industry between types of job, or of occupation, and how this has tended to change over recent years from the data collected by the EU Labour Force Survey. Since, however, this is a survey based on a relatively small sample of households and the people living in them, there is inevitably a margin of uncertainty surrounding the figures, and still more as regards changes over time, so they need to be interpreted with this in mind (see Box). Nevertheless, the figures give an indication of the relative importance of different types of job, of the characteristics of the people performing them and of trends over recent years, as well as of differences in various respects between EU Member States. They also enable the structure of employment in the industry and the various trends concerned to be compared with the situation in manufacturing as a whole.

The following analysis examines, first, the division of employment in the automotive industry in the EU between different types of occupation, distinguishing those which seem to be most relevant in terms of the skills, and education levels, required, and how this differs between Member States and has changed over the past 7 years or so in relation to changes in other parts of the economy.

Secondly, it examines the education attainment levels of those employed in the different jobs and how these differ across Member States, as well as the changes which have occurred over the recent past, insofar as it possible to do so from the data available, to see, in particular, the extent to which education levels have tended to increase.

Thirdly, it considers the broad age structure of the workforce in the different types of job and how these are divided between men and women as well as the extent to which they have changed over recent years as a reflection of the general ageing of the population and the increasing participation of women in economic activity.

Throughout the analysis, the situation in EU15 countries is distinguished from that in the new Member States because of the different situation in the industry in the two parts of the Union as well as the very different underlying circumstances and education and training system.

The occupational structure of employment across the EU

Most of those employed in the motor vehicle industry in the EU15 countries are still manual workers (around 60% in total), most of them employed in skilled or at least semi-skilled jobs, while the figure was closer to 70% in the new Member States. In 2007³, around 29% of the total employed in the EU15 countries worked as metal moulders, tool-makers or mechanics of some kind, while another 25% worked in jobs which require less training, as machine operators or drivers and 7% worked in low skilled manual jobs as labourers, cleaners, canteen assistants and so on (Table A).

Most – around two-thirds – of the other 40% or so in employment were trained professionals or technicians, either engineers (15% of the total work force), business, sales or financial specialists (3-4% of the total), computer engineers or other IT experts (around 2% of the total) or other kinds of specialists (administrative, legal, etc., making up 6-7% of the total employed) working in quality control, R&D, design, marketing and so on, as well as perhaps

³ Specifically in the second quarter which should be reasonably representative of employment in the year as a whole.

production as such. The remainder were production managers (2% of the total employed) other managers or directors (3-4%), secretaries, clerks and other office workers (7% of the total) or sales and service workers (just 1% of the total).

Box: The Labour Force Survey data on occupations and educational attainment levels

The Labour Force Survey (LFS) is conducted every quarter on a reasonably comparable basis in all EU Member States. It has the merit of being relatively up-to-date – the second quarter figures for 2007, which should be reasonably representative of 2007 as a whole, became available at the end of 2007 – and of covering at least the last 10 years for nearly all countries. However, the fact that it is based on a sample of households, which even though designed to be representative of the population as a whole is still relatively small, covering in most countries between 0.3% and 0.6% of the population, means that there is an inevitably a margin of error surrounding the figures reported. This is all the more the case when the industry being examined itself is relatively small, accounting for around 1% or so of the total in employment and even less of the total population.

The uncertainty surrounding the figures is especially relevant in respect of occupations more than other aspects of employment, since the relatively imprecise way these are defined together with differences in national conventions leaves scope for variation in how given types of job are classified both between those surveyed in different countries and between the countries themselves.

Moreover, the margin of error affects comparisons from year to year, in particular, since the sample covered changes each year and may accordingly be more or less representative of the actual people in the industry and of the jobs they do. The changes recorded may, therefore, in some cases simply reflect the change in the sample and the relative number in this who happen to work in the industry.

The degree of uncertainty surrounding the data increases when those employed in different types of job within the industry are broken down further in terms of their characteristics since the number of observations concerned is correspondingly smaller. This is especially the case, of course, in respect of jobs in which relatively few people are employed.

In addition, uncertainty is a particular issue with regard to data on education attainment level given the differences between national education systems which can sometimes make comparisons across countries problematic, especially for those who passed through the system many years before. At the same time, because of the revision to the ISCED classification system in 1998 and the several years it took for this to be applied in a comparable way across countries, the data for education levels are reasonably consistent over time only for the most recent years.

Both because of the small sample size and the nature of the data, the figures for the breakdown of those employed in different occupations employment by education level are, therefore, particularly uncertain, especially as regards comparisons across countries and even more so over the time. The results presented in the text should, accordingly, be regarded as giving an approximate indication of the division of employment in these terms both across countries and over time rather than a precise one.

The division of employment between jobs is similar to that in manufacturing as a whole, at least in terms of broad types of job. The main differences are that there are more professional

engineers and machine operators in the automotive industry than in other sectors and slightly fewer managers and sales and service workers, the former perhaps reflecting the larger scale of enterprise in the automotive industry, as well as differences in the composition of skilled workers, as would be expected.

Table A Division of employment by occupation, 2007

	<i>% of total employed in sector</i>								
	DE	FR	Automotive industry			EU15	NMS	Manufacturing	
			IT	SE	UK			EU15	NMS
Managers	4.4	4.1	2.8	3.3	13.9	5.3	3.5	7.6	3.8
Production	1.7	1.0	0.5	1.8	5.3	1.8	2.1	2.3	1.5
Other	2.7	3.1	2.3	1.6	8.6	3.5	1.3	5.3	2.3
Professionals+technicians	27.3	30.8	28.4	27.8	19.8	26.0	18.6	22.6	16.5
Engineers	15.0	22.7	15.5	19.0	12.5	15.1	8.2	10.2	7.2
Computer specialists	1.5	2.2	1.5	2.1	1.6	1.7	2.4	1.6	1.3
Other professionals	10.8	5.8	11.4	6.8	5.7	9.2	8.0	10.8	8.1
Business, finance, sales	4.2	1.8	3.5	3.7	4.2	3.4	1.5	3.9	1.5
Administrative+other	6.6	4.1	7.9	3.1	1.5	5.8	6.5	6.9	6.6
Office workers	8.5	5.8	8.6	6.5	5.9	7.3	5.0	8.9	5.0
Sales+service workers	1.1	0.6	1.1	0.2	0.6	0.9	0.2	2.9	1.3
Skilled manual workers	33.9	30.7	16.8	11.7	26.5	28.7	26.2	28.9	36.4
Metal moulders	6.4	3.3	5.0	3.0	7.5	6.3	8.0	4.5	6.3
Tool makers	6.3	5.4	2.1	3.1	4.3	4.8	7.1	3.5	5.9
Mechanics	11.3	9.1	5.1	2.5	9.1	9.3	6.0	4.5	2.7
Electricians+others	9.9	12.9	4.6	3.0	5.6	8.3	5.1	16.3	21.5
Semi-skilled workers	16.8	24.8	35.0	48.4	27.6	25.1	44.4	21.8	30.2
Machine operators	14.2	19.8	34.4	43.7	23.7	22.0	41.3	19.1	26.5
Drivers	2.6	5.0	0.6	4.7	3.9	3.2	3.1	2.7	3.7
Low skilled workers	8.0	3.2	7.3	2.1	5.7	6.7	2.2	7.4	6.7

The division of employment between jobs in the automotive industry is also broadly similar across EU15 countries, though there are differences. In particular, in Germany as well as Austria, a larger proportion of the workforce is employed in skilled manual jobs, especially as mechanics, than in other countries, and a smaller proportion as machine operators. How far this reflects differences in the structure of the industry and the composition of production, how far differences in the production process and in the organisation of production and how far differences in the classification of essentially similar jobs is an open question. Certainly the specialisation of production in Germany in high quality, well engineered and high value-added vehicles points to differences in the structure of production and genuine differences in the jobs to be performed as being important.

By contrast, a much smaller proportion of jobs are for mechanics and other skilled manual workers in Spain and Italy and above all in Sweden (in both Italy and Sweden, under half the proportion in Germany) than in the rest of the EU and a larger proportion for machine operators and production line workers (45% in Spain and 48% in Sweden as against just 17% in Germany).

In Spain also, as well as in Portugal, many fewer of the workforce are employed as professionals or technicians, especially as engineers, than in other countries (only 6-7% of the total – under half the average elsewhere in the EU15). The proportion of professionals is also small in the UK, but here unlike in the former two countries, a much larger number of the workforce are classified as managers, many of whom would almost certainly be classified as professionals in other countries.

The relative number of professionals, and engineers in particular, employed in the industry in the new Member States is also relatively small (only around 8% on average), while the number of machine operators and production line workers is much larger than the average in the EU15 (44% as against 25%) and similar to the proportion in Spain. Moreover, the division in each of the individual countries in question is broadly similar to this, again reflecting the different structure of production than in the EU15, and in Germany in particular, and the differing importance of different types of job.

Trends in the structure of employment

Although there are some differences across the EU in the way the division of employment between different types of job, or occupation, has changed over recent years, there has been a widespread tendency in the EU15 for the relative number of people employed as engineers and as other specialist professionals or technicians to increase and the number of skilled manual workers to decline. Over the 7 years 1999-2000 to 2006-2007⁴, therefore, the number of both engineers and other professionals (specialists in business, sales, finance, quality control and so on) as a proportion of the total employed both increased by around 3 percentage points in the EU15 countries taken together (Table B).

Table B Change in division of employment by occupation, 1999-2000 to 2006-2007

	<i>Percentage point change in division</i>								
	Automotive industry					EU15		Manufacturing	
	DE	FR	IT	SE	UK	EU15	NMS	EU15	NMS
Managers	0.9	2.0	0.2	1.8	0.8	0.7	-0.4	0.9	0.4
Production	0.2	0.3	-1.8	0.6	-0.8	-0.3	0.6	0.0	0.5
Other	0.7	1.7	1.9	1.2	1.5	0.9	-1.0	0.9	0.0
Professionals+technicians	4.7	6.8	13.1	-2.3	4.6	5.9	0.9	4.2	1.0
Engineers	2.7	4.2	6.4	-4.4	2.8	2.9	0.9	1.8	3.2
Computer specialists	0.1	0.6	0.3	0.8	0.5	0.4	0.9	0.3	0.6
Other professionals	1.9	1.9	6.4	1.3	1.3	2.7	-0.9	2.1	-2.9
Business, finance, sales	1.4	0.2	0.8	-0.6	1.3	0.9	-0.6	0.6	0.3
Administrative+other	0.5	1.7	5.6	1.9	0.0	1.7	-0.3	1.5	-3.1
Office workers	-0.3	0.9	-4.0	-1.0	-2.8	-0.7	-0.2	-1.1	-0.2
Sales+service workers	0.2	0.2	-0.5	0.4	-0.5	-0.1	-0.8	0.2	0.0
Skilled manual workers	-7.5	-2.8	-2.2	-3.5	-2.9	-4.7	-13.7	-3.2	-7.4
Metal moulders	-2.1	-1.8	-0.8	-0.5	-0.7	-1.1	1.5	-7.3	-11.8
Tool makers	-0.9	-1.2	0.9	0.5	-1.6	-0.7	-9.4	-0.6	2.3
Mechanics	-2.1	-6.6	-4.4	-3.2	0.6	-2.9	-2.5	0.2	-1.0
Electricians+others	-2.4	6.8	2.1	-0.3	-1.2	0.1	-3.2	4.4	3.2
Semi-skilled workers	1.0	-7.4	-7.6	4.3	-1.6	-1.1	18.1	-1.6	7.5
Machine operators	0.7	-9.2	-6.1	1.8	-3.3	-1.8	18.2	-1.9	6.1
Drivers	0.3	1.8	-1.5	2.5	1.7	0.7	-0.1	0.3	1.5
Low skilled workers	0.9	0.3	0.9	0.4	2.4	-0.1	-3.9	0.6	-1.3

Note: The changes give an indication of the changes over this period but because of the sample nature of the data, they should not be regarded as being precise.

Conversely, the number employed as skilled manual workers, especially as mechanics, declined by almost 5 percentage points. At the same time, the relative number of machine operators as well as secretaries and other office workers also declined, though by much less (at least in relation to the total employed), while the relative number of managers increased.

⁴ An average is taken of the beginning and end years of the period in order to take account in some degree of year-to-year fluctuations in the division of employment between occupations resulting from the relatively small sample size of the LFS, as noted above.

Overall, therefore, there was a shift of employment away from jobs requiring lengthy vocational training towards those requiring, for the most part, even longer education (see below).

This pattern of change in the automotive industry is similar to that which occurred over the same period in manufacturing as a whole in the EU15, though slightly more accentuated, in the sense that there was more of an increase in jobs for engineers and other professionals in the automotive industry than in the rest of manufacturing and more of a reduction in those for skilled manual workers.

Much the same pattern is evident in the individual EU15 countries in which the automotive industry is relatively important in terms of employment – and value-added. Although the precise scale of the shifts concerned varies between countries (in part reflecting problems of small sample size), in most Member States, the relative number of engineers and other professionals increased and the relative number of skilled manual workers declined. The main exception is Sweden, where the proportion of engineers in particular declined over the period, though the apparent reduction (which in some degree might be a result of data inconsistencies) was concentrated in the early years of the period and over the more recent years, there has been a small increase. Much the same is true of the Netherlands, where the industry employs many fewer people, especially in relation to total employment, though in Belgium, the data suggest a continuing fall in the relative number of engineers working in the industry, which in this case might reflect the changing structure of the industry with plant closures.

In the new Member States, the increase in employment of engineers was smaller on average than in the EU15 countries taken together and here it was accompanied by a similar increase in the employment of computer specialists but a decline in that of other specialist professionals (business, financial and marketing specialists in particular). On the other hand, there was a much larger reduction in the relative number of tool-makers, mechanics and other skilled manual workers employed in the industry than in the EU15 and a counterpart increase in the number of machine operators and production line workers (though the scale of the change reported by the LFS might exaggerate the shift which occurred).

This shift is evident in all the individual countries concerned – or at least those in which the data are available for all of the years – with the sole exception of Slovenia, where the number employed in the industry is relatively small. It is also evident in Poland over the three years 2004 to 2007, which are the only ones for which data at this level of disaggregation are available⁵.

In the new Member States, therefore, the main shift in employment which has occurred in the industry in recent years has, therefore, been from skilled jobs requiring relatively lengthy vocational training to those requiring less. A similar shift is evident for manufacturing as a whole over the 7-year period though it is less pronounced.

The education levels of workers employed by type of job

Examination of the education levels –i.e. the highest level of educational qualification attained – of those employed in the automotive industry reveals a relatively high degree of similarity across the EU in the level of those working in the same type of job, There are differences, however, between EU15 countries and the new Member States, reflecting to some extent the significantly smaller number of university graduates (those with tertiary level

⁵ No data for NACE 2-digit sectors, including for NACE 34, the automotive industry, are available from the LFS before 2004.

qualifications) among those of working age in most of the latter countries than in most of the former. Differences between EU15 countries partly reflect similar differences and indicate that those working in much the same type of job have very different educational and vocational training backgrounds in some countries as compared with others.

Almost 60% of those in managerial positions in the automotive industry in the EU15 have university degrees or the equivalent, with the figure being below 50% only in Italy, the Netherlands and Sweden (Table C, where tertiary qualifications are labelled 'high', upper secondary, 'medium' and basic education – ie no qualifications beyond compulsory schooling, 'low'). In the new Member States, the figure is only slightly lower on average, but in the three countries where the industry is largest in terms of employment – the Czech Republic, Hungary and Slovakia – the figure is only around 40%. In all the new Member States, however, all managers have at least upper secondary education, whereas in the EU15, there is a small proportion (7%) with only basic schooling.

In both the EU15 and new Member States, education levels of managers in the automotive industry are higher on average than in the rest of manufacturing.

Among professionals and technicians employed in the automotive industry, education levels are similarly high in the EU15, though less so in the new Member States. This applies, in particular, to engineers, 65% of whom have tertiary education in the EU15, significantly more than in the rest of manufacturing, with only the three countries listed above – Italy, the Netherlands and Sweden – together with Belgium having a figure of less than 50%. This proportion of engineers with tertiary education is especially low in Italy at only 20% and as many as 23% of those employed in such jobs in the industry have no qualifications beyond basic schooling. In the new Member States, under 40% of engineers in the industry have tertiary education – just 23% in the Czech Republic – while almost 60% have upper secondary education (mostly vocational training qualifications).

Other professionals working in the industry tend to have lower educational qualifications on average. Some 40% of those employed as business, finance or marketing specialists in the EU15 have tertiary education, slightly less than in the new Member States, while just over half in both cases have upper secondary qualifications, the figures being much the same as in the rest of manufacturing. Among those in other professional positions (administration, quality control, human resources, etc.), the proportion with tertiary education is lower still, at around 30% in the EU15 and just 22% in the new Member States on average (only 15% in the Czech Republic), in both cases, much lower than in manufacturing as a whole. At the same time, some 10% of those employed in such positions in the EU15 (36% in Portugal) have only a basic level of education, whereas in the new Member States, the figure is less than 1%.

Among those employed in secretarial and clerical jobs, the relative number with tertiary education is lower still, as would be expected, at only 15% in the EU15 and just 2% in the new Member States. Equally, over 20% of those working in such jobs in the EU15 have no qualifications beyond compulsory schooling as against 5% in the new Member States. These figures are much the same as in the rest of manufacturing.

Those employed in different types of skilled manual job in the industry, as tool-makers, mechanics and so on, have a similar educational profile. Most of them have upper secondary qualifications – 63% in the EU15, more than in the rest of manufacturing, and 94% in the new Member States – relatively few of them have tertiary education (around 9% on average in the EU15 and virtually no-one in the new Member States, in both cases, much the same as in manufacturing as a whole) and a substantial proportion (29% and over 15% in all individual countries) have only basic education in the EU15 and only a small number in the new

Member States (6%), both figures lower than in the rest of manufacturing. This sizeable latter group in the EU15 are those who have learned their skills on the job over a number of years rather than through formal vocational training, most of them being in older age groups. The proportion concerned is particularly large in Belgium (44%), Spain (46%), Italy (64%) and, above all, Portugal (81%).

Table C Employment in automotive industry by education level, 2007

		<i>% of total employed in each occupation in sector</i>								
		Automotive industry							Manufacturing	
		DE	FR	IT	SE	UK	EU15	NMS	EU15	NMS
Managers	1. Low	4.6	11.3	13.9	4.4	7.1	7.1	0.0	16.5	2.2
	2. Medium	34.2	8.4	44.6	47.5	41.6	33.6	42.6	37.3	47.6
	3. High	61.2	80.4	41.5	48.1	51.4	59.3	57.4	46.2	50.2
Professionals+ technicians	1. Low	4.5	7.8	18.2	5.3	5.2	7.5	1.6	9.5	1.3
	2. Medium	39.3	35.8	63.7	58.7	34.1	39.7	66.4	43.1	58.0
	3. High	56.2	56.3	18.0	36.0	60.7	52.8	32.0	47.4	40.7
Engineers	1. Low	1.9	9.6	23.3	3.9	4.5	5.8	2.5	8.4	0.6
	2. Medium	26.4	31.0	57.2	60.2	26.3	29.4	59.4	39.5	53.0
	3. High	71.6	59.4	19.5	35.9	69.1	64.5	38.1	52.1	46.4
Computer specialists	1. Low	3.2	2.2	29.9	16.0	0.0	6.4	4.4	5.9	2.4
	2. Medium	35.4	38.9	64.3	54.8	37.3	41.1	73.8	42.5	50.8
	3. High	61.3	58.9	5.7	29.2	62.7	51.5	21.7	51.7	46.8
Other professionals	1. Low	8.2	3.2	9.7	5.7	8.3	8.8	0.6	10.8	1.4
	2. Medium	57.7	53.5	72.6	55.7	50.4	54.8	73.9	46.5	64.0
	3. High	34.1	43.3	17.7	38.6	41.4	36.4	25.5	42.8	34.6
Business, finance, sales	1. Low	4.5	0.0	12.3	5.7	6.4	8.2	0.0	11.5	0.2
	2. Medium	50.9	59.6	82.6	51.8	47.8	51.5	51.8	49.3	56.6
	3. High	44.6	40.4	5.2	42.5	45.8	40.3	48.2	39.2	43.2
Administrative+other	1. Low	10.6	4.5	8.6	5.8	13.5	10.2	0.7	10.4	1.8
	2. Medium	62.0	50.8	68.2	60.4	57.5	57.7	77.3	44.5	65.8
	3. High	27.4	44.6	23.1	33.8	29.1	31.4	22.0	45.1	32.5
Office workers	1. Low	11.6	29.8	35.0	25.1	31.3	21.3	5.2	23.2	5.4
	2. Medium	76.4	54.1	57.5	62.4	57.8	63.2	92.8	61.3	88.6
	3. High	12.0	16.1	7.5	12.5	10.9	15.1	2.0	15.3	5.9
Skilled manual	1. Low	15.6	31.8	64.1	26.5	24.2	29.0	6.0	36.9	8.8
	2. Medium	78.0	65.3	35.9	70.6	61.8	62.5	93.7	54.6	90.4
	3. High	6.4	2.9	0.0	2.9	14.0	8.5	0.4	8.5	0.8
Metal moulders	1. Low	16.3	21.8	52.5	34.7	15.2	28.8	6.5	39.7	8.1
	2. Medium	78.7	78.2	47.5	65.3	72.2	65.9	92.3	55.5	91.6
	3. High	4.9	0.0	0.0	0.0	12.6	5.3	1.2	4.7	0.3
Tool makers	1. Low	12.7	42.8	68.3	18.3	23.9	29.6	8.5	36.4	7.0
	2. Medium	82.8	56.5	31.7	76.3	71.6	63.6	90.3	57.1	91.7
	3. High	4.5	0.7	0.0	5.3	4.4	6.8	1.2	6.4	1.3
Mechanics	1. Low	15.7	22.6	67.6	32.8	17.5	24.9	5.1	29.5	2.9
	2. Medium	77.7	73.5	32.4	60.3	60.2	65.1	94.9	60.5	96.9
	3. High	6.5	3.9	0.0	6.9	22.3	10.0	0.0	10.0	0.3
Electricians+others	1. Low	16.9	36.1	71.1	21.4	47.2	30.5	8.5	38.2	10.5
	2. Medium	74.8	60.0	28.9	78.6	42.7	58.4	91.5	51.8	88.4
	3. High	8.3	3.9	0.0	0.0	10.1	11.1	0.0	9.9	1.1
Semi-skilled	1. Low	27.2	34.0	58.1	20.8	47.6	37.9	14.2	45.7	16.3
	2. Medium	69.4	61.5	41.9	74.1	49.0	57.3	85.3	49.2	82.8
	3. High	3.4	4.5	0.0	5.1	3.4	4.8	0.5	5.1	0.8
Production line	1. Low	27.2	30.8	57.9	21.6	49.3	37.5	14.3	45.4	16.3
	2. Medium	70.1	63.6	42.1	72.7	47.9	58.0	85.1	49.3	82.8
	3. High	2.8	5.7	0.0	5.7	2.8	4.4	0.6	5.4	0.9
Drivers	1. Low	27.4	46.7	70.6	13.1	37.3	40.7	11.9	49.9	16.0
	2. Medium	65.4	53.3	29.4	86.9	56.0	52.6	88.1	47.0	83.6
	3. High	7.3	0.0	0.0	0.0	6.8	6.7	0.0	3.1	0.4
Low skilled	1. Low	43.3	44.2	63.3	22.7	41.0	45.1	21.8	55.1	32.2
	2. Medium	54.9	47.5	36.7	77.3	56.0	48.6	78.2	40.7	67.4
	3. High	1.8	8.3	0.0	0.0	3.0	6.3	0.0	4.2	0.4

Among semi-skilled manual workers in the automotive industry – i.e. those working as machine operators or on production lines – as in manufacturing as a whole, the proportion with tertiary education is lower still at only 5% in the EU15 and less than 1% in the new Member States. The proportion with upper secondary qualifications, however, is also smaller, at around 57% in the EU15, though still at 85% in the new Member States. A large number of people working in this type of job, therefore, have only basic schooling – 38% in the EU15 – and over 55% in Spain and Italy and almost 80% in Portugal. In the new Member States, the figure is much lower on average at only 14%, as it is in Sweden (21%) and, to a lesser extent, in Germany (27%).

Among low skilled workers employed as labourers, cleaners and so on in the automotive industry, the proportion with any educational qualifications beyond basic schooling is only just over half (55%), though this is a more than in the rest of manufacturing. In the new Member States, however, it is almost 80% on average. It is much the same in Sweden, in sharp contrast with other EU15 countries, where in all cases, the figure is under 60%.

Changes in education levels

The average education level of those employed in the automotive industry, as in other parts of the economy, has tended to increase over time as a result of both jobs requiring higher education increasing in importance and a growing number of those employed in particular jobs having tertiary or upper secondary qualifications. The latter reflects, in turn, the fact that young people taking up jobs and replacing older workers who retire tend to have higher levels of education than the latter. How far this reflects simply the rise in educational attainment levels over time as more young people remain longer in education and initial vocational training and how far the increasing educational or skill requirements of jobs is an open question.

This pattern of change, however, is more evident in the EU15 countries than the new Member States where the great majority of the population working age already had upper secondary education, mostly in the form of vocational qualifications, and where the relative number who have completed university degree courses or the equivalent remains small in the Czech Republic, Hungary and Slovakia, in particular, and is tending to increase only slowly.

The tendency for the education levels of workers to increase over the past 5 years (examining changes over a longer period is problematic because of the limited comparability of the LFS data on educational attainment, as noted above) is evident in most jobs in both the automotive industry and in the rest of manufacturing. Among managers and, to a lesser extent, among professionals, the increase in EU15 countries between 2001-2002 and 2006-2007 took the form mainly of a rise in the proportion of those with university degrees or the equivalent (Table D). This seems also to have been the case for managers in the new Member States, though the scale of the increase is uncertain because of relatively small number of people concerned. In the case of professionals in the new Member States, however, there seems to have been some decline in the proportion of university graduates and a counterpart rise in the number with upper secondary education.

Among skilled manual workers, on the other hand, the increase in education levels in the EU15 came more from a rise in employment of those with upper secondary qualifications, though there was also a rise in nearly all countries coupled with a reduction in that of those with only basic schooling. In the EU15 countries taken together, therefore, the proportion of those with upper secondary education in the automotive industry increased by almost 5 percentage points over the 5 year period while the proportion with only basic schooling

declined by much the same amount. A similar pattern of change, though on a smaller scale, is also evident in the new Member States.

Table D Change in employment in automotive industry by education level, 2001-02 to 2006-07

		<i>Percentage point change</i>								
		Automotive industry							Manufacturing	
		DE	FR	IT	SE	UK	EU15	NMS	EU15	NMS
Managers	1. Low	0.1	0.3	-7.3	-1.4	-3.9	-2.7	0.1	1.2	0.0
	2. Medium	-4.9	-27.2	-13.8	-19.9	-0.2	-5.7	1.7	1.5	-0.2
	3. High	4.8	26.9	21.1	21.3	4.2	8.4	-2.8	-2.7	0.2
Professionals+ technicians	1. Low	-0.6	0.7	-4.0	-3.3	-1.9	-1.7	0.2	-2.9	-0.9
	2. Medium	-1.5	-5.9	6.1	7.4	-2.2	0.1	3.6	-3.8	-10.0
	3. High	2.1	5.3	-2.1	-4.1	4.0	1.6	-3.8	6.7	10.9
Engineers	1. Low	-0.3	2.1	8.3	-1.9	-3.1	0.6		-1.1	
	2. Medium	-4.8	-8.3	4.5	3.9	-8.5	-3.2		-2.4	
	3. High	5.0	6.3	-12.8	-2.0	11.6	3.7		3.5	
Computer specialists	1. Low	0.8	9.1	7.7	-8.2	6.3	3.3		-3.1	
	2. Medium	-5.1	1.9	-15.8	20.4	1.5	-0.2		-1.4	
	3. High	4.2	-11.1	8.1	-12.2	-7.8	-2.1		4.5	
Other professionals	1. Low	-1.6	-10.7	-20.2	-4.8	-0.8	-6.5	-1.5	-4.4	-1.1
	2. Medium	2.4	-2.6	14.9	11.3	11.3	5.4	6.2	-5.7	-8.6
	3. High	-0.9	13.3	5.3	-6.5	-10.5	1.1	-4.7	10.0	9.8
Office workers	1. Low	0.9	5.4	3.0	9.5	4.7	2.1	-2.1	-3.0	-1.4
	2. Medium	-0.7	-2.9	-5.7	-14.6	-1.8	-1.6	2.1	-0.1	-1.5
	3. High	-0.2	-2.5	2.7	5.1	-3.0	-0.6	0.0	3.0	2.9
Skilled manual	1. Low	-2.7	-3.9	-11.6	-1.3	-5.3	-5.0	-1.5	-3.4	-2.9
	2. Medium	3.8	4.2	12.2	0.6	1.6	4.6	1.2	2.2	2.6
	3. High	-1.1	-0.3	-0.6	0.7	3.7	0.3	0.3	1.2	0.3
Semi-skilled	1. Low	-3.6	-11.6	-17.4	-3.1	-9.6	-7.5	0.2	-7.9	-5.5
	2. Medium	4.2	10.1	17.3	1.1	11.3	7.7	-0.4	7.1	5.1
	3. High	-0.6	1.5	0.1	1.9	-1.7	-0.2	0.3	0.8	0.5

Note: The changes give an indication of the changes over this period but because of the sample nature of the data, they should not be regarded as being precise. No data are shown for engineers and computer specialists separately because of reliability problems.

Much the same was the case in the EU15 among semi-skilled manual workers, the relative number of those employed as machine operators with upper secondary qualifications increasing by almost 8 percentage points on average and again the proportion of those with only basic schooling declining to a similar extent, a pattern also evident in the rest of manufacturing. In the new Member States, where the proportion of machine operators with upper secondary education was already very high, there was relatively little change.

Among low skilled workers, there was also an increase in the proportion of those employed in the automotive industry with at least upper secondary education, though this was smaller than in manufacturing as a whole. (In the new Member States, the numbers involved are too small to give a reliable indication of the change.)

The age distribution of employment

Some 21% of all those employed in the automotive industry in the EU15 are aged 50 and over, implying that some 1-2% of the work force is likely to retire over the next 7 years or so and will, accordingly need to be replaced if employment were to remain at around its present level, though not necessarily by workers with the same skill profile. In the new Member States, this proportion is lower at 16%., in part reflecting the recent growth in the industry and the greater recruitment of young people. The proportion of people of this age, however, varies markedly between different types of job, so that some skills will need replacing on a larger scale than others.

As might be expected, the proportion of people aged 50 and over is larger than average among those in managerial positions, the figure being close to 30% on average in both the EU15 and the new Member States and even higher in some countries – Spain, the Czech Republic, Hungary and, most especially, in the UK (34%), where the number of people classified as managers is particularly large (Table E). These figures, however, are less than in manufacturing as a whole, where the proportion of workers of 50 and over is a third in the EU15 and 35% in the new Member States. Managers in the automotive industry, therefore, tend to be younger than in other part of manufacturing.

Table E Employment in automotive industry by age group, 2007

		<i>% of total employed in each occupation in sector</i>								
		Automotive industry						Manufacturing		
		DE	FR	IT	SE	UK	EU15	NMS	EU15	NMS
Managers	15-39	35	51	4	20	29	34	37	33	36
	40-49	37	26	72	52	37	37	34	35	29
	50+	28	23	24	28	34	29	29	33	35
Professionals+ technicians	15-39	48	55	62	51	53	53	54		
	40-49	35	18	23	28	32	29	28		
	50+	17	27	15	22	15	19	19		
Engineers	15-39	47	56	60	50	55	52	51	48	47
	40-49	36	17	24	28	30	29	27	29	25
	50+	18	26	16	21	15	19	21	23	29
Computer specialists	15-39	64	41	88	54	41	59	65	58	68
	40-49	27	21	10	21	48	25	29	28	21
	50+	9	38	2	25	11	17	6	14	11
Other professionals	15-39	41	55	54	40	69	48	62		
	40-49	30	15	23	28	26	26	26		
	50+	29	30	23	32	5	25	12		
Business, finance, sales	15-39	43	67	34	39	63	48	71	48	61
	40-49	26	22	32	37	30	27	23	29	23
	50+	31	11	34	24	6	25	7	23	16
Administrative+ other	15-39	40	50	63	42	87	48	61	50	57
	40-49	32	12	19	17	13	26	27	28	24
	50+	28	38	19	41	-	26	13	22	19
Office workers	15-39	51	29	62	40	46	51	63	50	53
	40-49	30	25	27	25	16	25	27	27	28
	50+	19	47	11	34	37	24	10	23	19
Skilled manual v	15-39	50	48	44	57	42	50	55		
	40-49	30	28	34	19	32	29	26		
	50+	20	23	22	24	25	21	19		
Metal moulders	15-39	40	28	46	49	36	45	58	48	45
	40-49	35	48	39	13	29	32	24	28	29
	50+	25	24	15	38	35	24	18	23	26
Tool makers	15-39	43	46	17	57	35	43	45	47	41
	40-49	32	33	39	22	46	32	30	28	29
	50+	25	21	44	21	19	25	24	25	30
Mechanics	15-39	58	48	51	61	55	55	66	51	50
	40-49	26	23	24	25	27	26	26	27	28
	50+	15	29	24	15	18	19	8	23	23
Electricians+ others	15-39	53	54	48	62	36	52	54	50	57
	40-49	29	25	35	18	34	29	24	27	25
	50+	18	20	17	19	29	20	23	23	18
Semi-skilled	15-39	37	64	56	58	48	51	63		
	40-49	41	24	26	25	30	30	22		
	50+	22	12	18	17	22	19	14		
Production line	15-39	39	60	57	62	48	51	63	50	57
	40-49	42	27	25	21	29	30	22	29	25
	50+	20	13	18	17	23	18	14	21	18
Drivers	15-39	31	80	32	29	44	50	65	42	53
	40-49	34	12	62	58	35	28	22	31	24
	50+	35	9	5	14	21	22	14	27	24
Low skilled	15-39	46	54	51	42	45	49	42	48	60
	40-49	33	12	28	28	20	28	29	27	22
	50+	21	35	21	30	35	24	29	25	18

A much smaller proportion of engineers working in the automotive industry fall into this age group, only 19% on average in the EU15 and 21% in the new Member States, though more in France (26%) and the Czech Republic (25%). The proportion in the industry in this age group is again smaller than in the rest of manufacturing.

The relative number of computer specialists aged 50 and over is smaller still, especially in the new Member States (only 6% on average) as well as in the UK (11%), Germany (9%) and Italy (2%), though not in Spain (25%) or France (38%).

Among other professionals – those specialising in business, finance, sales, administration and so on – the proportion aged 50 and over is higher in the EU15 (25% on average), though not in the new Member States (only 12%).

The proportion in the older age group is similar for secretaries and clerical workers in both the EU15 (24%) and the new Member States (10%), the relatively low figure in the latter again reflecting the much younger age structure of workers.

Among skilled manual workers, the relative number of those aged 50 and over is similar to the average for the industry in the EU15 (21%), though slightly larger (19%) in the new Member States. The proportion, however, varies between those with different types of skill. In particular, it is higher among metal moulders and tool-makers (25%) than among mechanics, implying that the need to replace those likely to retire in the next few years might be especially acute for these skills. The proportion is particularly high in respect of metal moulders in the UK and Sweden at 35% or more – though the number of people involved in the latter is relatively small (only 3% of the total workforce as opposed to around 8% in the UK).

Among semi-skilled workers operating machines, some 19% of those employed in the EU15 and 14% in the new Member States fall into the older age group, suggesting that potential problems of replacement are likely to be less than for skilled workers.

The proportion of low skilled workers who are 50 or over is larger than for most other jobs in the industry in both the EU15 and the new Member States, especially the latter (29%), though potential recruitment problems to replace those retiring are unlikely to be a major issue given the minimal training typically required.

Changes in the age structure

Overall, there was little change in the age structure of employment in the automotive industry over the 7 years 1999-2000 to 2006-2007 in the EU15 countries but an increase in age in the new Member States. The proportion of workers those aged 50 and over, therefore, remained much the same over this period in the EU15 while in the new Member States, it increased by 3 percentage points. Nevertheless, there were some changes in certain types of job in the EU15 as well as in the new Member States.

Among managers, there was a reduction in the relative number aged 50 and over the period, especially in the new Member States, while among engineers, there was a slight increase in the EU15 but a significant decline in the new Member States (Table F). The increase in the proportion in this age group was more marked for other specialist professionals (in business, finance and so on) in the EU15 – some 4 percentage points – while in the new Member States, there was again a decline, even if relatively small.

Among skilled manual workers, the relative number aged 50 and over remained the same in the EU15 while increasing significantly in the new Member States. The proportion of metal moulders and tool makers of 50 and over, however, increased in the EU15 countries (by 2

percentage points) as well as in the new Member States, the increase being particularly large in the UK (8 percentage points in the case of metal moulders).

Table F Change in employment in automotive industry by age group, 1999-2000 to 2006-2007

		<i>Percentage point change</i>							Manufacturing	
		Automotive industry							EU15	NMS
		DE	FR	IT	SE	UK	EU15	NMS		
Managers	15-39	-1	22	8	26	-13	-3	8	-6	3
	40-49	-1	-6	9	-37	17	7	3	6	-8
	50+	2	-17	-17	10	-4	-4	-11	0	5
Professionals+technicians	15-39	-6	7	2	-5	4	-1	-2		
	40-49	5	-13	3	4	3	0	9		
	50+	0	6	-5	1	-7	1	-7		
Engineers	15-39	-6	6	-5	-6	6	-2	-2	-4	3
	40-49	6	-13	8	4	2	1	8	2	-4
	50+	0	7	-3	1	-8	1	-6	1	2
Computer specialists	15-39	2	16		-14	-22	7	-7	-3	6
	40-49	-3	-12		5	8	-9	14	4	-6
	50+	1	-4		9	14	1	-7	-1	1
Other professionals	15-39	-12	20	6	-18	-1	-4	23		
	40-49	3	-14	-6	17	4	0	-21		
	50+	9	-6	0	1	-3	4	-2		
Business, finance, sales	15-39	-21	19	-16	-21	-15	-13	5	-4	9
	40-49	9	-4	12	33	16	10	-1	4	-8
	50+	11	-14	4	-12	-1	3	-4	1	-1
Administrative+other	15-39	-9	23	15	-19	25	1	24	-3	14
	40-49	1	-20	-17	-14	-22	-5	-22	1	-16
	50+	8	-2	3	33	-3	4	-2	2	2
Office workers	15-39	-3	0	20	17	-14	1	-1	-6	4
	40-49	3	-9	-1	-4	-8	-1	-9	2	-8
	50+	0	9	-19	-13	22	0	10	4	4
Skilled manual workers	15-39	-6	5	-1	0	-8	-3	-3		
	40-49	4	-7	5	6	7	2	-5		
	50+	2	3	-4	-6	1	0	8		
Metal moulders	15-39	-14	-10	4	2	-16	-7	-14	-7	-14
	40-49	9	7	-1	7	8	5	8	4	5
	50+	5	4	-2	-10	8	2	7	3	10
Tool makers	15-39	-9	4	-1		-11	-5	-8	-5	-4
	40-49	6	-7	2		7	3	4	2	-3
	50+	3	3	-1		4	2	4	4	8
Mechanics	15-39	-1	7	-2	-8	1	2	-5	-3	-3
	40-49	-1	-14	4	3	4	-1	2	1	-3
	50+	2	7	-2	4	-4	0	4	2	6
Electricians+others	15-39	-4	2			-13	-3	3	-8	-3
	40-49	4	-4			12	4	-15	4	-6
	50+	-1	2			1	-1	13	4	9
Semi-skilled	15-39	-14	7	5	-10	-7	-4	1		
	40-49	10	0	0	4	7	5	-4		
	50+	4	-7	-5	6	0	-1	3		
Production line	15-39	-15	4	4	-9	-7	-4	0	-7	-1
	40-49	12	2	0	4	7	5	-4	4	-6
	50+	3	-6	-4	5	0	-1	4	3	6
Drivers	15-39	-10				-3	2	9	-5	3
	40-49	5				7	0	-2	3	-7
	50+	6				-4	-2	-7	2	4
Low skilled	15-39	-6	-12	1		-4	-8	0	-7	4
	40-49	6	-3	6		13	9	-3	4	-5
	50+	0	15	-8		-8	-1	3	3	1

Note: The changes give an indication of the changes over this period but because of the sample nature of the data, they should not be regarded as being precise.

Among semi-skilled manual workers, there was a slight decline in the proportion in the older age group in the EU15 and an increase in the new Member States.

There is, therefore, a growing proportion of those employed in specialist professional jobs as well as in many of the skilled manual jobs in the automotive industry in the EU15 who are in their 50s and older, which could give rise to problems of skill shortages, or at least recruitment difficulties, over the next few years.

The division of employment between men and women

One possible means of overcoming potential problems of skill shortage would be to recruit more women into the automotive industry. There is, however, little evidence that this is happening.

Men dominate employment in the automotive industry even more than in manufacturing as a whole. This is the case for all jobs except for some administrative positions and secretarial and clerical work. Nor is there much sign of the situation changing significantly over time.

In 2007, 90% of the managers and directors in the automotive industry in the EU15 were men and 97% of production managers, in both cases more than in other parts of manufacturing. The only countries in which men filled less than 90% of managerial positions in the industry are Belgium (76%), Germany (87%) and the UK (89%), though only marginally in the case of the last two (Table G). In the new Member States, the gender imbalance is even more extreme, with all managers and directors being men in all of the countries, except Hungary and Romania (90% in each), while, in other parts of manufacturing, there are at least some women in such positions.

A similar imbalance exists among engineers, 94% of those employed in the automotive industry in the EU15 being men and though the proportion is slightly less in some countries (especially the Portugal, Sweden, the Czech Republic and Slovenia), it is below 80% only in Romania. Much the same is the case for computer specialists, 89% of whom are men in the EU15, almost the same as in the rest of manufacturing, and for which there are only three countries in the EU as a whole – the Czech Republic, Italy and Portugal – where women account for over 20% of those employed.

Among professionals in business, finance and sales, there are both more women employed and a bigger difference in the situation across the EU. On average, women accounted for 29% of all those employed in such jobs in the automotive industry in the EU15 in 2007 – still less than in the rest of manufacturing – though in France, the proportion was over 40%, in Sweden, it was close to half and in Austria, slightly over half. In the new Member States, moreover, more women were employed in these types of job than men on average (though the numbers involved tend to be very small).

Women made up an even larger proportion of those employed in administrative and other specialist professional positions (including in human resource departments), just as in the rest of manufacturing, accounting for 44% of the total in the EU15, while in France and Portugal, they were in a large majority. The same was the case in the new Member States, where women filled around two-thirds of the jobs on average in 2007.

Women also accounted for two-thirds of those employed in secretarial and clerical jobs in the new Member States, while, in the EU15 countries, they made up over half of those working in such jobs, though this was less than in other parts of manufacturing, where women account for over 60% of those employed. The division of sales and service jobs in the industry is relatively evenly split between men and women in the EU15, though the numbers involved are very small and even smaller in the new Member States.

Almost all skilled manual workers in the automotive industry are men, particularly those employed as tool makers or mechanics, which is similar to the situation in manufacturing as a whole. This is less the case in Portugal and Romania, though in both cases, the number of such jobs is relatively small.

Table G Employment in automotive industry by sex, 2007

		<i>% of total employed in each occupation in sector</i>							Manufacturing	
		Automotive industry							EU15	NMS
		DE	FR	IT	SE	UK	EU15	NMS	EU15	NMS
Managers	Men	87	91	91	90	89	90	95	79	80
	Women	13	9	9	10	11	10	5	21	20
Production	Men	98	100	100	92	96	97	96	87	80
	Women	2 -	-		8	4	3	4	13	20
Other	Men	81	88	89	87	85	86	94	75	79
	Women	19	12	11	13	15	14	6	25	21
Professionals	Men	94	92	96	84	94	93	81		
	Women	6	8	4	16	6	7	19		
Engineers	Men	95	91	99	82	95	94	83	88	78
	Women	5	9	1	18	5	6	17	12	22
Computer specialists	Men	85	100	72	100	88	89	71	88	72
	Women	15 -		28 -		12	11	29	12	28
Other professionals	Men	65	38	58	55	55	61	37		
	Women	35	62	42	45	45	39	63		
Business, finance, sales	Men	76	58	73	51	49	71	49	64	48
Aministrative+ other	Men	24	42	27	49	51	29	51	36	52
	Women	57	29	51	61	71	56	34	50	34
	Women	43	71	49	39	29	44	66	50	66
Office workers	Men	42	55	55	52	37	46	33	38	36
	Women	58	45	45	48	63	54	67	62	64
Sales+service workers	Men	48	64	35	100	100	51	60	25	52
	Women	52	36	65	-	-	49	40	75	48
Skilled manual workers	Men	94	88	89	88	98	93	86		
	Women	6	12	11	12	2	7	14		
Metal moulders	Men	96	100	94	97	98	96	91	97	93
	Women	4 -		6	3	2	4	9	3	7
Tool makers	Men	99	100	91	79	100	98	85	96	90
	Women	1 -		9	21 -		2	15	4	10
Mechanics	Men	97	89	89	84	97	95	87	97	94
	Women	3	11	11	16	3	5	13	3	6
Electricians+ others	Men	85	79	83	93	100	86	77	76	52
	Women	15	21	17	7 -		14	23	24	48
Semi-skilled workers	Men	82	81	85	78	84	82	52		
	Women	18	19	15	22	16	18	48		
Production line	Men	79	79	85	76	82	80	49	74	47
	Women	21	21	15	24	18	20	51	26	53
Drivers	Men	96	89	100	96	96	94	87	97	93
	Women	4	11 -		4	4	6	13	3	7
Low skilled	Men	80	61	58	62	91	76	52	61	55
	Women	20	39	42	38	9	24	48	39	45

Men also make up the great majority of semi-skilled manual workers in the industry in the EU15, again more so than in the rest of manufacturing, filling some 80% of jobs for machine operators or on the production line, though much less so in Portugal (39% of workers being women) than in the other countries. By contrast, in the new Member States, such jobs are relatively evenly split between men and women, with more women than men being employed in the Czech Republic and Romania.

Finally, in most countries men also account for the majority of low skilled workers, employed as labourers, cleaners, canteen assistants and so on, and where they do not or where there is a

relatively even split between men and women, the overall numbers concerned are in most cases very small. In other parts of manufacturing, women tend to make up a larger proportion of low skilled workers than in the automotive industry, perhaps reflecting the larger number of jobs entailing heavy work.

Changes in the division of jobs between men and women

There has been relatively little change in the division of employment between men and women in most types of job in the automotive industry over recent years.

Among managers and directors, the proportion of men in the industry, which was already very high, increased further over the 7 years 1999-2000 to 2006-2007, if only slightly in the EU15, though more in the new Member States (Table H). This contrasts with the small increase in the number of women relative to men in such position in the rest of manufacturing in the EU15 and the unchanged split between the two in the new Member States.

Table H Change in share of jobs filled by men in the automotive industry, 1999-2000 to 2006-2007

	<i>Percentage point change</i>							<i>Percentage point change</i>	
	Automotive industry							Manufacturing	
	DE	FR	IT	SE	UK	EU15	NMS	EU15	NMS
Managers	-2	28	-13	6	0	2	14	-3	0
Production	8	32	0	13	-1	6	7	-3	-1
Other	-9	26	-15	35	3	2	13	-2	0
Professionals	1	-2	0	-1	1	0	-4	0	0
Engineers	1	-3	2	-4	0	-1	-2	-1	-3
Computer specialists	3	9	-19	27	9	3	-17	1	-7
Other professionals	0	-20	-12	-29	-5	-6	-18	0	0
Business, finance, sales	-7	2	-11	-29	-3	-6	-15	-6	-4
Administrative+other	1	-29	-9	-31	-2	-6	-20	-2	-14
Office workers	1	0	-5	10	-2	-1	6	-1	7
Skilled manual workers	2	-4	-1	-5	4	0	0	0	0
Metal moulders	2	1	4	17	0	2	-5	2	2
Tool makers	2	3	-8	-16	1	1	-6	1	-3
Mechanics	1	-3	-4	-12	3	0	-8	1	-3
Electricians+others	1	-8	3	-7	13	0	-2	3	-5
Semi-skilled workers	1	2	-1	0	3	0	-8	0	0
Production line	1	1	-1	-1	2	-1	-8	2	-4
Drivers	2	-3	7	16	3	0	0	0	2
Low skilled workers	7	-9	-12	10	-2	-1	2	1	3

Note: The changes give an indication of the changes over this period but because of the sample nature of the data, they should not be regarded as being precise.

Among professionals and technicians, there was a marginal increase in the proportion of women employed in the automotive industry in the EU15, though this was concentrated among business, finance, sales, administrative and similar kinds of specialists and there was little change in the male dominance of engineering jobs, while the proportion of women employed as computer specialists declined slightly. The same was also the case in the rest of manufacturing. In the new Member States, the data indicate more of a shift from men to women, though in many cases the numbers involved are too small to give a reliable indication of the scale of the change.

Among secretarial and clerical workers, the number of women employed in the industry, as in manufacturing as a whole, increased marginally in the EU15, while in the new Member States, by contrast, the number of men employed rose by more than the number of women.

Among skilled manual workers, the proportion of men increased relative to women in jobs for tool-makers and mechanics in the EU15 but declined in other kinds of job. In the new

Member States, there was relative increase in the number of women employed in most types of job, as there was in the rest of manufacturing both in these countries and in the EU15, though this may reflect in some degree the change in the composition of the sector, with some shift away from heavy industry.

Among semi-skilled manual workers, there was relatively little change in the division of jobs between men and women in the EU15, in contrast to the new Member States, where the relative number of women employed increased both in the automotive industry and in manufacturing as a whole. There was also little change in the EU15 in the division of low skilled jobs between men and women in the automotive industry as in the rest of manufacturing, though there were marked differences in the pattern of change across Member States. There were more countries, however, in which the number of women increased in relation to men than the reverse – Germany being one of the latter.