

The value added by branch in the European Union

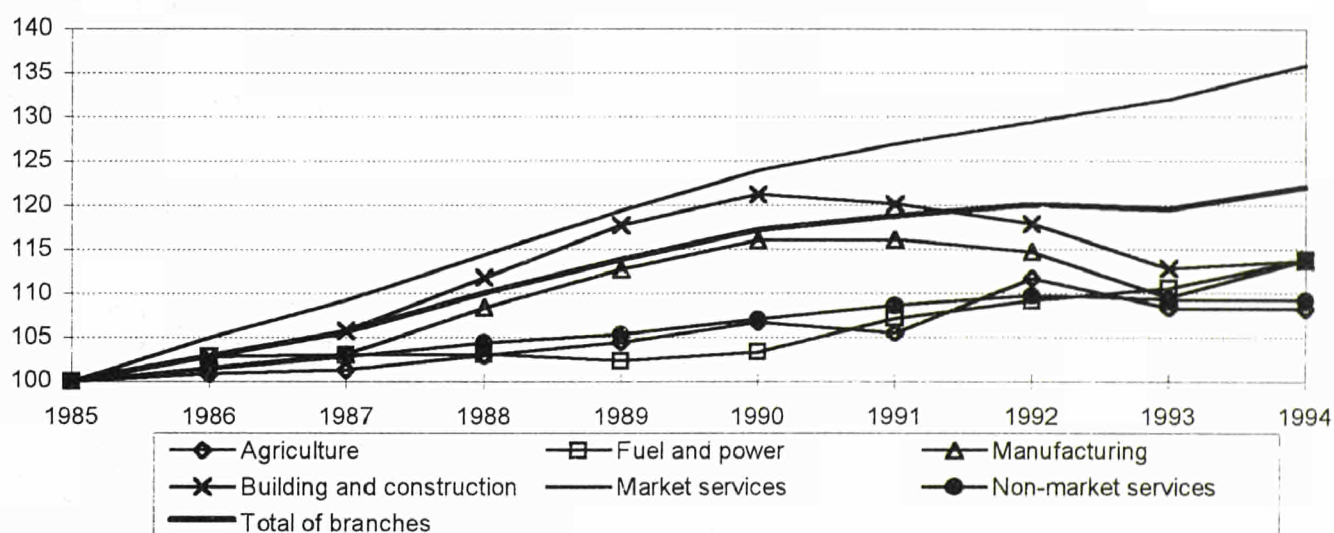
- Results for 1994 -

Gross domestic product in accordance with the production side is obtained by adding together the value added of the individual branches of activity plus non-deductible VAT and net taxes linked to imports (see definitions in the box on page 2). Eurostat has a detailed database by branch¹, in particular as far as the value added is concerned, that allows to study the structure of value added and its evolution.

This analysis focuses the relations between the values of the gross value added at market prices (VABmp) by branch, branch group or/and the total of branches. The main aspects of this analysis for the Member States and the European Union are shown below.



Figure 1: GVAmP* volume index by branch group, 1985=100



* prices and exchange rates of 1990, see note to table 1

¹: Data base SEC 2, Publication : Eurostat National Accounts - Detailed Tables by Branch 1970-94, Theme 2, Series C, Brussels/Luxembourg, to be published shortly.

Trends in gross value added by branch group

Gross domestic product at market prices represents the final result of the production activity of resident producer units. It corresponds to the economy's total output of goods and services less intermediate consumption, plus VAT on products and net taxes on imports excluding VAT.

Gross domestic product at market prices is equal to the sum of gross value added at market prices of all the different branches, plus VAT on products and net taxes on imports excluding VAT.

For each branch, the **gross value added** at market prices is the difference between the value of its actual output and the value of its intermediate consumption. It can be recorded exclusive or inclusive of value added tax (VAT). The net system (exclusive) has been chosen as the community standard.

The "*imputed output of bank services*" is recorded separately. It represents the output produced by credit institutions in their capacity as financial intermediaries. It is measured conventionally by taking the difference between the credit institutions' property income (other than that accruing from investment of their equity capital) and the amount of interest they pay to their creditors.

However, the output of credit institutions also includes other market services such as the regular execution of banker's orders, the management of stocks and shares for third parties, the hire of safe-deposit boxes, etc. The value of these services is measured directly by taking the amount which the customers pay for them to the credit institutions.

It is not possible to identify which groups use the imputed output of bank services, and at present it is virtually impossible to determine the criteria for breaking down use of these services between the various client units.

The imputed output of bank services is therefore considered to be destined, as a whole, for intermediate consumption by a special unit. This unit has zero output, an intermediate consumption equal to the imputed output of bank services and a value added which is equal to this imputed output, but with the opposite sign.

In this way, the value of the imputed output of bank services is deducted from the value added for all branches to obtain the overall value added for the economy. Without this measure the overall value added of the economy would be overestimated.

A comparison of the trends in GVA_{mp} by branch group in real terms since 1985 (*Figure 1, Table 1*) shows first of all the exceptional position of market services, which had a rate of growth over the whole period some three or four times that of the other branch groups. In addition the growth rate shows a steadily increasing lead over the rest of the economy during the period, and the strength of this trend was also scarcely affected by the decline in total value added in the Union in 1993.


Two other branch groups, manufacturing and building and construction, show rates of growth for the second half of the 1980s which are relatively close to the overall rate, whereas agriculture, fuel and power and non-market services were already falling well behind.

While the energy producers continued to achieve substantial increases in their GVA_{mp} between 1990 and 1994 and for non-market services and agriculture there were relatively small declines in 1993 and 1994 following a period of growth, manufacturing and building and construction suffered drastic falls in GVA_{mp} in 1992 and 1993.

This meant that by 1993 GVA_{mp} had fallen back almost to its 1988 level in the construction industry and in manufacturing. The subsequent recovery in 1994 turned out to be comparatively weak for building and construction, while manufacturing recorded the strongest growth of any branch group or year in the observation period. Together with the energy producers, whose GVA_{mp} , after rising steadily from 1990 onwards, saw a further increase in its rate of growth, manufacturing and building and construction achieved practically identical index levels in 1994. These levels are some 14% in real terms above those of 1985, which represents only about two thirds of the growth in the economy as a whole up to 1994 or less than half the growth in market services.

With gross value added in 1994 8% and 9% respectively above the 1985 levels in real terms, agriculture and non-market services are well behind the other branch groups but still make a not inconsiderable - though disproportionately small - contribution to the increase of 22% in the Union's economic performance between 1985 and 1994.

**Table 1: GVAm_p by branch group in the European Union*,
in bn ECU at 1990 prices and exchange rates**

	Agriculture	Fuel and power	Manufacturing	Building and construction	Market services	Non-market services	Total**
1985	123.8	209.3	959.4	240.2	1807.7	635.2	3988.4
1986	124.9	215.3	974.1	247.0	1898.1	644.1	4100.8
1987	125.4	215.5	989.0	254.1	1973.6	653.0	4211.6
1988	127.4	215.8	1039.6	268.6	2066.9	663.3	4386.2
1989	129.3	214.2	1081.7	282.9	2157.4	669.0	4536.3
1990	132.1	216.2	1112.5	291.4	2239.4	679.8	4669.6
1991	130.7	224.2	1113.6	288.6	2294.9	689.9	4737.8
1992	138.3	228.4	1100.4	283.3	2340.4	697.1	4784.1
1993	134.1	231.5	1051.3	271.0	2385.8	693.9	4762.9
1994	134.0	238.2	1091.7	273.1	2456.0	693.8	4867.8

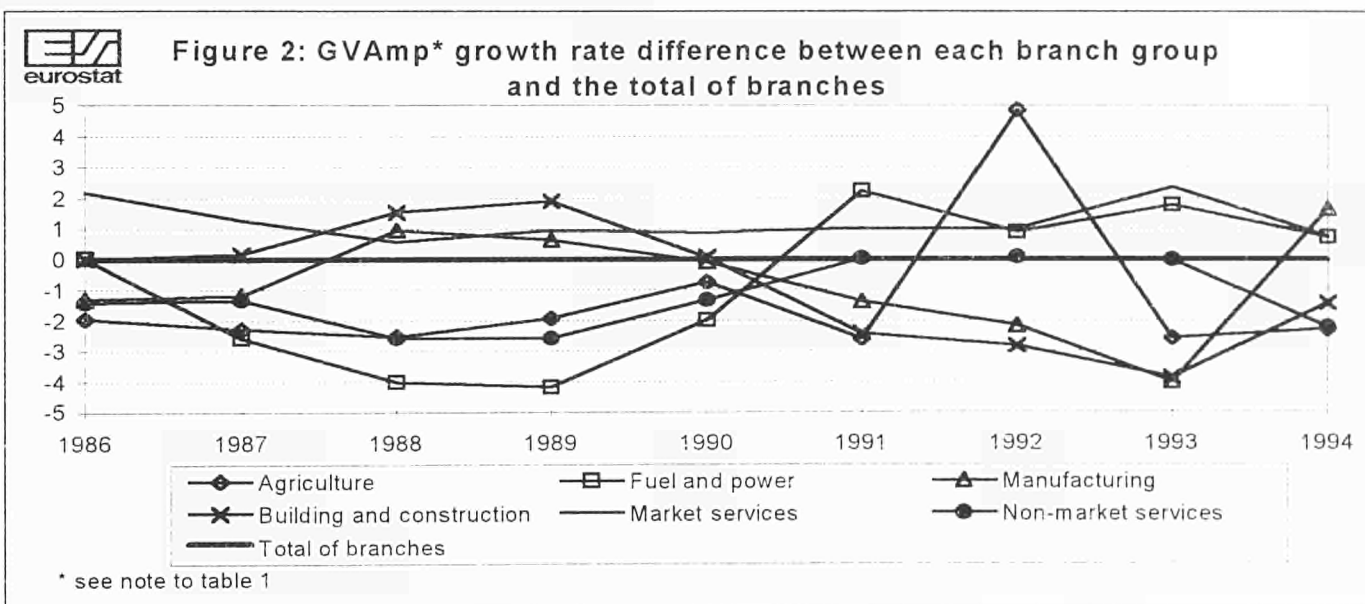
* without GR, IRL, L, P, S. Data for Austria in 1985-88 for market services are estimated.

** includes the statistical difference between the GVAm_p of the entire economy and the total of branch groups.

The pattern of growth by branch group

The above observations have already brought out the fact that while the trend in GVAm_p was still comparatively homogeneous across the branch groups in the second half of the 1980s, this was followed by widely divergent patterns in the first half of the 1990s. In order to get a better idea of the differences in growth patterns, the best approach is to relate the growth rates in the various branch groups to

those for the economy as a whole in the Union. If this is done on the basis of the absolute difference in growth rates (Figure 2, Table 1) it emerges that of the three branch groups (manufacturing, building and construction and market services) which had above-average growth rates in the second half of the 1980s, only market services maintained this position.



The GVAm_p of the fuel and power branch group, on the other hand, where the rate of growth at first lagged behind the general trend, saw a much stronger than average growth from 1991 to 1994, with growth rates approaching or even exceeding those for market services. These two branch groups with particularly dynamic growth were joined again in 1994 by manufacturing, where the rate of growth relative to the economy as a whole had become progressively worse over the previous five years. Building and construction, on the other hand, while seeing

a strong recovery in 1994 after four years of falling further and further behind, was not yet able to catch up with the growth rate of the economy as a whole.

Growth in agriculture regularly lags behind the overall trend by one or two percentage points, with the exception of 1992, where it was ahead by a substantial margin of nearly 5%. After rising at a below-average rate up to 1990, the value added in non-market services grew at a rate close to the average in the following three years but then fell back in 1994 to a position similar to that of 1988 and 1989.

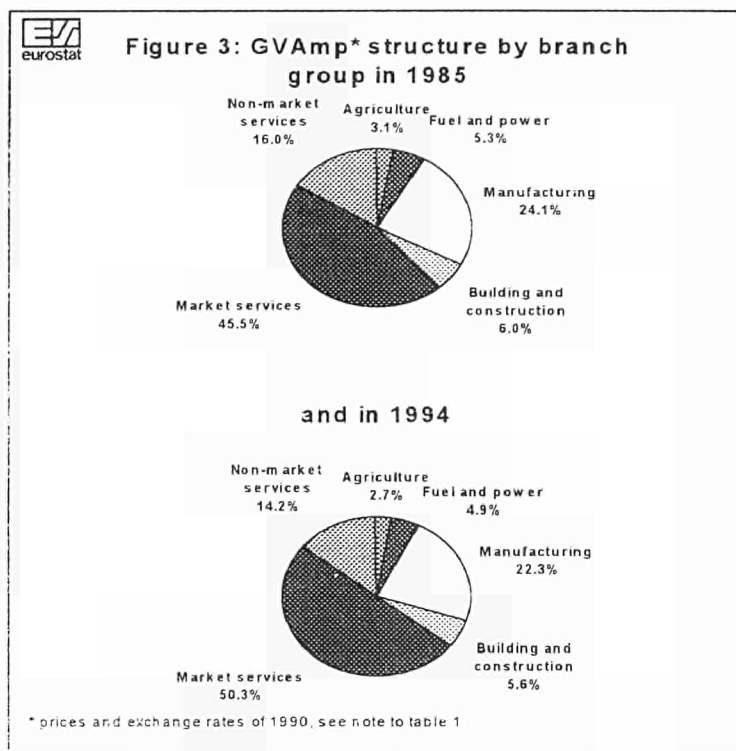
If the homogeneousness/heterogeneousness of the growth patterns by branch group is measured using the mean absolute deviation of growth rates from the average, a value of 1.2% is obtained for 1986, rising at first to 1.5% for 1987 and around 2% for each of the next two years. The drastic drop in the average deviation to 0.9% for 1990 shows the most homogeneous rate of growth across the branch groups of the

whole period under review. For the next three years there was again an increasing spread of growth rates, reaching the most divergent pattern of the period in 1993 with a mean deviation of 2.4%. Showing a mean deviation of 1.5%, the recovery of 1994 was not as evenly spread over the branch groups as in 1990 but showed a similar level of homogeneousness as in 1987 and 1991.

Changes in the structure of value added by branch group

The structural shift caused by variations in the strength of growth in the branch groups results from the fact that if the GVA_{mp} of one branch group grows faster (slower) than that of the economy as a whole its share of total value added increases (decreases). The corresponding structural shift between 1985 and 1994 is shown in *Figure 3* (see the methodological remarks concerning the illustration of structural shifts in the box on page 8).

The structural expansion of market services from 1985 to 1994 amounts to some five percentage points, mainly fuelled by drops of around 1.7% in each case in manufacturing and non-market services. For the three other goods-producing branch groups the changes in share are relatively modest in absolute terms (agriculture -0.36%, fuel and power -0.37% and building and construction -0.43%) but are quite substantial relative to share size.



The dynamic upturn in gross value added in manufacturing in 1994: which were the main branches responsible?

The strong growth in GVA_{mp} in manufacturing in the Union in 1994, which meant a return to levels close to the peaks of 1990 and 1991 after two years of sharp decline, is an interesting case for a structural analysis by branch. Data on GVA_{mp} in 1994 by branch are available, however, only for Belgium, Denmark, France, Italy, the Netherlands, Austria, Finland and the United Kingdom, which means that the relevant structural information can be extracted for nearly two thirds of the total value added in manufacturing in the Union.

Since the dynamism of gross value added in manufacturing, while it indeed depends on the growth in the individual branches, is also related to the relative weight of these branches in the branch group *Figure 4* shows the shares of the individual branches for 1994. They range from 3.8% for office and data-processing machines and precision and optical instruments to 15% for food, beverages and tobacco. After chemicals with 10.6%, there are six branches

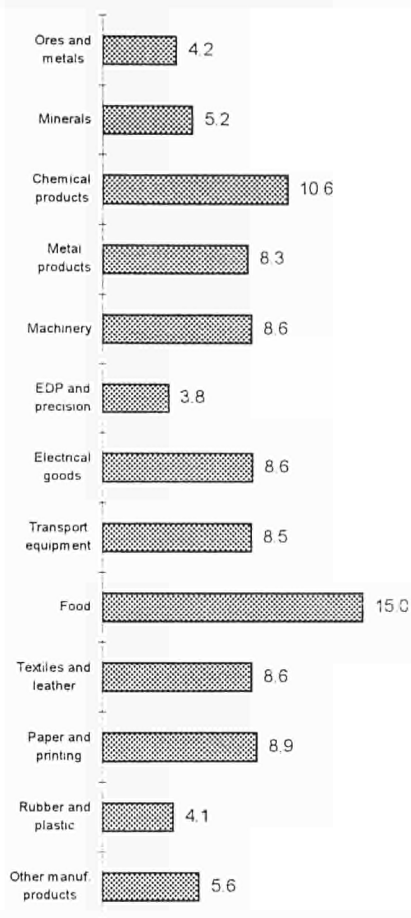
with shares of between 8% and 9% and four branches between 4% and 6%.

If we look at growth in manufacturing in 1994 by Member State (*Figure 5, Table 2*), we find rates ranging from 1.7% in Denmark to 11.5% in Finland. Apart from Germany and France with 2.3% and 3.5% respectively, in the six other Member States covered GVA_{mp} in manufacturing grew by between 4% and 5.3%.

The growth rate by branch for the Member States covered in each case (*Table 2*) ranged from 0.8% for food, beverages and tobacco to 15.3% for office and data processing machines and precision and optical instruments. This means that for 1994 the branch with the largest (smallest) share of total GVA_{mp} in manufacturing had respectively the smallest and largest growth rate.

Ferrous and non-ferrous metals, chemicals, metal products, machinery, electrical goods, transport

Figure 4: Portion of each manufacturing branch in the GVAm^p of total manufacturing in 1994 in the European Union*, as a %



* without D, E, GR, IRL, L, P, S, computed from data in 1990 prices and exchange rates

and leather branch, and in four of these cases the drop of less than 1% is relatively minor.

With growth rates of more than 10% (Figure 6), seven branches are found to be particularly dynamic in individual Member States: ferrous and non-ferrous metals in Denmark and Finland, minerals and mineral products in the Netherlands, agricultural and industrial machinery in Finland, office and data processing machines and precision and optical instruments in Italy and the United Kingdom, transport equipment and other manufactured products in Finland and electrical goods in the United Kingdom.

Growth rates of between 8 and 10% for 1994 are found for ferrous and non-ferrous metals in Austria, the chemical industry in Belgium, Italy and Finland, metal products in Finland, office and data processing machines and precision and optical instruments in Denmark and the Netherlands, transport equipment in Italy and rubber and plastic products in Finland and the United Kingdom.

If the homogeneousness across the various Member States of trends in 1994 by branch is measured using the mean deviation, the variations in growth are found to be smallest for food, beverages and tobacco (1.4%) and largest for office and data processing machines and precision and optical instruments (7.9%). The branches with the least and most dynamic growth are thus those which expanded respectively most homogeneously and most heterogeneously in the Member States.

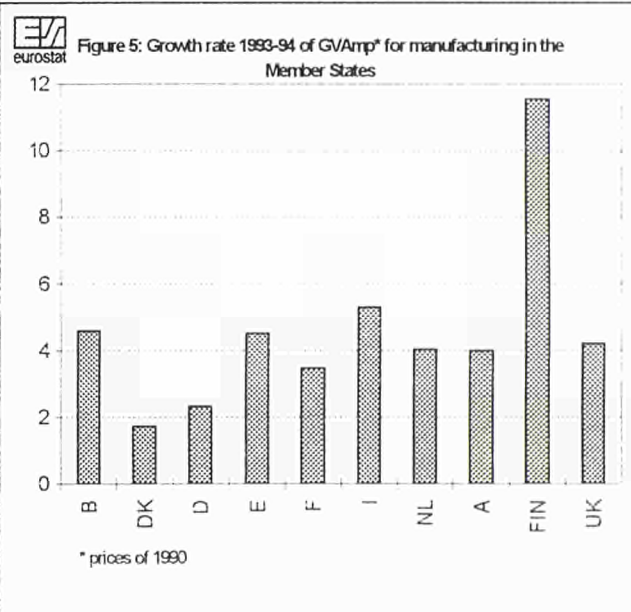
This is not, however, a relationship which holds generally, since three of the branches where

equipment and rubber and plastic products constitute six further branches with high rates of expansion of around 6%, and five of these are among the major branches with shares of more than 8% of total GVAm^p for manufactured products.

With growth of around 3 to 4%, the pattern for mineral products, the textiles and leather branch, paper and printing products and other manufactured products may appear modest compared with the other branches, but growth is nonetheless at a high level in relation to the economy as a whole.

Growth rates for 1994 in the manufactured products branches in the Member States covered (Table 2) are very largely positive, and in only five branches are there one or more cases of a decline in GVAm^p. The range is from -14% for the transport equipment branch in Denmark to almost +26% for office and data-processing machines and precision and optical instruments in the United Kingdom.

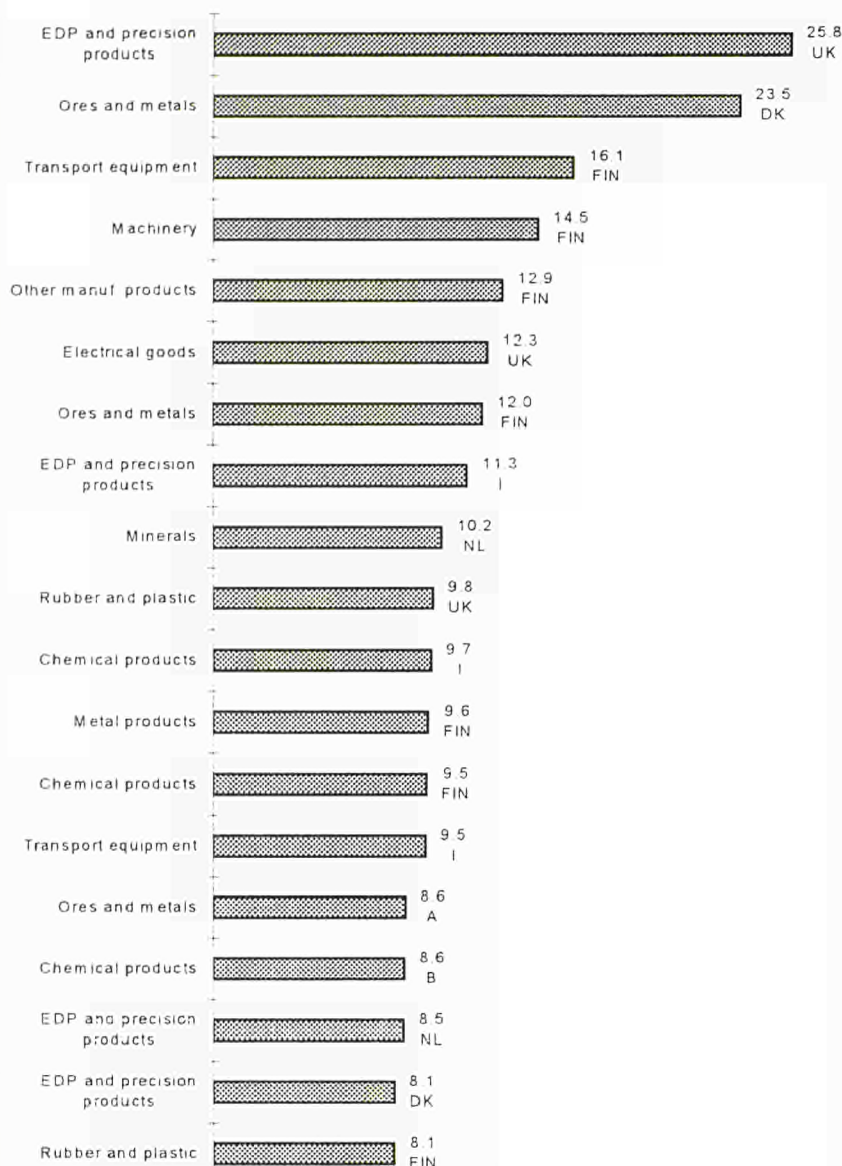
Apart from three cases - other manufactured products in Belgium and mineral products and transport equipment in Denmark - declining GVAm^p affects only food, beverages and tobacco and the textiles



* prices of 1990

growth is relatively slack (minerals and mineral products, textiles and leather and other manufactured products) developed relatively heterogeneously, with mean deviations in growth rates of between 3% and 4%, and some branches with high growth rates

Figure 6: GVAmP* growth rate 1994-93 by manufacturing branch and by Member State, as a %



* prices of 1990

(chemicals, metal products, electrical products and rubber and plastic products) were more homogeneous with mean deviations of around 2 to 2.5%.

Above-average differences in growth rates from one Member State to another also coincided with highly dynamic growth in the production of ferrous and non-ferrous metals and of transport equipment, with mean deviations in growth rates of 4% and 5% respectively. In the paper and printing products branch below-average growth coincides with comparatively homogeneous growth rates across the Member States, the mean deviation being 1.5%.

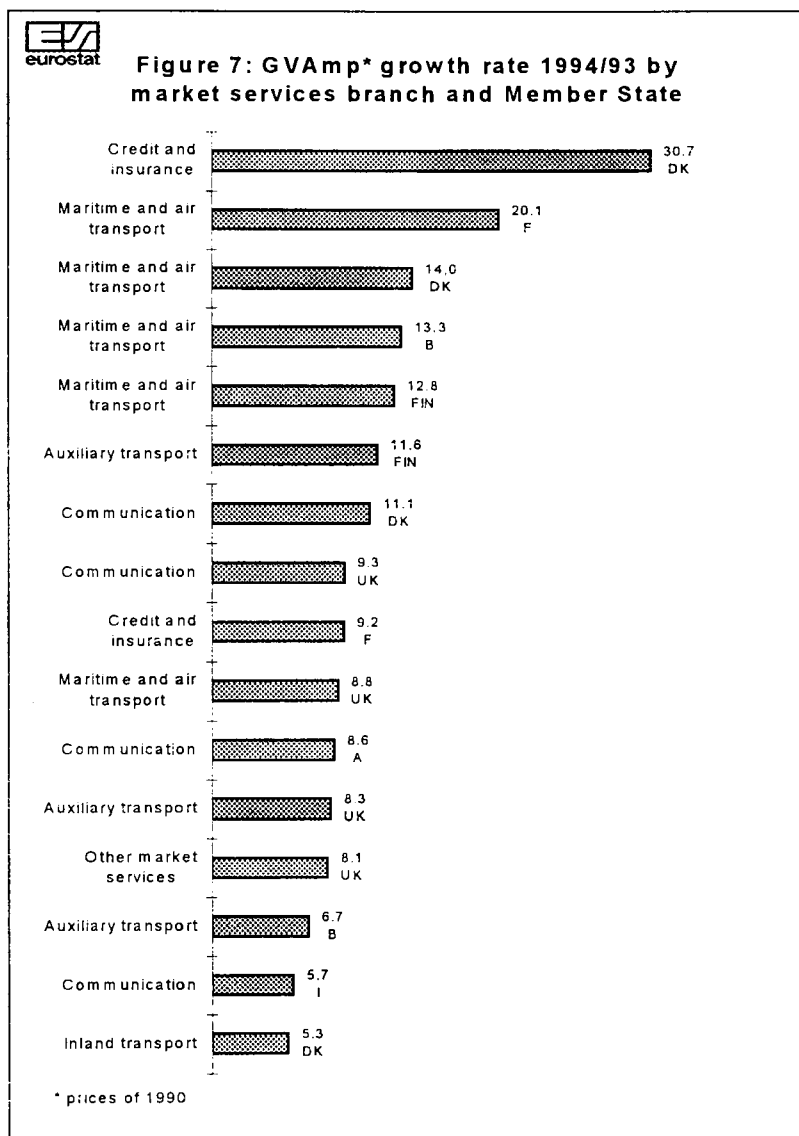
If the growth rates across the branches for 1994 are examined by Member State, the mean deviation gives indications of whether the recovery extended homogeneously to all branches or whether a small number of branches were responsible for most of the growth. With a mean deviation of 1.9%, the pattern of development in the manufactured products branches was most homogeneous in 1994 in France, while it was most heterogeneous in Denmark with a mean deviation of 6.0%.

For the United Kingdom and Finland the mean deviations in growth rates of 4% and 3.7% respectively indicate a structure of growth in GVAmP in which a few branches acted as powerhouses while the others recorded only comparatively modest growth. With mean deviations of 2.2%, 2.3%, 2.6% and 2.9% respectively, growth in manufacturing in Belgium, the Netherlands, Italy and Austria, on the other hand was spread fairly evenly over the individual branches.

Table 2: GVAmP growth rate 1993-94 by manufacturing branch in the Member States, based on data in prices of 1990

	B	DK	D	E	F	I	NL	A	FIN	UK	European Union	
Ores and metals	6.6	23.5	:	:	6.2	7.8	5.9	8.6	12.0	2.0	6.2	EUR8
Minerals	4.9	-2.8	:	:	5.4	1.8	10.2	5.8	7.9	4.2	4.0	EUR8
Chemical products	8.6	6.4	:	:	2.5	9.7	6.6	4.2	9.5	4.4	5.8	EUR8
Metal products	4.1	1.6	:	:	6.8	6.1	2.5	4.7	9.6	2.9	5.3	EUR8
Machinery	1.9	7.0	:	:	2.1	7.2	3.2	7.5	14.5	6.6	5.9	EUR8
EDP and precision products	5.7	8.1	:	:	5.7	11.3	8.5	:	:	25.8	15.3	EUR6
Electrical goods	5.4	2.0	:	:	3.2	5.2	3.7	5.1	:	12.3	5.6	EUR7
Transport equipment	6.0	-14.2	:	:	7.0	9.5	4.1	7.0	16.1	3.3	6.1	EUR8
Food	2.0	-2.7	:	:	0.5	-0.8	3.4	0.7	0.0	1.9	0.8	EUR8
Textiles and leather	0.5	-0.7	:	:	-0.2	5.4	-1.8	-6.4	7.3	1.1	2.9	EUR8
Paper and printing products	4.6	5.5	:	:	3.0	2.9	3.0	6.1	7.5	2.5	3.4	EUR8
Rubber and plastic products	7.2	3.9	:	:	3.1	4.6	5.6	:	8.1	9.8	5.8	EUR7
Other manufactured products	-1.8	7.5	:	:	2.7	3.9	1.0	4.5	12.9	1.7	3.6	EUR8
Manufacturing	4.6	1.7	2.3	4.5	3.5	5.3	4.0	4.0	11.5	4.2	3.8	EUR10

Market services: strong growth in the transport and communications branches



and the United Kingdom (6.3%) the rates were well above the average. For the Member States covered in each case, the growth in GVAm^p by branch was between 1.8% for lodging and catering and over 11% in the sea and air transport branch. Growth was above average in another transport branch, auxiliary services, at 5.2% and in communications services at 4.5%.

The GVAm^p growth rates for market services by Member State range from -9% in credit and insurance services in Finland to nearly +31% for the same branch in Denmark. With rates of between 10 and 20%, maritime and air transport services in Belgium, Denmark, France and Finland, auxiliary transport services in Finland and communications services in Denmark increased their gross value added by much more than the average (Figure 7).

These were followed, with growth of from 8 to 10%, by credit and insurance services in France, communications services in Austria and four branches in the United Kingdom - maritime and air transport, auxiliary transport services, communications and other market services. Apart from credit and insurance services in Italy, the Netherlands, Austria and Finland, there was a decline in GVAm^p in 1994 in only five cases, and in only three of these was the drop more than 1%: wholesale and retail trade services in Belgium (-1.1%), lodging and catering services (-1.2%) and auxiliary transport services (-4.9%) in Denmark.

The growth of just under 3% in GVAm^p of market services in 1994 for the ten Member States covered (Table 3) is the result of a relatively homogeneous trend, with the growth rate between 2% and 3% in seven Member States. With growth of 1.4%, Italy is somewhat below this level, while for Denmark (4.6%)

If the homogeneity of growth rates in 1994 over the market services branches is measured using the mean deviation, the trend in these branches was particularly homogeneous in the Netherlands and Austria (1.5% and 1.4% respectively) while with a mean deviation of 8% the variations in Denmark were particularly marked.

Table 3: GVAm^p growth rate 1993-94 by market services branch in the Member States, based on data in prices of 1990

	B	DK	D	E	F	I	NL	A	FIN	UK	European Union	
Trade	-1.1	3.2	:	:	0.8	2.5	0.8	2.5	4.2	3.9	2.0	EUR8
Lodging and catering services	3.0	-1.2	:	:	0.9	1.5	2.3	-0.8	3.0	3.9	1.8	EUR8
Inland transport services	0.0	5.3	:	:	2.0	4.4	:	3.1	1.6	3.7	3.2	EUR7
Maritime and air transport services	13.3	14.0	:	:	20.1	5.2	:	:	12.8	8.8	11.1	EUR6
Auxiliary transport services	6.7	-4.9	:	:	3.0	3.1	:	:	11.6	8.3	5.2	EUR6
Communication services	-0.6	11.1	:	:	0.0	5.7	0.6	8.6	2.9	9.3	4.5	EUR8
Credit and insurance	4.8	30.7	:	:	9.2	-4.3	-0.9	-1.1	-9.0	2.2	1.9	EUR8
Other market services	3.5	0.4	:	:	1.4	1.2	3.3	1.8	3.2	8.1	3.3	EUR8
Market services	2.4	4.6	2.7	2.6	2.1	1.4	2.3	2.6	2.4	6.3	2.9	EUR10

With 3.9% and 3.5% respectively, the mean deviations in France and Belgium were also quite substantial, whereas with mean deviations of from 2.5% to 2.9% growth in Italy, Finland and the United Kingdom was spread relatively evenly over the various branches.

There were comparatively homogeneous trends in 1994 in the branches trade, lodging and catering, inland transport and other market services in the

Member States covered, with the mean deviations in growth rates lying between 1.4% and 1.5%. The growth rates spread somewhat more heterogeneously across the Member States in communication services (3.3%), maritime and air transport (4%), and auxiliary transport services (4.3%). The differences in growth rates were greatest in the credit and insurance services branch, where the mean deviation was 6%.

In order to demonstrate the structural shift over a given period, usually the shares are calculated in current prices of the years concerned. However, if beneath the change in portions calculated in national currencies also the variation of the exchange rate affects the structural figures for a common economic area, then strong exchange rate variations could indicate structural shifts that have not taken place in the Member States.

Take for example two economic areas A and B, with determined portions of branch X in the gross value added of the total economies, where

$C_{A,B}$: national currencies of A and B

C_c : common currency unit

GVAt : gross value added of total economy

GVAX : gross value added of branch X

the effect might be illustrated as follows.

Assumed in the year t the GVAt in A and B is 100 C_A and 100 C_B respectively, GVAX is 10 C_A in A and 30 C_B in B and the exchange rates to the common currency unit C_c is 1:1 for C_A and C_B . For the portion of GVAX in GVAt figures are 10% in A, 30% in B and 20% in the common economic area of A and B ($[10C_c + 30C_c] / [100C_c + 100C_c]$).

Assuming all gross value added data in A and B for GVAt and GVAX rest unchanged in the year t+1, but the exchange rate of the national currency of B has changed to 2 C_B for 1 C_c . The portions of GVAX in GVAt in national currency still remain 10% in A and 30% in B. Although the portions in A and B have not changed, the portion for the common economic area of A and B indicates a structural shift, with a value of 16.7% ($[10C_c + 15C_c] / [100C_c + 50C_c]$).

In this report, therefore, the portions (*graphs 3 and 4*) were calculated on the basis of values in prices and exchange rates of 1990, because they are more suitable to indicate the structural shifts on the one hand, and maintain coherence with the data used for examining the volume developments on the other.