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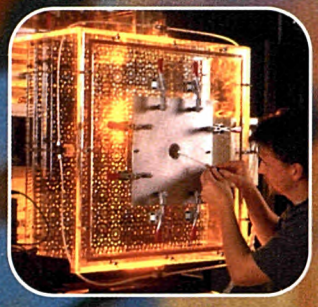
Monthly Panorama of European Industry



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ISSUE 4/97 ■ APRIL 1997

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Monthly Panorama of European Industry

ISSUE 4/97 ■ APRIL 1997

Theme
Energy and industry
4

Series
Short-term statistics
B

Sent to press in April 1997

A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server (http://europa.eu.int)

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Editorial

There are two supplementary articles in this edition. The first is a detailed account of the state of the European mechanical engineering industry. The article takes an in-depth look (at Nace 4-digit level) at the situation in the various activities. In 1996, mechanical engineering accounted for over 9 per cent of all manufacturing activity in the European Union. The article looks in particular at the competitive position of the European mechanical engineering industry and concludes that Europe's competitive edge has improved due to the adoption of superior technology, whilst it has been hindered by competition from low-cost price-orientated countries.

The second supplementary article in this issue focuses on the topic of sub-contracting in the EU. The article is an extract taken from the forthcoming publication, "New industrial sub-contracting in Europe": a joint publication to be released by Eurostat and DG XXIII. The article looks in particular at the sub-contracting phenomena in the aerospace industry. The article draws attention to the fact that the industry is characterised by global sourcing and that the vast majority of contracts are made in dollars. There appear to be two forms of sub-contracting in the industry: it is characterised predominantly by a pyramidal type of sub-contracting although there is also sub-contracting between aircraft manufacturers themselves. Sub-contracting in the industry is concentrated in very specific geographical locations.

May we also take this opportunity to remind readers that next month annual subscribers to the publication will receive the first of five special editions to be released. It will concentrate on the construction industry - an industry that accounts for some five to six per cent of economic activity within the EU. The edition should be released mid-May.

François de Geuser,
Luxembourg

Latest outlook - the most recent short-term indicators for European industry in tabular and graphic format, page 13.

In depth - a close look into the mechanical engineering industry, page 49.

Special focus - Analysis of sub-contracting in the European aeronautics industry, page 75.

Contents

The Monthly Panorama of European Industry has the objective of furnishing readers with an instrument which will allow them to follow the evolution of industrial short-term trends and also show the structure and activity of industry at the sectorial level. The publication appears eleven times during the course of the year. When the occasion warrants topical articles may well be treated in the form of a special edition, five of which are planned for 1997.

This publication is a joint project of Eurostat and Directorate General III (Industry policy).

The opinions expressed in this publication are those of the individual authors alone and do not necessarily reflect the position of the European Commission.

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Textiles and clothing

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Economic commentary

current economic situation in the EU, Japan and United States

Data in this section

index of production, consumer price index, trade balance

For full methodological notes and an explanation of the signs and abbreviations used in this publication, please refer to page 71

In this section:

The economy as a whole

The consumer price index of the EU was up 0.2% in January 1997 compared with December 1996 and up 2.2% compared with January 1996. Over the same period, the US price index moved by 0.1% and 3.0%. In Japan, prices remained unchanged between January 1996 and January 1997.

In February 1997, long-term interest rates stood at 5.8% in the United States, 3.1% in Japan and 7.5% for the EU, with individual rates (excluding Luxembourg and Greece) ranging between 6.2% in Germany and the Netherlands and 10.3% in Italy.

Industry as a whole

A comparison of the industrial production index for the quarter November 1996-January 1997 with that for the same quarter a year before reveals growth of 0.5% for the EU but of 1.7% for Germany, 1.1% for France and 1.3% for the United Kingdom. By contrast, the same comparison reveals falls in Italy and Portugal of -5.5% and -0.6% respectively. In Japan and the United States industrial production grew by 5.2% and 4.2% respectively.

Compared with the previous quarter, the index of industrial production for the quarter ending in January 1997 showed growth rates of 0.2% for the EU, -0.2% for France, -1.5% for Italy, 0.7% for Germany and 0.9% for the United Kingdom. The rates for Japan and the United States were 2.1% and 1.1% respectively.

Between January 1996 and January 1997, the index of industrial producer prices showed inflation of 0.8% for the EU, 0.7% in Germany and France, 0.6% in Italy, and 0.4% in the United Kingdom. By contrast, producer prices fell in Sweden (-0.3%) and Finland (-0.7%). In the United States producer prices rose by 2.7% while in Japan they fell by 0.4%.

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Industrial production in the EU rose by 0.5% between the quarter ending in January 1997 and the same quarter of the previous year

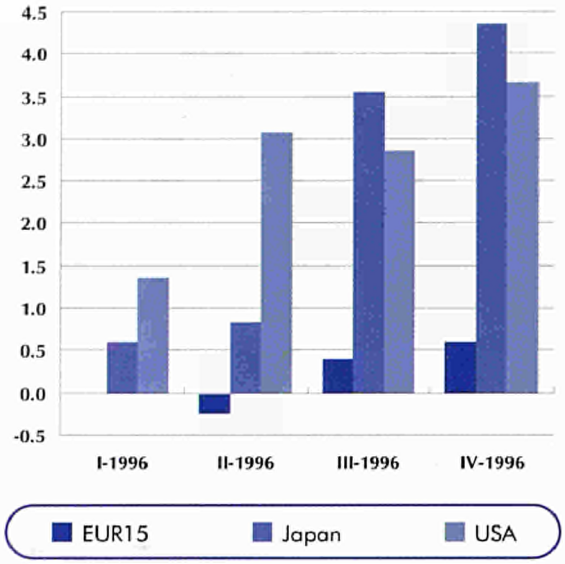


Figure 1.1

Year on year growth rates (t/t-4) for industrial production (%)

Source: eurostat

Situation in the various Member States

In Germany, GDP rose by 0.1% in the last quarter of 1996 over the growth rate of 0.7% in the third quarter, bringing the annual growth rate of GDP between the fourth quarters of 1995 and 1996 to 1.9%. Imports and exports also showed marked growth over the preceding quarter in the fourth quarter of 1996 as a result of the fall in the value of the mark and the renewed competitiveness of German products. Similarly, investment in capital goods rose 4.1% over the year as a whole, although consumption slowed somewhat from an annual growth rate of 2.5% in the third quarter to a rate of 1.4% in the fourth.

Industrial production, particularly construction, was adversely affected by the bad weather conditions in January 1997, although order books remained healthy thanks to demand from foreign countries. The cold snap also affected the consumer price index, which rose in annual terms by 1.8% in January 1997 compared with 1.4% the previous month. The situation on the labour market, having deteriorated in January, remained stable in February 1997 with an unemployment rate of 11.3%. Nevertheless, it is estimated that Germany lost half a million jobs in 1996, above all in manufacturing industry and the construction sector.

In Austria, the public deficit in 1996 was estimated at 3.9% of GDP by the Austrian Statistical Office, a marked improvement over the 5.3% recorded a year before. On the other hand, public debt rose over the same period from 69.3% to 70.1% of GDP.

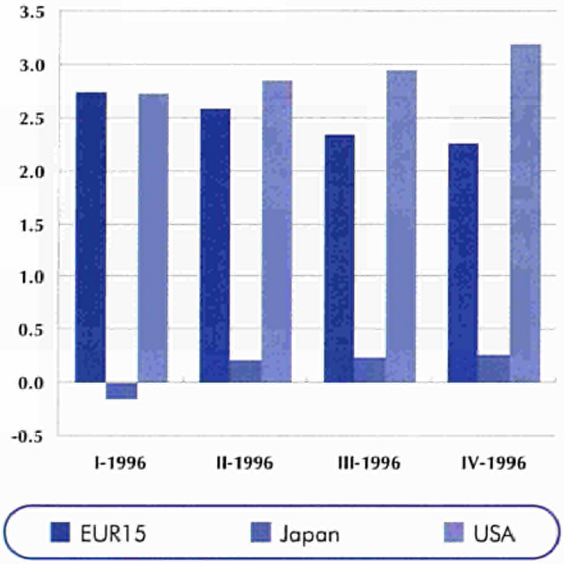


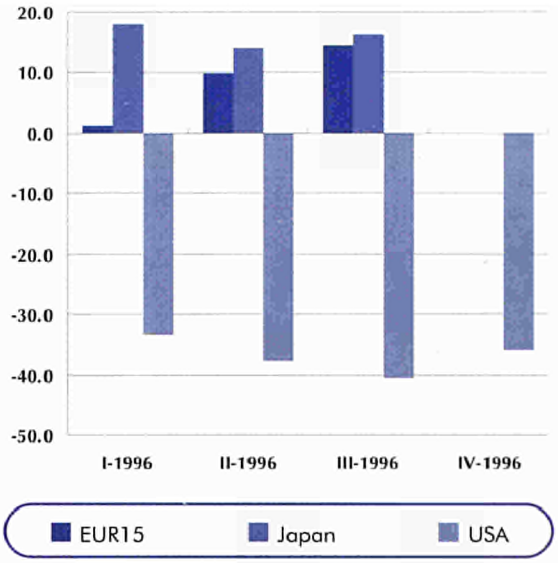
Figure 1.2

Year on year growth rates (t/t-4) for consumer prices (%)

Source: eurostat

Figure 1.3

Quarterly trade balance (billion ECU)



Source: eurostat

In France, industrial activity - especially in the aeronautics and capital goods sectors, which are more sensitive to variations in the value of the dollar - is likely to receive a boost in 1997 from exports to the CEECs, South-East Asia and the United States. France's unemployment rate stood at 12.7% of the active population in January 1997, a rise of 0.4 points over a year and of 0.1 points compared with the previous month.

Table 1.1

Year on year growth rates (t/t-12) for industrial production (%)

	EUR15	Japan	USA
02-96	0.1	1.1	1.9
03-96	-0.1	-0.8	1.3
04-96	-0.5	-1.2	3.1
05-96	-1.0	2.5	2.9
06-96	0.7	1.3	3.3
07-96	1.1	4.3	3.2
08-96	-0.2	1.7	2.8
09-96	0.2	4.4	2.6
10-96	1.4	5.2	3.2
11-96	0.9	4.9	3.8
12-96	-0.5	3.1	4.0
01-97	1.0	7.9	4.8

Source: eurostat

In Belgium, producer prices rose by 0.9% between January 1996 and January 1997. Unemployment stood at 9.4% of the active population in January 1997 compared with 10.1% a year previously. Car sales fell by 12% between February 1996 and February 1997.

In the United Kingdom, GDP rose by 0.8% in the fourth quarter of 1996 compared with the previous quarter and by 2.5% compared with the same quarter of the previous year. Production in volume terms increased by 0.9% between the third and the fourth quarters of 1996 in both industry and services. The 3.7% annual rise in consumption recorded in December 1996 was doubtless one of the factors at play in stimulating GDP. However, the rise in the value of sterling, together with that of the dollar, is likely to lead to a fall in exports. The consumer price index showed inflation of 2.2% between January 1996 and January 1997.

In Ireland, industrial production rose by 7.1% between November 1996 and January 1997 compared with the same three previous months.

In Spain, GDP showed faster growth in the fourth quarter of 1996 than in the previous quarter (2.6% as against 2.2%). Employment rose by 1.5% in the fourth quarter of 1996 compared with the previous quarter and by 3.1% compared with the same quarter of 1995. As a result, the unemployment rate fell from 21.9% in the third quarter of 1996 to 21.7% in the fourth quarter of the same year.

In Greece, the unemployment rate in January 1997 stood at 7.8% compared with 7.5% in December 1996. The construction cost index showed an annual rate of increase of 6.9% in January 1997.

In the Nordic countries, Finland saw its production grow by 6.2% between December 1995 and December 1996, reflecting both expanding demand from the CEECs and the combined effects of increased purchasing power and markedly lower interest rates. Finland also recorded in 1996 a marked increase in the number of building permits issued and a rise of 20% in sales of cars. In January 1997, unemployment in Finland stood at 16.7% (compared with 17.4% a year before) and in Denmark at 8.3% (compared with 9.2% a year before). In Sweden, car sales also rose (by 26.0% between February 1996 and February 1997), but its index of industrial producer prices showed an annual decline of 0.3% in January 1997.

Table 1.2

Year on year growth rates (t/t-12) for consumer prices (%)

	EUR15	Japan	USA
02-96	2.7	-0.2	2.7
03-96	2.7	0.1	2.8
04-96	2.7	0.4	2.9
05-96	2.7	0.3	2.9
06-96	2.5	0.0	2.8
07-96	2.5	0.6	3.0
08-96	2.3	0.2	2.9
09-96	2.3	-0.1	3.0
10-96	2.4	0.1	3.0
11-96	2.2	0.5	3.3
12-96	2.2	0.2	3.3
01-97	2.2	0.0	3.0

Source: eurostat

The United States and Japan

GDP in the United States increased at an annual rate of 4.7% over the last three months of 1996 as a result of growth in exports (major aircraft sales in particular). Industrial production rose by 4.2% over the period November 1996 to January 1997 compared with the same three months of the previous year. Consumer confidence is also strong, thanks to the situation on the labour market, higher wages and the rises recorded on the stock exchange.

In Japan, industrial production increased between November 1996 and January 1997 by 5.2% compared with the same three previous months. This was due to the healthy exports markets in the automobile, IT and telephone sectors. The recovery in private consumption at this stage in the year is due to early consumer spending to beat the April VAT increase from 3% to 5%.

Table 1.3

Monthly trade balance (billion ECU)

	EUR15	Japan	USA
02-96	1.2	6.3	-10.0
03-96	4.0	9.8	-11.4
04-96	1.9	4.0	-12.4
05-96	3.6	3.2	-13.6
06-96	4.3	6.8	-11.8
07-96	8.0	5.3	-13.9
08-96	4.9	4.1	-12.9
09-96	1.6	7.0	-13.9
10-96	:	4.7	-11.3
11-96	:	:	-11.3
12-96	:	:	-13.5
01-97	:	:	-15.6

Source: eurostat

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The Panorama CD-ROM Professional Version

The Panorama of EU Industry has established itself as one of the major sources of data and commentary on EU industrial activity - giving a wide cross-sectional analysis of some 200 industrial and service activities. Now Eurostat has launched a database - containing not only the text and tables from the publication, but also:

★ country breakdowns of EU totals;

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★ and data from National Accounts.

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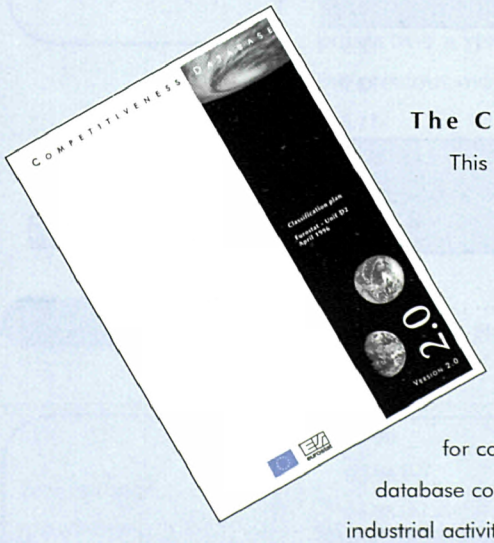

The Competitiveness Database

This is a new product, bringing together a wide range of indicators linked to industrial competitiveness for the EU Member States and OECD countries. This database will be vital for anyone interested in studying industrial competitiveness, for comparing industrial opportunities. The database covers some 30 countries in depth, 200 industrial activities and nearly 100 indicators, for the period 1980-1995. The database comes on CD-ROM and includes Eurostat standard CUB.X software for viewing and extracting the data.

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Business cycle at a glance

Short-term indicators

production index, producer price index, employment index, capacity utilisation, the construction sector, foreign trade indices

data extracted on: 9/4/97

For full methodological notes and an explanation of the signs and abbreviations used in this publication, please refer to page 71

Table 2.1

Business cycle at a glance - situation for the production index of the main industrial groupings, trend cycle

	Latest 3 months available	Total industry	Intermediate goods	Capital goods	Consumer durables	Consumer non-durables
EUR15	11-96 ⇨ 01-97	→	↗	→	↘	→
B	11-96 ⇨ 01-97	↘	↗	↘	↘	→
DK	10-96 ⇨ 12-96	→	→	↘	↘	→
D	11-96 ⇨ 01-97	↗	→	↗	↘	→
EL	10-96 ⇨ 12-96	→	→	↗	↗↗	↘
E	11-96 ⇨ 01-97	→	→	↗	→	→
F	11-96 ⇨ 01-97	→	→	→	→	→
IRL	10-96 ⇨ 12-96	↗↗	↗	↗↗	:	↗
I	11-96 ⇨ 01-97	↘	↘	↘	↘↘	→
L	10-96 ⇨ 12-96	↗	↗	↗	↗↗	↗
NL	11-96 ⇨ 01-97	↗	↗	↘	↗	→
A	⇨	:	:	:	:	:
P	10-96 ⇨ 12-96	↘	↘↘	↗↗	↗↗	↗
FIN	11-96 ⇨ 01-97	↗	↗↗	↗	↗↗	→
S	11-96 ⇨ 01-97	↗	↗	↗↗	↗	↗
UK	11-96 ⇨ 01-97	↗	↗	↗	↗	→
Japan	11-96 ⇨ 01-97	↗	↗	↗↗	↗	↗
USA	11-96 ⇨ 01-97	↗	↗	↗	↗	↗

Growth rates:

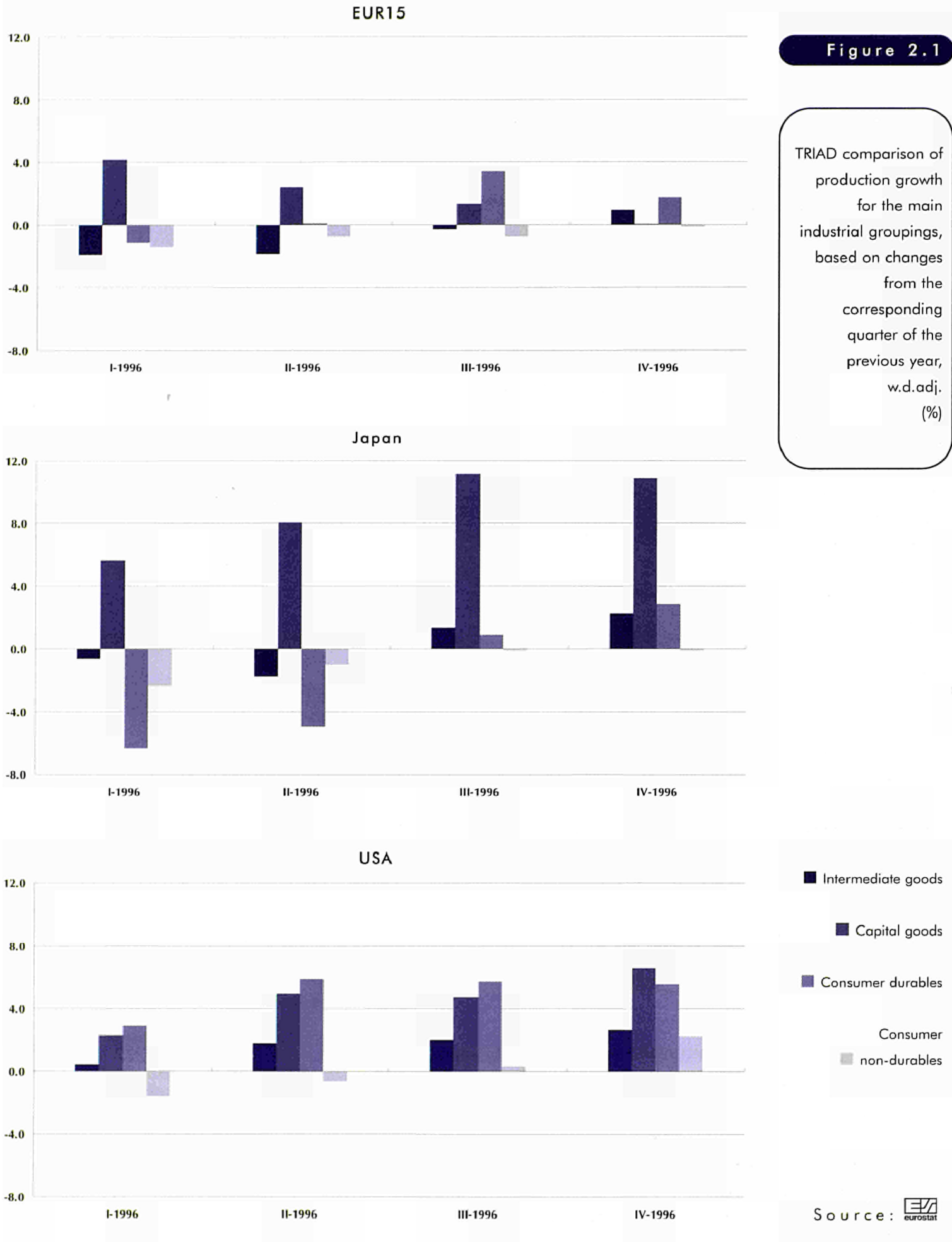
↗↗			>2.5%
↗	0.5%	→	2.5%
→	-0.5%	→	0.5%
↘	-2.5%	→	-0.5%
↘↘			<-2.5%

Source: eurostat

PRODUCTION INDEX - W.D.ADJ.

Figure 2.1

TRIAD comparison of production growth for the main industrial groupings, based on changes from the corresponding quarter of the previous year, w.d.adj. (%)



Source: eurostat

Table 2.2

Indices of production for total industry, w.d.adj. (1990 = 100)

	1994	1995	1996	08-96	09-96	10-96	11-96	12-96	01-97
EUR15	99.4	103.2	103.4	81.2	107.1	109.2	111.2	103.2	101.0
B	94.7	98.7	99.3	81.1	110.8	100.7	109.6	96.5	92.7
DK	111.2	115.8	117.1	95.0	120.3	126.7	125.2	125.3	:
D	93.9	95.9	96.0	87.0	101.2	103.6	102.7	97.4	91.8
EL	95.7	97.4	98.3	104.8	91.2	110.0	105.1	101.8	:
E	98.7	103.3	102.2	65.0	106.9	110.3	110.7	95.8	102.0
F	97.6	99.3	99.4	75.2	100.5	104.9	105.3	98.9	101.7
IRL	133.3	158.5	171.1	161.8	146.4	165.9	179.7	194.6	:
I	101.7	107.9	104.9	51.9	111.3	109.6	113.2	97.3	99.2
L	100.5	101.0	100.6	98.3	75.9	102.1	102.8	105.9	:
NL	103.2	106.7	110.2	92.2	106.1	112.2	117.9	121.2	115.0
A	:	:	:	:	:	:	:	:	:
P	94.9	99.4	100.1	105.5	73.8	105.4	103.9	103.1	:
FIN	107.3	115.3	118.0	111.5	126.0	126.7	129.1	122.8	120.4
S	103.8	114.1	117.4	105.7	122.8	122.3	128.0	137.0	115.8
UK	103.5	106.0	107.1	94.5	107.1	111.2	115.5	108.2	105.3
Japan	93.1	96.3	98.6	90.1	104.0	100.8	103.7	101.7	93.8
USA	109.8	113.4	116.5	120.3	120.5	118.9	117.3	116.5	118.0

Source: eurostat

Table 2.3

TRIAD comparison of indices of production for the main industrial groupings, w.d.adj. (1990 = 100)

	1994	1995	1996	08-96	09-96	10-96	11-96	12-96	01-97
Total industry									
EUR15	99.4	103.2	103.4	81.2	107.1	109.2	111.2	103.2	101.0
Japan	93.1	96.3	98.6	90.1	104.0	100.8	103.7	101.7	93.8
USA	109.8	113.4	116.5	120.3	120.5	118.9	117.3	116.5	118.0
Intermediate goods									
EUR15	102.0	105.0	104.1	82.7	107.2	109.9	111.0	100.2	105.2
Japan	95.5	99.3	99.7	92.1	102.6	103.4	104.6	101.5	96.4
USA	104.1	105.4	107.3	113.4	113.6	110.6	107.9	105.8	104.9
Capital goods									
EUR15	91.8	98.8	100.7	77.1	105.8	104.4	108.6	111.7	90.8
Japan	85.6	89.5	97.4	88.1	111.1	99.6	103.1	102.0	92.4
USA	103.7	108.6	113.7	116.8	118.8	117.3	115.7	114.0	114.8
Consumer durables									
EUR15	95.9	97.7	98.6	64.6	108.6	109.2	109.0	92.0	93.2
Japan	82.3	81.3	79.7	61.7	84.2	85.3	87.2	78.9	75.3
USA	114.5	120.9	127.0	130.5	132.0	131.0	129.0	126.5	127.1
Consumer non-durables									
EUR15	102.1	104.2	103.4	87.6	107.6	111.1	112.6	100.8	98.1
Japan	98.8	98.7	97.8	90.1	98.0	98.1	104.2	105.2	82.7
USA	107.2	108.5	108.6	113.7	114.4	112.3	109.2	107.1	107.0

Source: eurostat

PRODUCTION INDEX - SEASONALLY ADJUSTED

Table 2.4

	1994	1995	1996	08-96	09-96	10-96	11-96	12-96	01-97
EUR15	99.4	103.2	103.4	103.3	103.5	103.9	104.1	103.7	104.0
B	94.7	98.7	99.3	89.7	103.4	99.1	99.7	101.2	96.2
DK	111.2	115.8	117.1	121.4	118.2	116.6	118.1	118.3	:
D	93.9	95.9	96.0	96.8	96.1	96.9	96.7	97.4	97.9
EL	95.7	97.4	98.3	99.7	99.0	97.7	98.4	100.0	:
E	98.7	103.3	102.2	103.6	102.5	104.4	103.4	102.6	103.6
F	97.6	99.3	99.4	101.1	99.7	99.6	99.6	100.4	99.2
IRL	133.3	158.5	171.1	174.4	170.5	166.8	174.1	183.1	:
I	101.7	107.9	104.9	108.2	105.3	104.7	103.1	102.0	102.6
L	100.5	101.0	100.6	101.0	96.4	101.2	100.8	102.3	:
NL	103.2	106.7	110.2	110.0	109.8	109.2	110.1	111.2	110.4
A	:	:	:	:	:	:	:	:	:
P	94.9	99.4	100.1	100.8	103.9	102.5	100.4	100.4	:
FIN	107.3	115.3	118.0	117.7	120.0	120.3	121.2	121.9	122.5
S	103.8	114.1	117.4	116.8	118.1	117.4	121.8	125.7	123.0
UK	103.5	106.0	107.1	107.1	107.5	107.4	108.0	108.6	108.6
Japan	93.1	96.3	98.6	97.4	98.7	102.5	101.2	101.2	106.2
USA	109.8	113.4	116.5	117.1	117.3	117.5	118.5	119.1	119.1

Indices of production for total industry, seasonally adjusted (1990 = 100)

Source: eurostat

Table 2.5

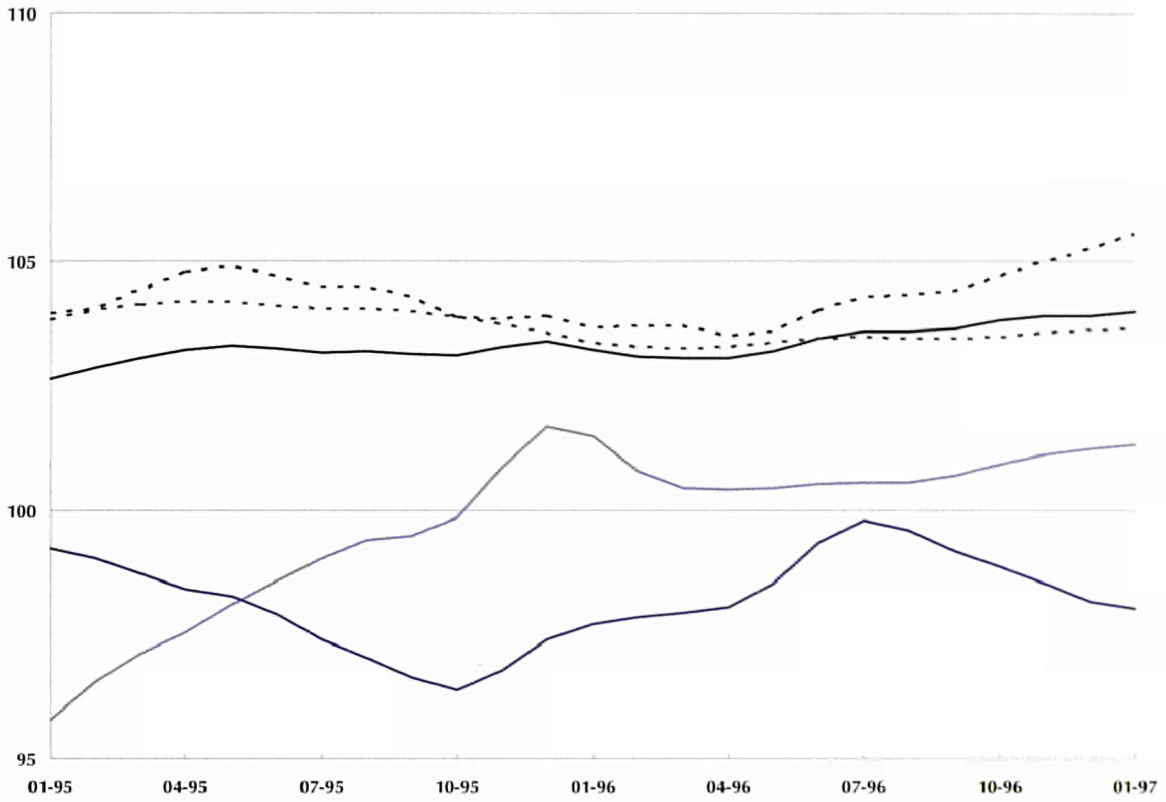
	1994	1995	1996	08-96	09-96	10-96	11-96	12-96	01-97
Total industry									
EUR15	99.4	103.2	103.4	103.3	103.5	103.9	104.1	103.7	104.0
Japan	93.1	96.3	98.6	97.4	98.7	102.5	101.2	101.2	106.2
USA	109.8	113.4	116.5	117.1	117.3	117.5	118.5	119.1	119.1
Intermediate goods									
EUR15	102.0	105.0	104.1	104.1	104.3	104.8	105.1	105.1	105.7
Japan	95.5	99.3	99.7	98.5	99.6	102.5	101.4	101.8	106.1
USA	104.1	105.4	107.3	107.9	108.5	108.1	109.4	108.6	108.1
Capital goods									
EUR15	91.8	98.8	100.7	99.7	101.1	100.6	101.4	101.3	101.3
Japan	85.6	89.5	97.4	97.1	99.1	102.8	102.4	101.4	106.9
USA	103.7	108.6	113.7	114.8	115.0	115.3	115.9	116.4	117.3
Consumer durables									
EUR15	95.9	97.7	98.6	99.6	98.8	98.9	99.1	97.2	98.3
Japan	82.3	81.3	79.7	75.9	79.5	86.7	81.6	80.5	90.5
USA	114.5	120.9	127.0	128.7	128.4	128.3	129.7	130.5	130.4
Consumer non-durables									
EUR15	102.1	104.2	103.4	103.4	103.3	103.4	103.6	103.7	103.7
Japan	98.8	98.7	97.8	97.8	96.2	99.3	99.3	99.3	102.2
USA	107.2	108.5	108.6	108.5	109.2	109.7	110.3	111.2	110.8

TRIAD comparison of indices of production for the main industrial groupings, seasonally adjusted (1990 = 100)

Source: eurostat

Figure 2.2

EUR15 production index by main industrial grouping, trend cycle (1990 = 100)



Source: eurostat

Table 2.6

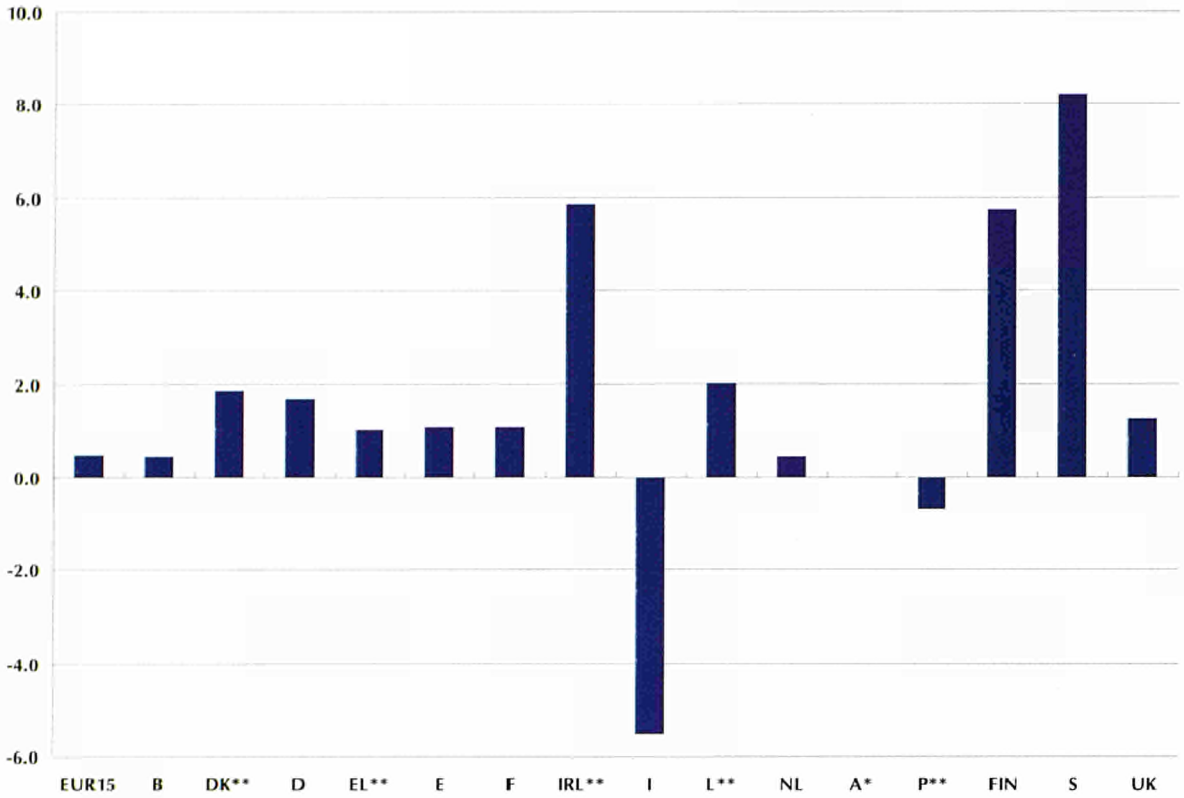
Three month on three month growth rates for the production index of the main industrial groupings, trend cycle (%)

	Latest 3 months available			Total industry	Intermediate goods	Capital goods	Consumer durables	Consumer non-durables
EUR15	11-96	⇨	01-97	0.2	0.8	0.5	-1.0	0.1
B	11-96	⇨	01-97	-0.7	0.7	-1.6	-1.1	-0.4
DK	10-96	⇨	12-96	0.0	0.0	-1.2	-1.4	0.0
D	11-96	⇨	01-97	0.7	0.5	2.0	-0.8	0.1
EL	10-96	⇨	12-96	0.0	0.3	1.4	2.6	-0.8
E	11-96	⇨	01-97	0.2	-0.1	0.9	0.3	0.3
F	11-96	⇨	01-97	-0.2	0.2	-0.5	-0.2	-0.4
IRL	10-96	⇨	12-96	2.6	1.0	7.9	:	1.2
I	11-96	⇨	01-97	-1.5	-2.2	-1.6	-3.2	0.2
L	10-96	⇨	12-96	1.5	1.6	1.9	16.6	1.0
NL	11-96	⇨	01-97	0.5	1.1	-1.4	0.7	0.3
A	10-95	⇨	12-95	0.8	-2.1	-2.1	0.5	-0.4
P	10-96	⇨	12-96	-0.6	-2.6	3.8	3.4	1.4
FIN	11-96	⇨	01-97	1.7	3.8	1.8	3.5	0.1
S	11-96	⇨	01-97	2.2	1.4	4.6	1.7	1.7
UK	11-96	⇨	01-97	0.9	1.3	1.1	0.6	-0.4
Japan	11-96	⇨	01-97	2.1	2.1	2.9	2.4	0.7
USA	11-96	⇨	01-97	1.1	0.5	1.2	1.2	1.3

Source: eurostat

PRODUCTION INDEX - W.D.ADJ.

Figure 2.3



Annual growth rates for the production index of total industry, based on changes from the corresponding three months of the previous year, w.d.adj., Nov-96 to Jan-97 (%)

Source: eurostat

Table 2.7

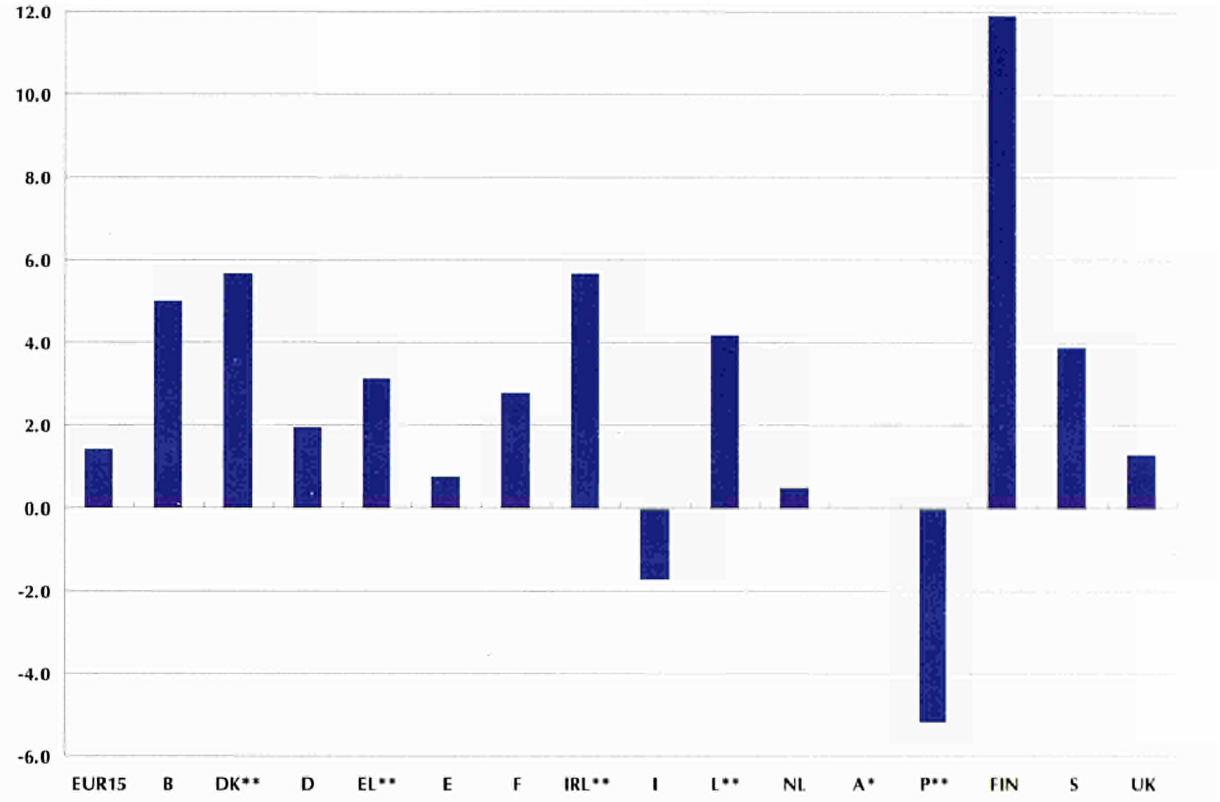
	Latest 3 months available			Total industry	Intermediate goods	Capital goods	Consumer durables	Consumer non-durables
EUR15	11-96	⇨	01-97	0.5	1.5	-0.9	0.7	0.2
B	11-96	⇨	01-97	0.4	5.0	-2.8	4.8	-4.0
DK	10-96	⇨	12-96	1.3	4.1	-0.8	1.5	0.0
D	11-96	⇨	01-97	1.7	2.0	2.4	1.1	0.2
EL	10-96	⇨	12-96	0.3	1.9	3.9	4.7	-4.3
E	11-96	⇨	01-97	1.1	0.8	4.4	7.3	-0.8
F	11-96	⇨	01-97	1.1	2.8	0.0	0.7	-1.1
IRL	10-96	⇨	12-96	5.2	5.9	5.4	:	4.0
I	11-96	⇨	01-97	-5.5	-1.7	-16.0	-6.4	-0.5
L	10-96	⇨	12-96	1.5	1.9	8.3	-2.1	-2.3
NL	11-96	⇨	01-97	0.5	0.5	-1.6	4.3	1.2
A	10-95	⇨	12-95	6.1	0.0	1.8	2.0	-1.4
P	10-96	⇨	12-96	-1.4	-6.2	15.7	0.0	7.7
FIN	11-96	⇨	01-97	5.7	11.9	2.7	9.7	0.9
S	11-96	⇨	01-97	8.2	3.9	10.7	7.1	13.4
UK	11-96	⇨	01-97	1.3	1.3	2.3	3.0	0.0
Japan	11-96	⇨	01-97	5.2	3.0	11.3	4.0	0.9
USA	11-96	⇨	01-97	4.2	2.8	7.1	6.0	3.1

Annual growth rates for the production index of the main industrial groupings, based on changes from the corresponding three months of the previous year, w.d.adj. (%)

Source: eurostat

Figure 2.4

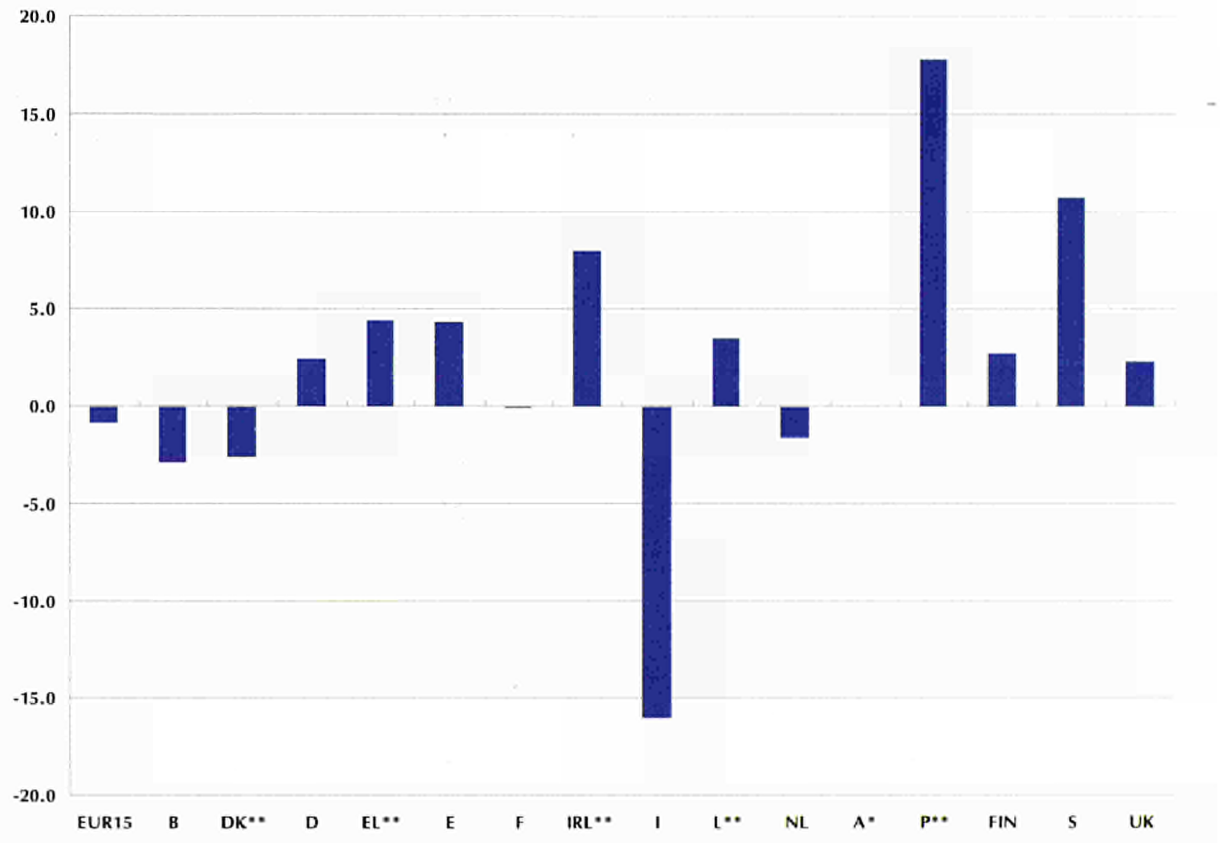
Annual growth rates for the production index of intermediate goods, based on changes from the corresponding three months of the previous year, w.d.adj., Nov-96 to Jan-97 (%)



Source: eurostat

Figure 2.5

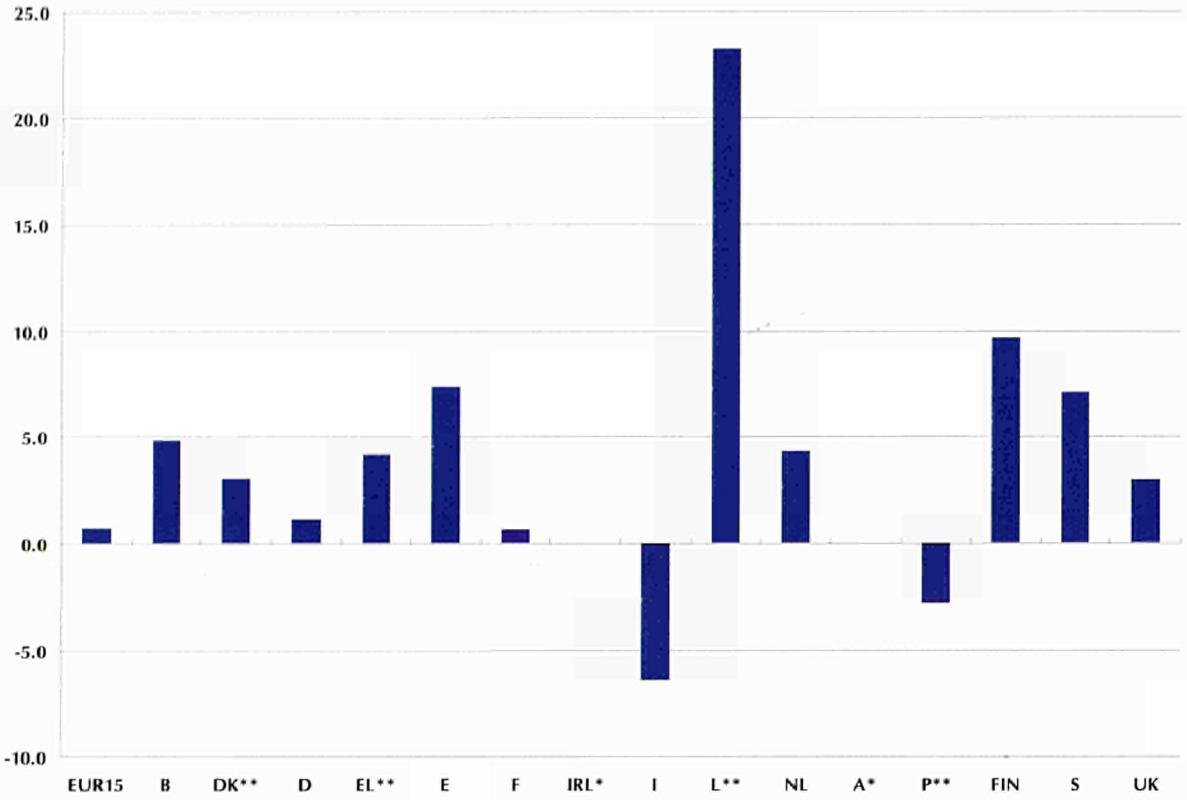
Annual growth rates for the production index of capital goods, based on changes from the corresponding three months of the previous year, w.d.adj., Nov-96 to Jan-97 (%)



Source: eurostat

PRODUCTION INDEX - W.D.ADJ.

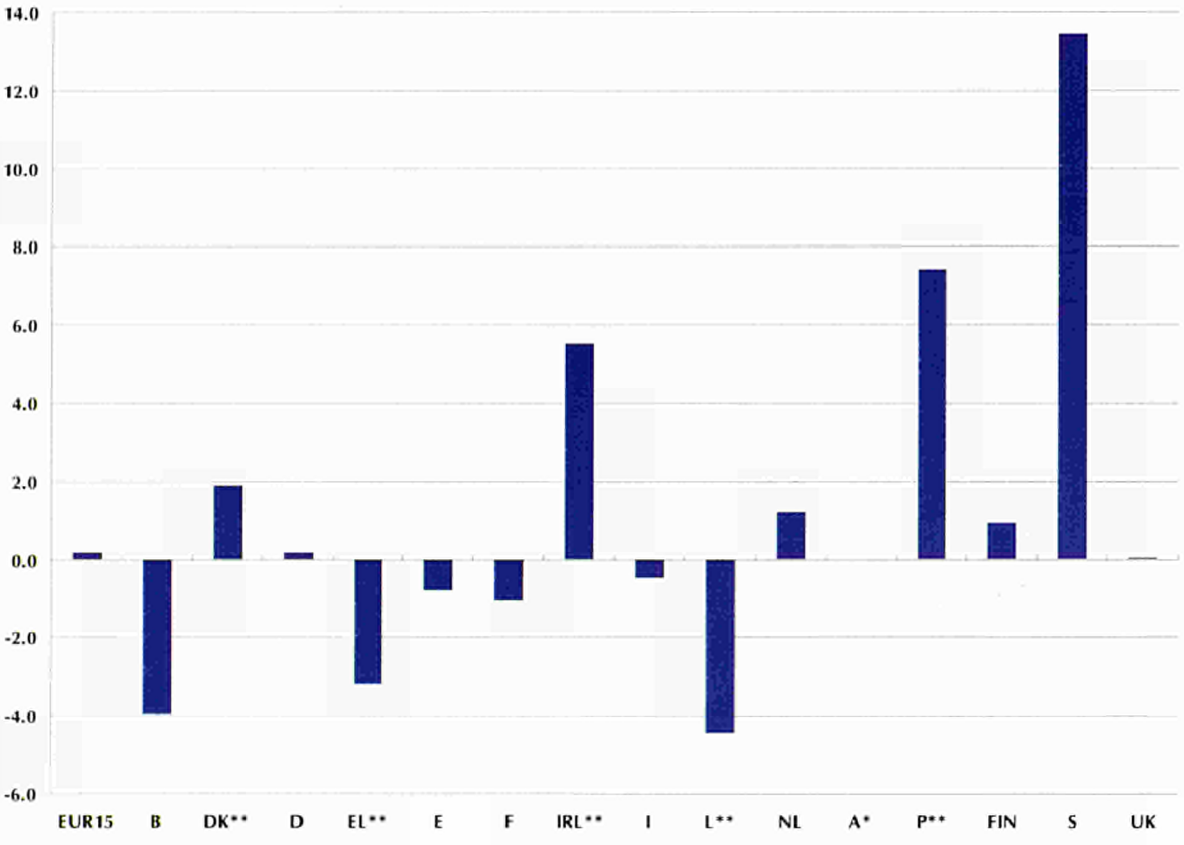
Figure 2.6



Annual growth rates for the production index of consumer durables, based on changes from the corresponding three months of the previous year, w.d.adj., Nov-96 to Jan-97 (%)

Source: eurostat

Figure 2.7

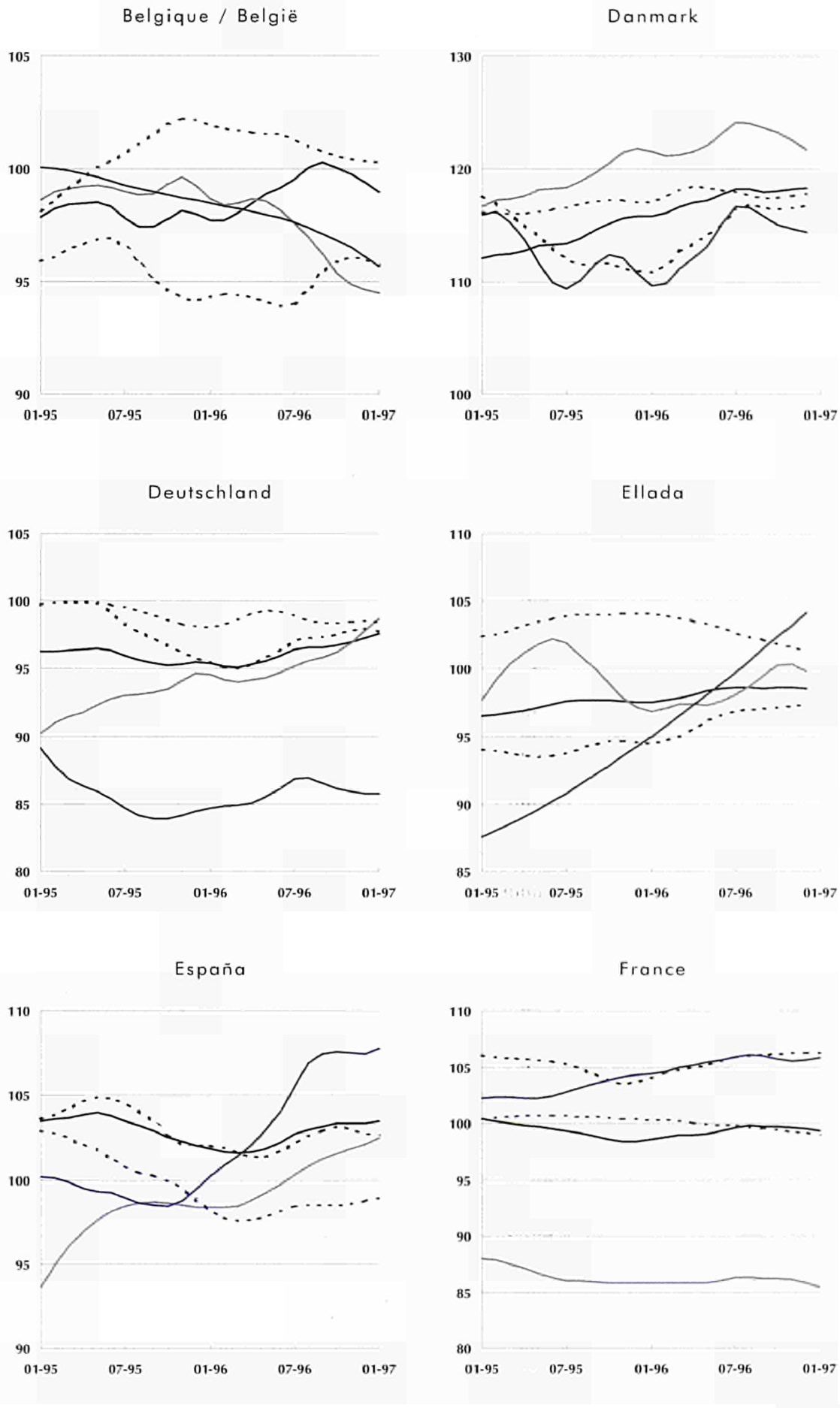


Annual growth rates for the production index of consumer non-durables, based on changes from the corresponding three months of the previous year, w.d.adj., Nov-96 to Jan-97 (%)

Source: eurostat

Figure 2.8

Production index by main industrial grouping, trend cycle (1990 = 100)

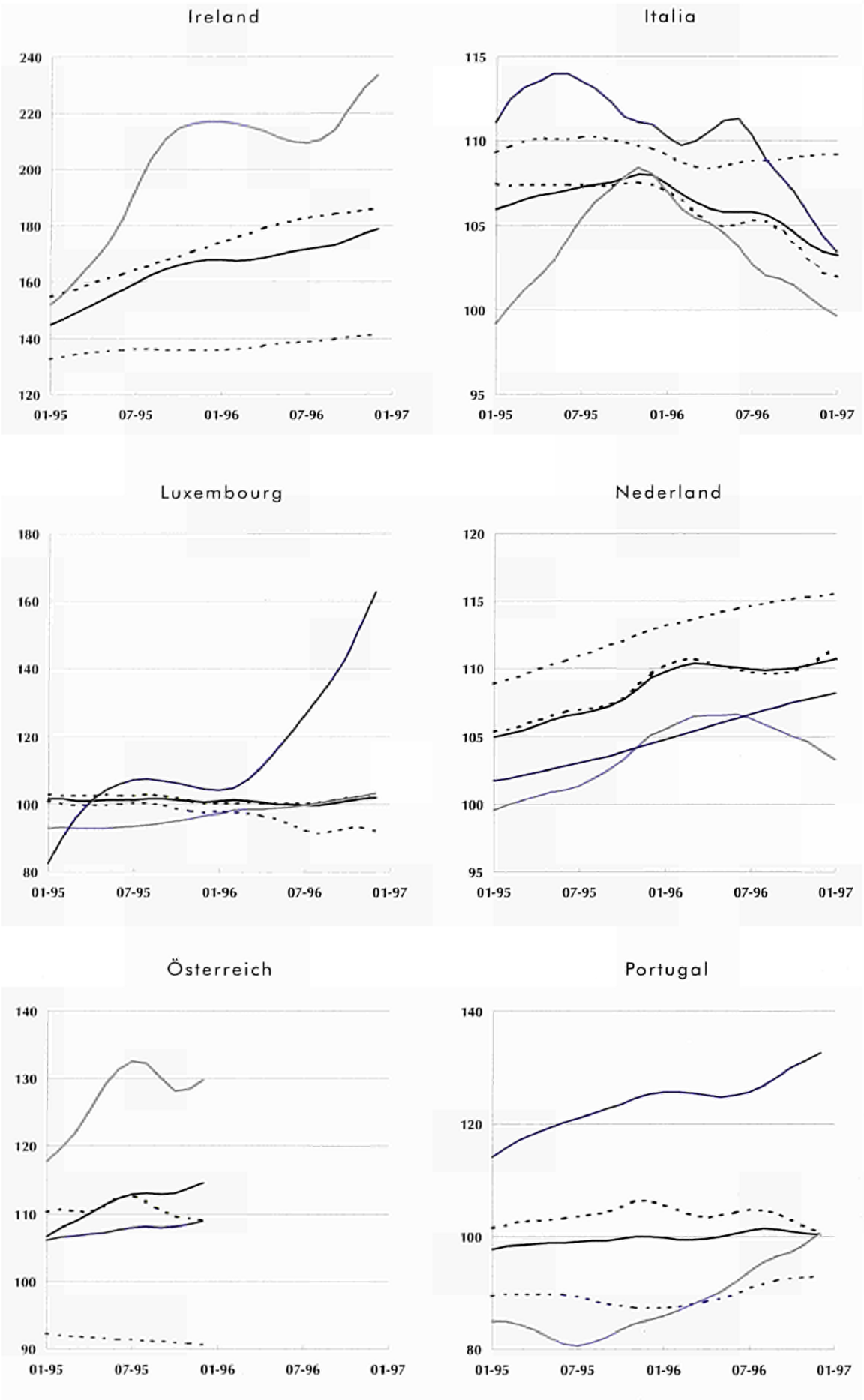


Source: eurostat

PRODUCTION INDEX - TREND CYCLE

Figure 2.8

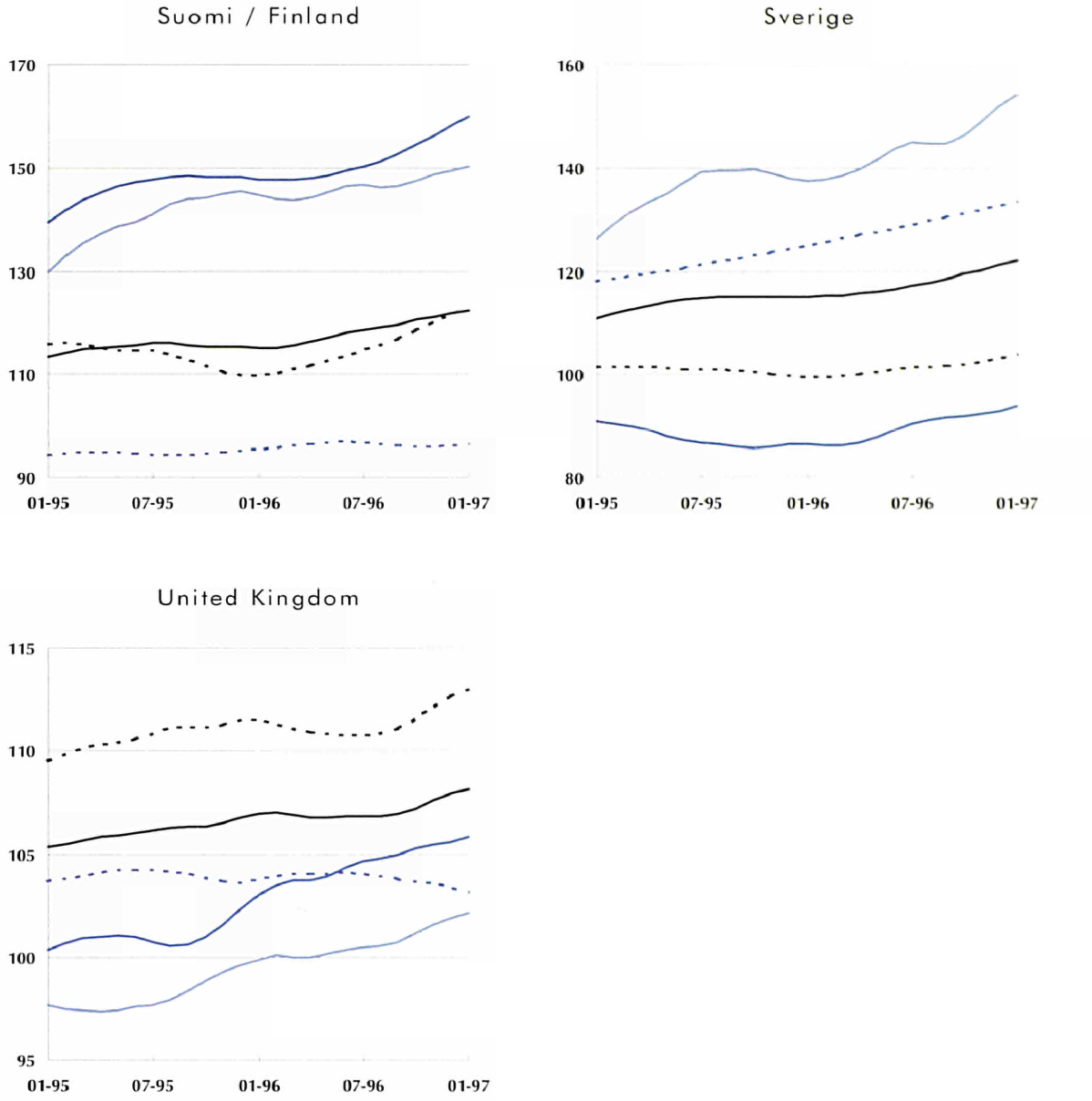
Production index by main industrial grouping, trend cycle (1990 = 100)



Source: eurostat

Figure 2.8

Production index by main industrial grouping, trend cycle (1990 = 100)



Total industry ——

Intermediate goods - - - - -

Capital goods ——

Consumer durables ——

Consumer non-durables - - - - -

Source: eurostat

Further information - the production index:

The index of production measures changes in volume (at constant prices) of gross value added created by a given activity, the activity indices being aggregated (like the aggregation at Community level) by means of a system of weighting according to gross value added at factor cost.

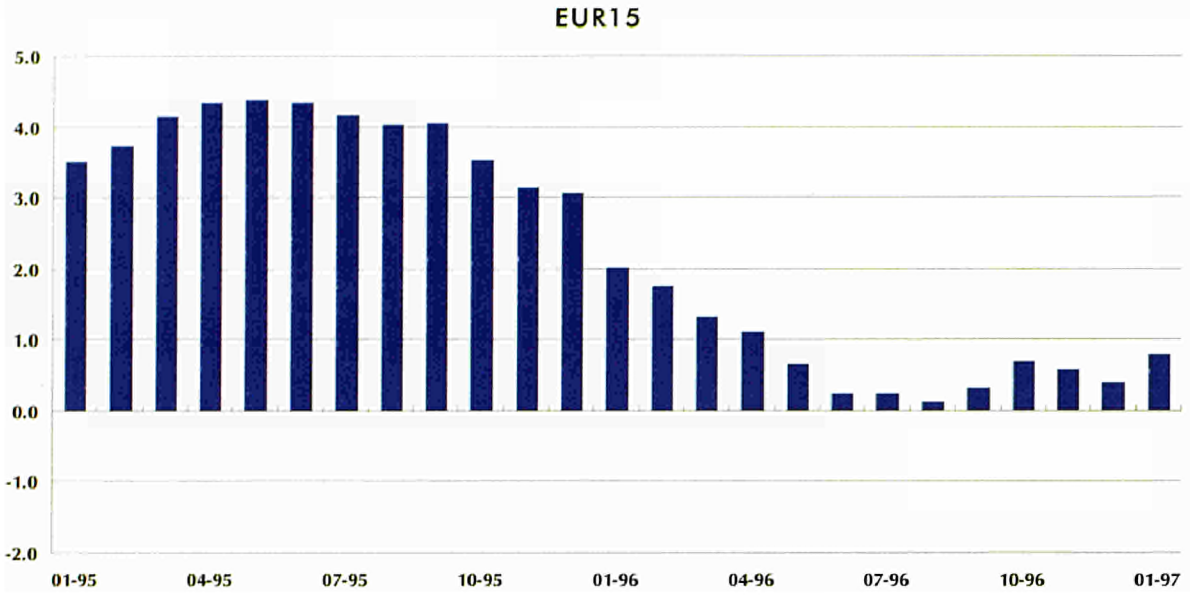
The indices of production are adjusted in two stages. Firstly, account is taken of the variation in the number of working days in the month. The national Statistical Offices provide Eurostat with these series (except Denmark, France, Spain and the United Kingdom). Secondly, for EUR15 and most of the Member States a correction is made using seasonal adjustment with TRAMO / SEATS, a method developed by Professor Maravall and V.Gomez. For France, Finland, Sweden and the United Kingdom, the indices are adjusted by the national statistical offices themselves. All data from Ireland is converted to NACE Rev.1 from the old classification NACE 1970 and is therefore less reliable.

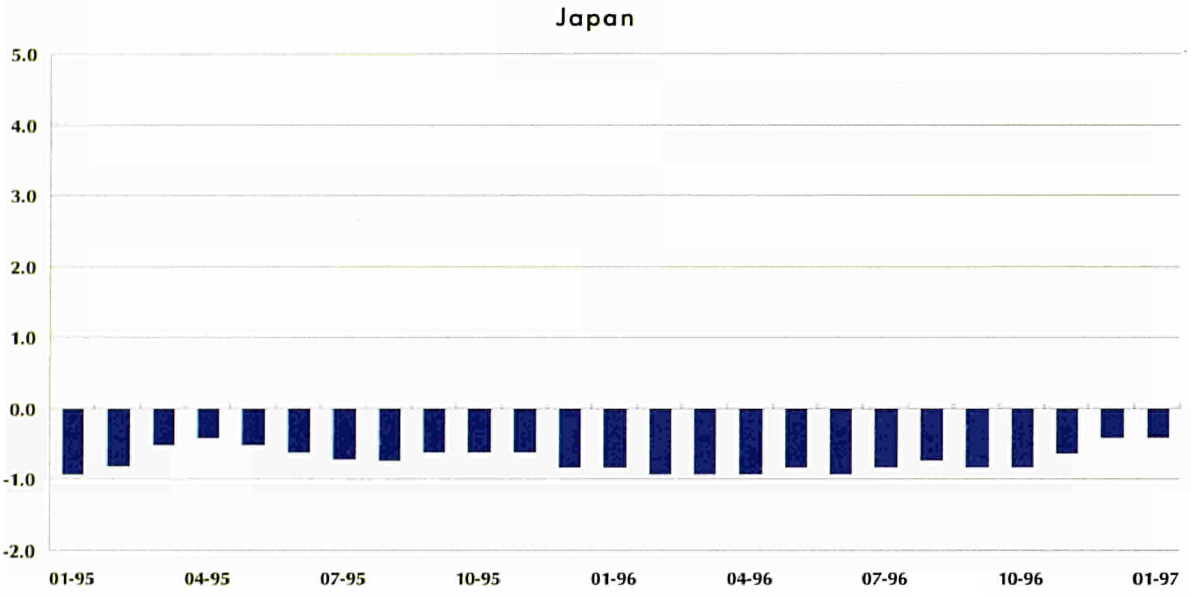
Full methodological notes may be found on page 71.

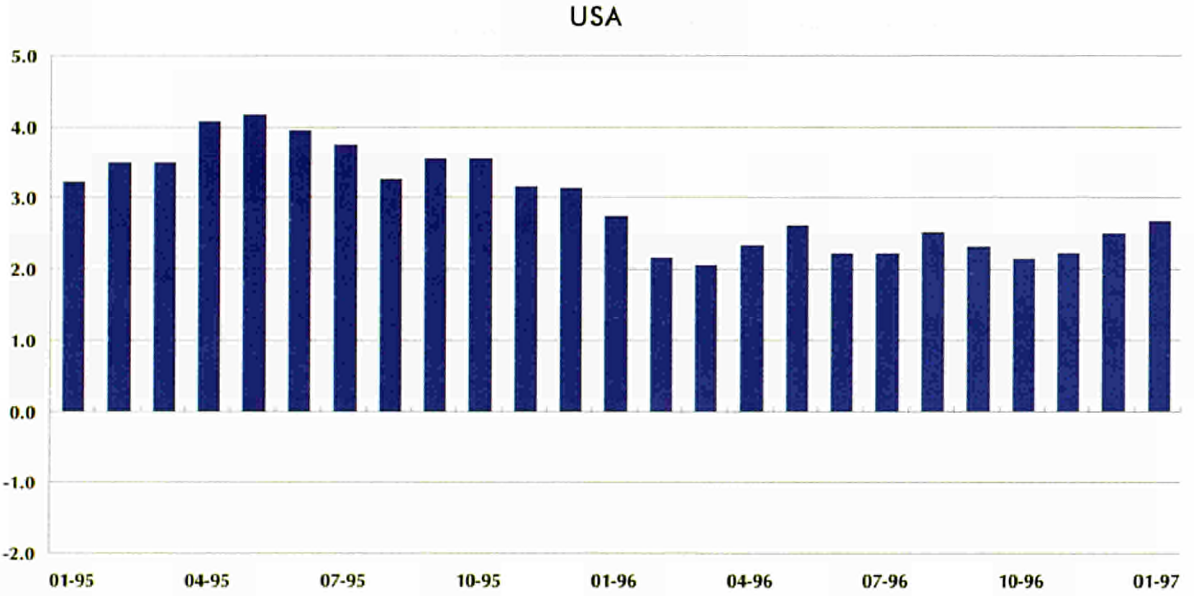
DOMESTIC PRODUCER PRICE INDEX - NATIONAL CURRENCY

Figure 2.9

TRIAD comparison of annual growth rates of producer prices for total industry, in national currency (%)





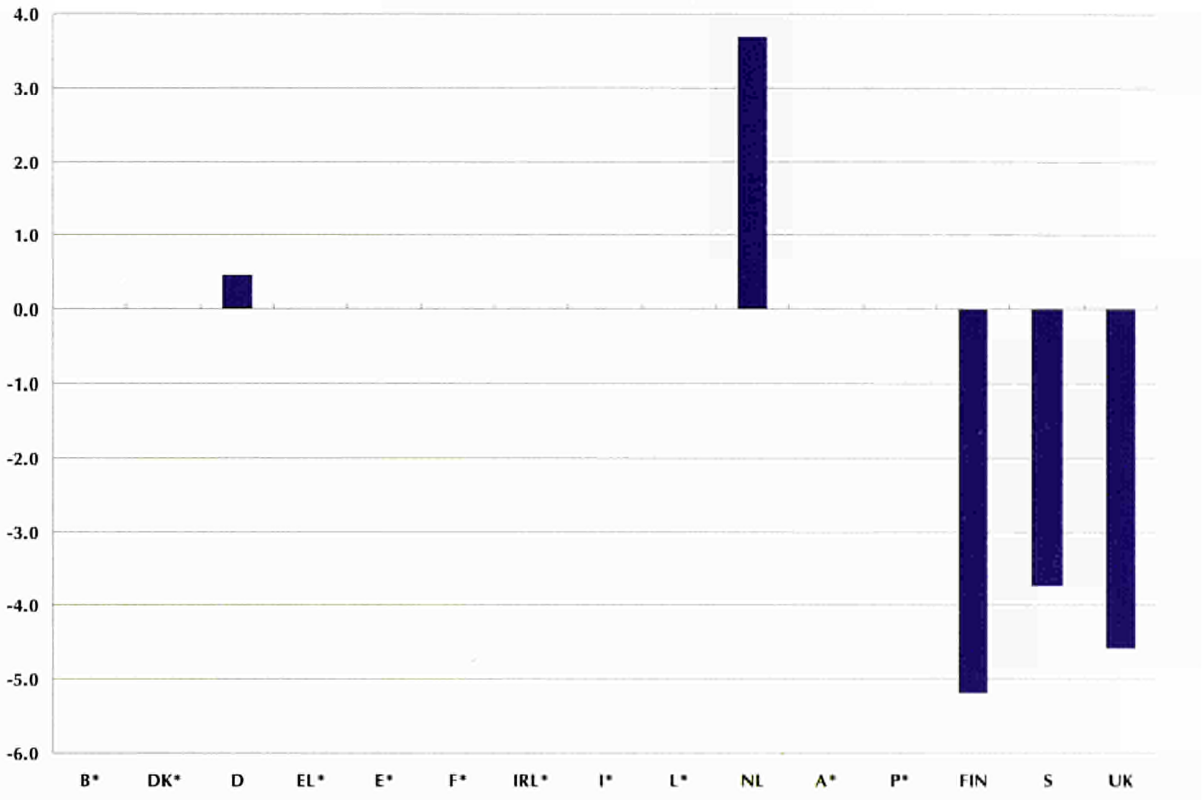


Source: eurostat

EXPORT PRICE INDEX AND DOMESTIC PRODUCER PRICE INDEX

Figure 2.10

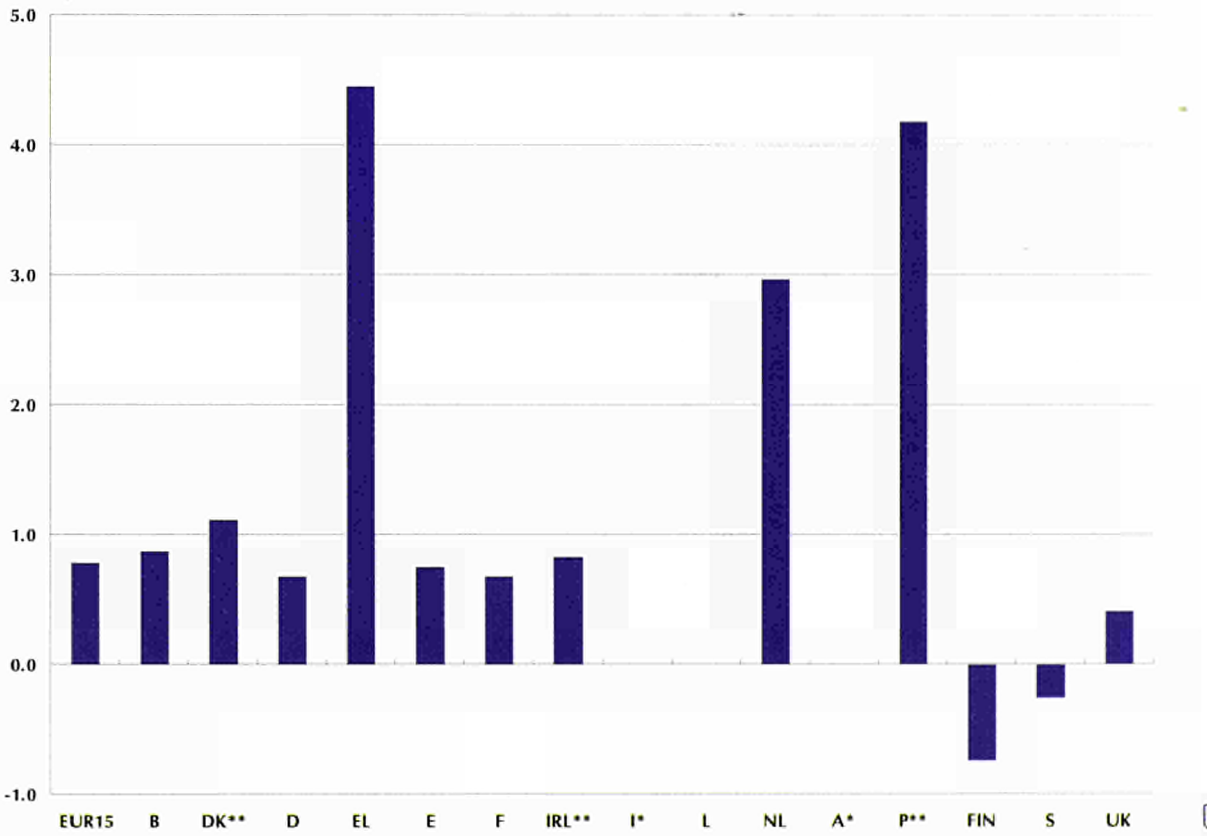
Annual growth rates of export prices for manufacturing industry, in national currency, Jan-97 (1990 = 100)



Source: eurostat

Figure 2.11

Annual growth rates of the producer price index of total industry, in national currency, Jan-97 (%)



Source: eurostat

eurostat

DOMESTIC PRODUCER PRICE INDEX

Table 2.8

	1994	1995	1996	08-96	09-96	10-96	11-96	12-96	01-97
EUR15	108.2	112.4	113.3	112.9	113.3	113.6	113.7	113.9	114.2
B	99.5	101.7	102.4	101.9	102.8	103.2	102.6	102.8	102.8
DK	99.7	103.4	105.1	105.1	105.0	105.5	105.6	105.4	:
D	104.7	106.5	106.0	105.9	106.1	106.3	106.3	106.3	106.6
EL	156.6	171.4	184.1	183.4	186.4	188.0	187.7	188.0	188.9
E	109.8	116.8	118.7	118.4	118.7	119.1	119.3	119.4	119.3
F	100.9	103.1	103.6	103.4	103.8	103.9	103.7	103.7	104.0
IRL	107.6	111.6	113.6	114.1	113.5	113.3	113.1	113.5	:
I	113.3	122.2	124.3	123.7	123.8	124.1	124.4	124.6	:
L	107.2	110.8	110.4	111.0	110.6	110.7	110.2	110.2	110.7
NL	101.0	104.0	105.8	106.1	106.6	106.8	106.4	106.6	107.7
A	:	:	:	:	:	:	:	:	:
P	112.3	116.6	120.2	120.3	120.6	120.8	121.7	121.3	:
FIN	105.8	107.7	107.6	106.8	107.2	107.6	107.4	107.8	107.7
S	108.6	117.3	118.0	118.0	118.1	118.3	117.8	117.6	117.7
UK	114.2	118.5	119.4	118.1	118.7	119.2	120.0	121.4	121.6
Japan	96.8	96.1	95.4	95.2	95.1	95.1	95.2	95.3	95.3
USA	103.6	107.3	109.8	110.3	110.2	110.0	110.2	110.8	111.5

Indices of producer prices for total industry, in national currency (1990 = 100)

Source: eurostat

Table 2.9

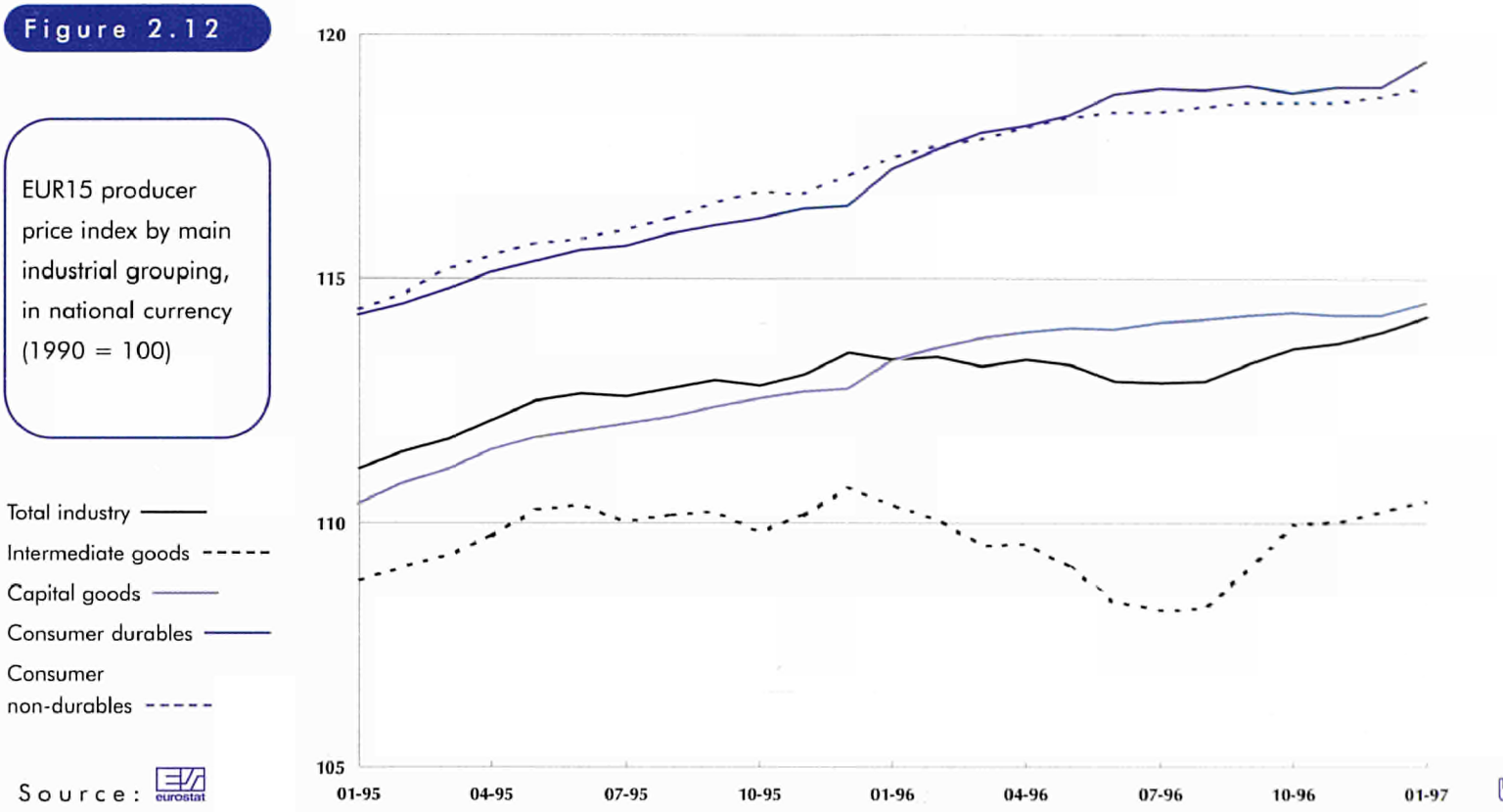
	1994	1995	1996	08-96	09-96	10-96	11-96	12-96	01-97
EUR15	102.4	104.2	106.5	106.0	106.7	107.4	107.6	108.2	108.8
B	106.4	112.0	110.5	110.3	110.9	110.5	109.4	109.1	108.6
DK	103.8	110.9	112.2	112.1	112.2	112.6	112.6	111.7	:
D	111.6	116.6	113.9	114.2	113.9	113.4	113.0	112.4	112.2
EL	109.6	114.0	121.5	121.6	123.6	125.6	124.3	123.5	124.6
E	89.4	92.8	95.6	95.0	95.3	95.2	95.0	94.6	94.3
F	106.0	109.2	110.3	110.1	110.3	110.5	109.8	109.4	109.3
IRL	104.2	105.0	110.0	110.6	109.4	110.4	111.0	113.6	:
I	90.1	87.3	96.6	96.8	97.9	98.7	98.1	99.2	99.9
L	114.7	121.9	119.2	120.1	119.2	118.6	117.5	116.9	116.8
NL	108.1	114.5	114.3	115.0	115.0	114.5	113.6	113.2	113.7
A	:	:	:	:	:	:	:	:	:
P	103.3	107.7	111.2	110.9	111.8	112.1	113.4	112.6	:
FIN	83.1	91.6	89.6	90.2	90.3	90.8	89.7	90.3	90.1
S	89.2	94.7	104.3	104.5	105.4	107.1	104.7	103.7	103.2
UK	105.1	102.0	104.9	101.8	104.1	107.2	111.5	115.3	118.5
Japan	146.5	144.2	126.9	126.2	125.2	123.4	121.9	122.9	122.1
USA	110.9	104.2	109.9	109.2	110.3	111.1	109.7	112.6	116.5

Indices of producer prices for total industry, in ECU terms (1990 = 100)

Source: eurostat

Figure 2.12

EUR15 producer price index by main industrial grouping, in national currency (1990 = 100)



Source: eurostat

Table 2.10

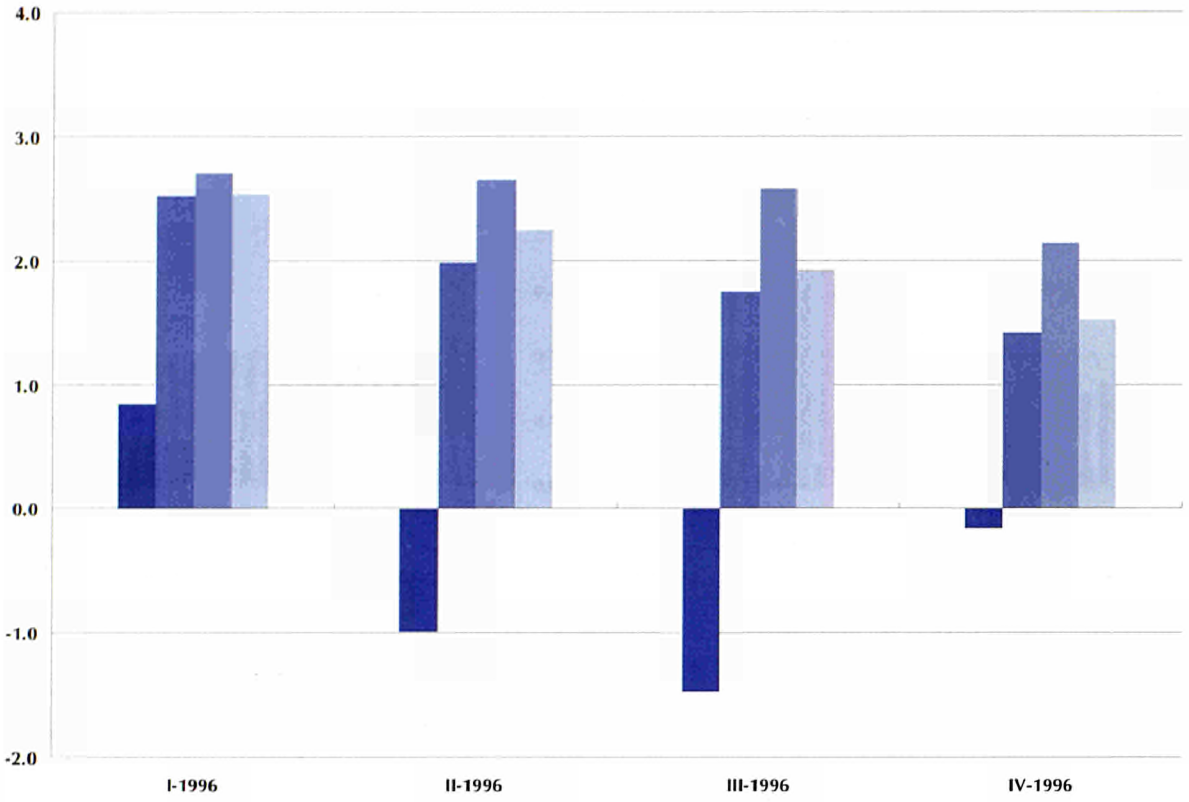
TRIAD comparison of indices of producer prices for the main industrial groupings, in national currency (1990 = 100)

	1994	1995	1996	08-96	09-96	10-96	11-96	12-96	01-97
Total industry									
EUR15	108.2	112.4	113.3	112.9	113.3	113.6	113.7	113.9	114.2
Japan	96.8	96.1	95.4	95.2	95.1	95.1	95.2	95.3	95.3
USA	103.6	107.3	109.8	110.3	110.2	110.0	110.2	110.8	111.5
Intermediate goods									
EUR15	104.9	109.9	109.4	108.2	109.1	110.0	110.0	110.2	110.4
Japan	:	:	:	:	:	:	:	:	:
USA	:	:	:	:	:	:	:	:	:
Capital goods									
EUR15	109.0	111.8	114.0	114.1	114.2	114.3	114.2	114.2	114.5
Japan	:	:	:	:	:	:	:	:	:
USA	:	:	:	:	:	:	:	:	:
Consumer durables									
EUR15	112.7	115.5	118.4	118.8	118.9	118.8	118.9	118.9	119.4
Japan	:	:	:	:	:	:	:	:	:
USA	:	:	:	:	:	:	:	:	:
Consumer non-durables									
EUR15	112.5	115.9	118.3	118.5	118.6	118.6	118.6	118.7	118.9
Japan	:	:	:	:	:	:	:	:	:
USA	:	:	:	:	:	:	:	:	:

Source: eurostat

DOMESTIC PRODUCER PRICE INDEX

Figure 2.13



EUR15 annual growth rates of producer prices for the main industrial groupings (%)

Source: eurostat

Table 2.11

	Latest month available	Total industry	Intermediate goods	Capital goods	Consumer durables	Consumer non-durables
EUR15	01-97	0.8	0.1	1.0	1.9	1.2
B	02-97	0.9	0.6	0.4	:	1.0
DK	12-96	1.0	1.7	2.9	2.5	-0.7
D	02-97	0.6	0.6	0.6	1.0	0.7
EL	01-97	4.4	4.5	6.9	4.4	4.0
E	01-97	0.8	-0.2	1.7	2.3	1.5
F	01-97	0.7	0.6	-0.8	-0.3	1.0
IRL	12-96	0.8	:	:	:	-0.3
I		:	:	:	:	:
L	01-97	0.0	-5.9	-0.4	0.1	2.3
NL	02-97	2.7	2.8	0.9	0.5	1.0
A		:	:	:	:	:
P	12-96	3.2	3.4	:	:	2.9
FIN	02-97	-0.6	-1.3	-0.4	-1.5	1.3
S	02-97	-0.1	-2.5	0.9	2.0	1.4
UK	02-97	0.3	-0.8	1.4	1.1	1.3
Japan	01-97	-0.4	:	:	:	:
USA	01-97	2.7	:	:	:	:

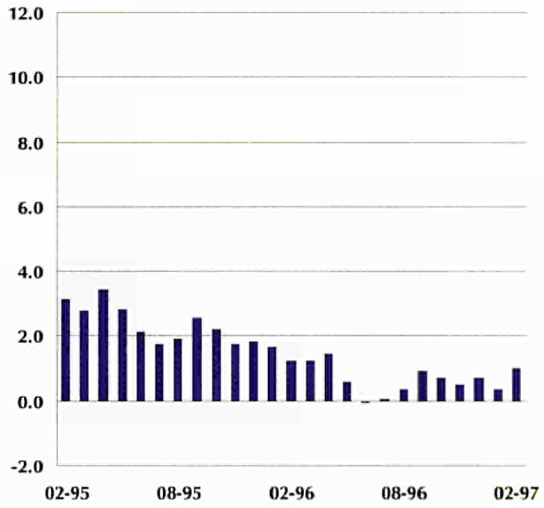
Annual growth rates of the producer price index of the main industrial groupings, in national currency (%)

Source: eurostat

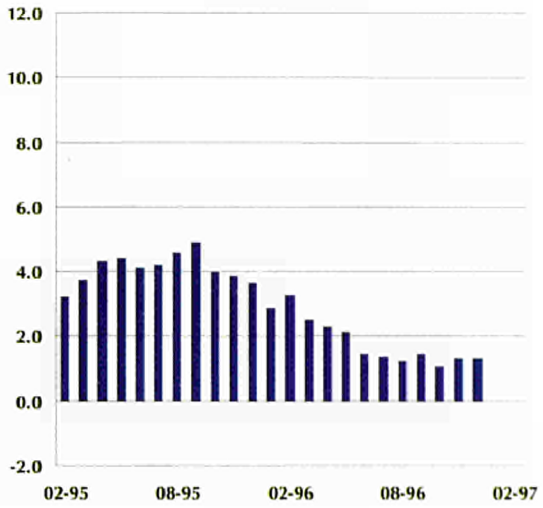
Figure 2.14

Annual growth rates of producer prices for total industry, in national currency (%)

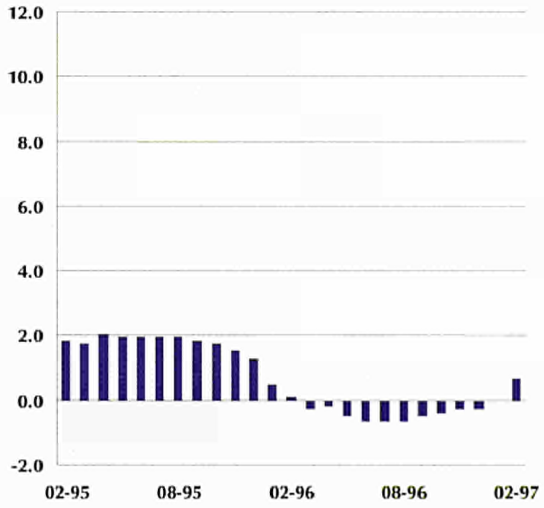
Belgique / België



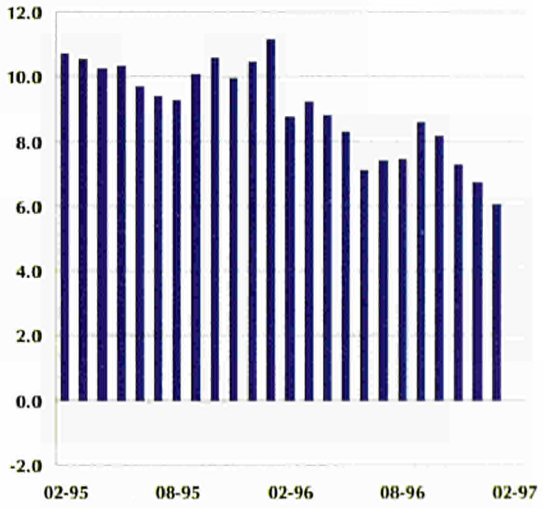
Danmark



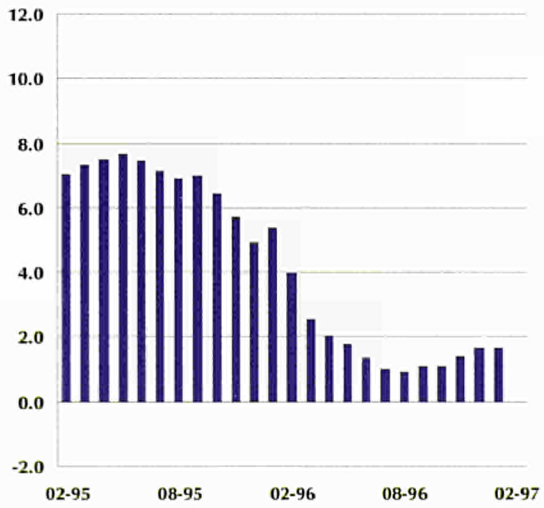
Deutschland



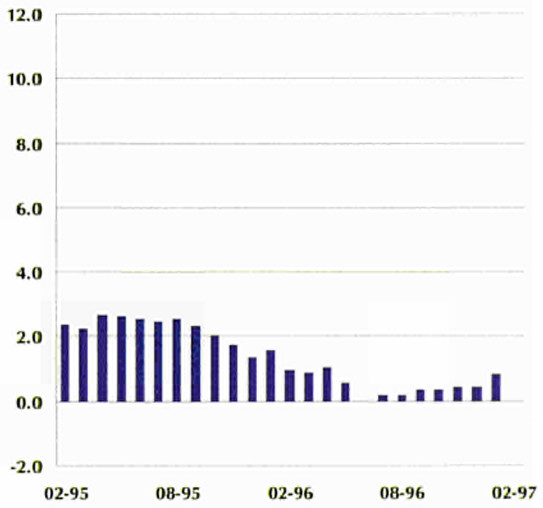
Ellada



España



France



Source: eurostat

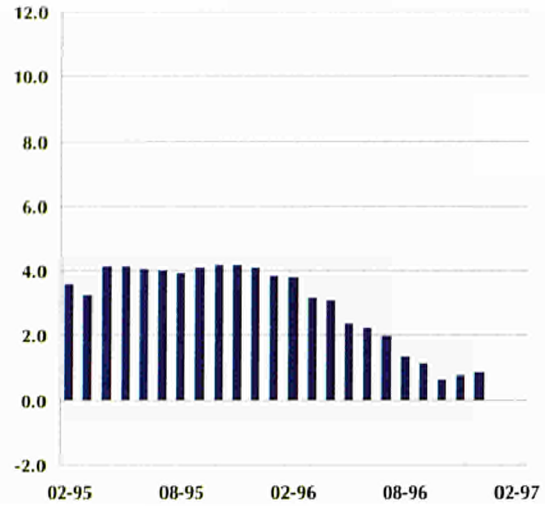
eurostat

DOMESTIC PRODUCER PRICE INDEX

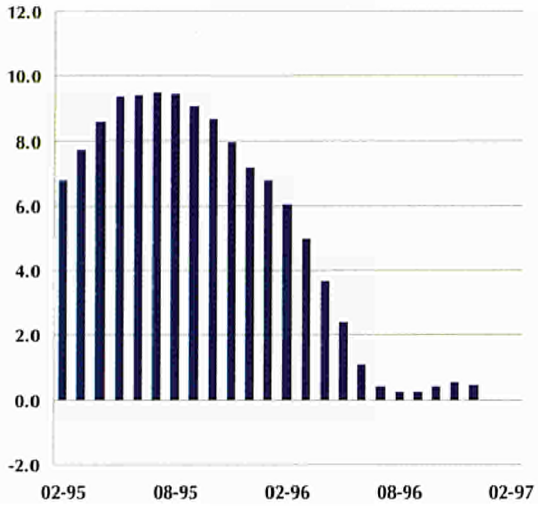
Figure 2.14

Annual growth rates of producer prices for total industry, in national currency (%)

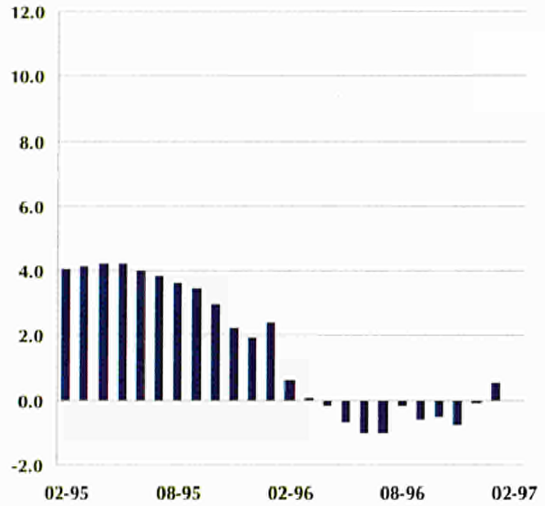
Ireland



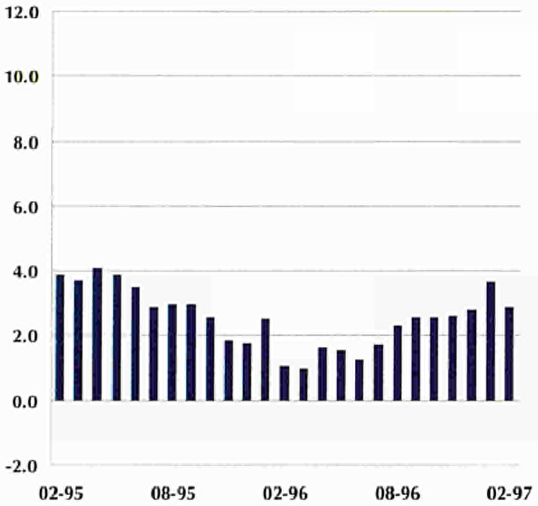
Italia



Luxembourg



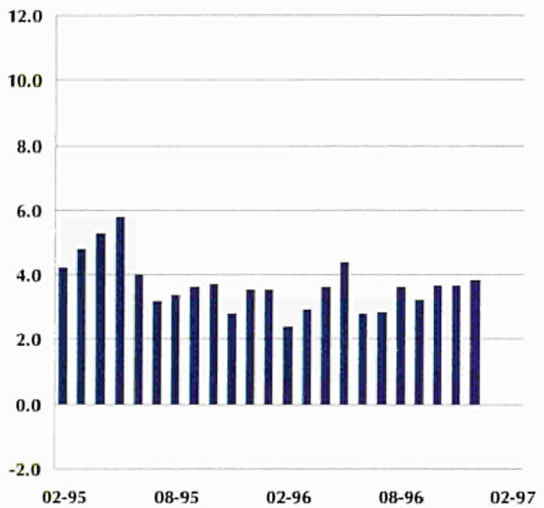
Nederland



Österreich

Not available

Portugal

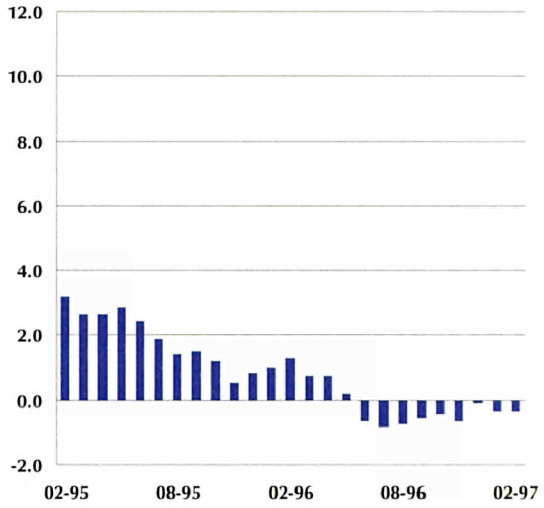


Source: eurostat

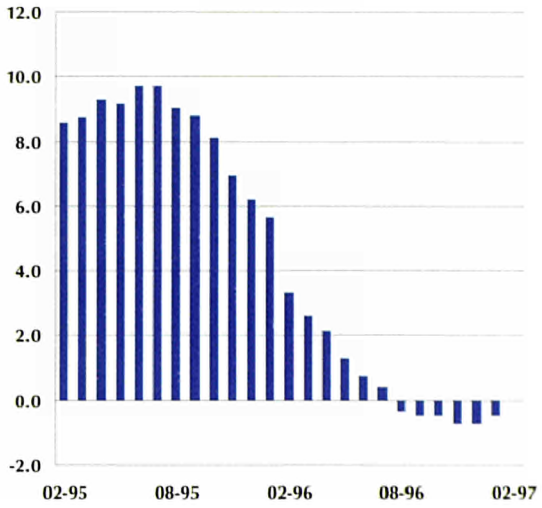
Figure 2.14

Annual growth rates of producer prices for total industry, in national currency (%)

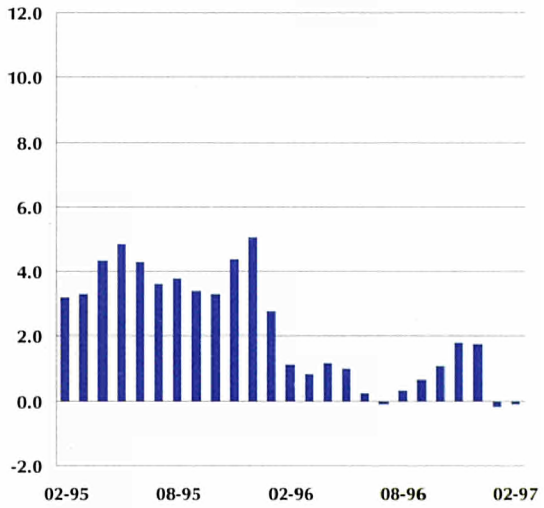
Suomi / Finland



Sverige



United Kingdom



Further information - price indices:

The index of producer prices shows (in the national currency of the Member State in question) changes in the ex-works selling prices of all products sold on the domestic market. Since we deal with producer prices, imports are not included in these price indices. The Community indices (EUR13, since there are no producer price indices for Portugal and Austria) refer to overall weighted price changes. Producer price indices are not seasonally adjusted.

The system used for the collection of export price indices is a duplicate of the model for domestic producer price indices.

All data from Ireland is converted to NACE Rev.1 from the old classification NACE 1970 and is therefore less reliable.

Full methodological notes may be found on page 71.

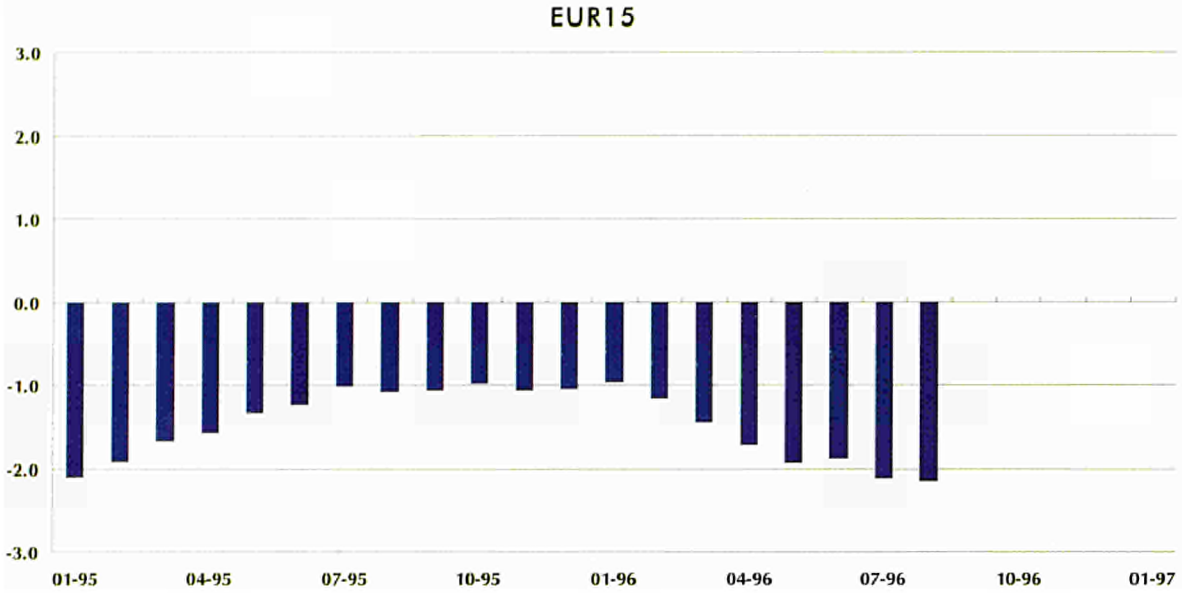
Source: eurostat

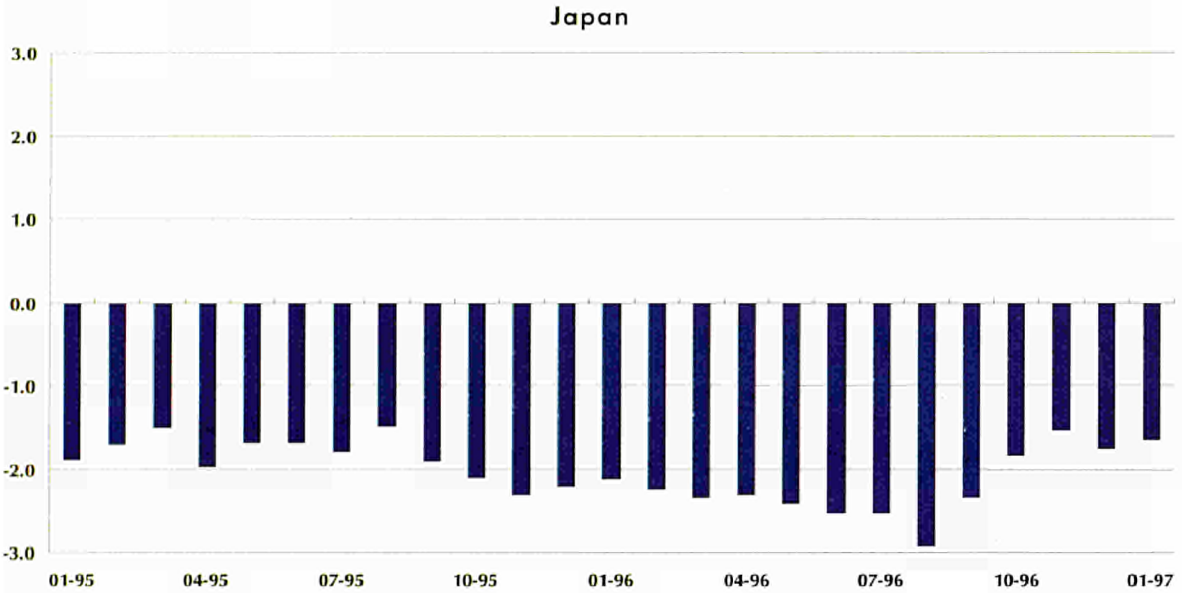
eurostat

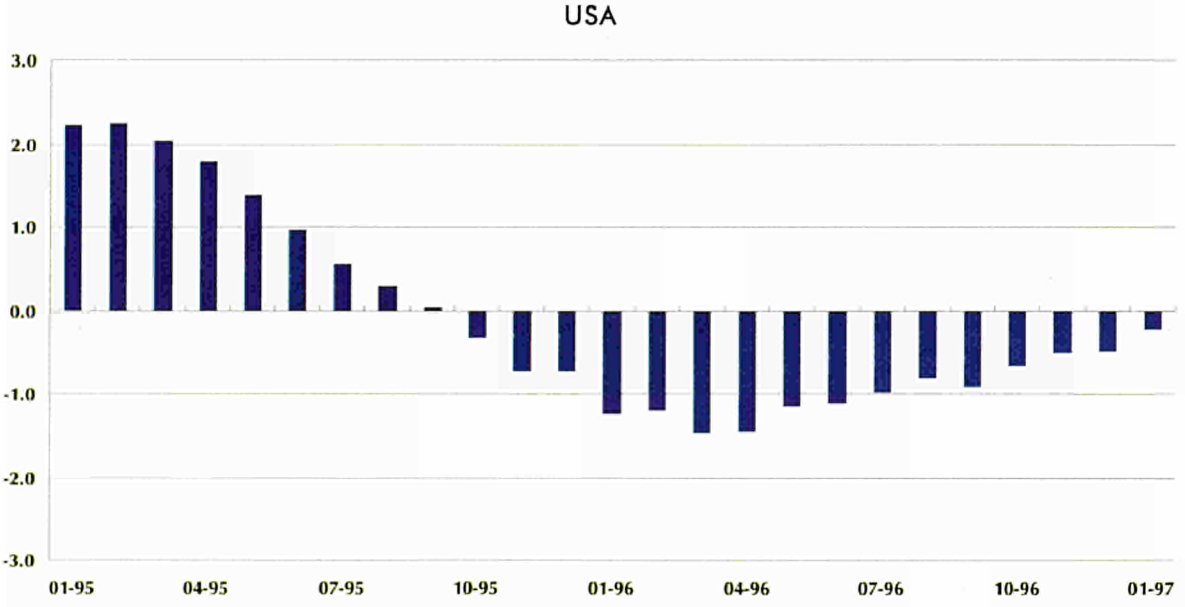
EMPLOYMENT INDEX - GROSS DATA

Figure 2.15

TRIAD comparison of annual growth rates of employment for total industry, gross data (%)



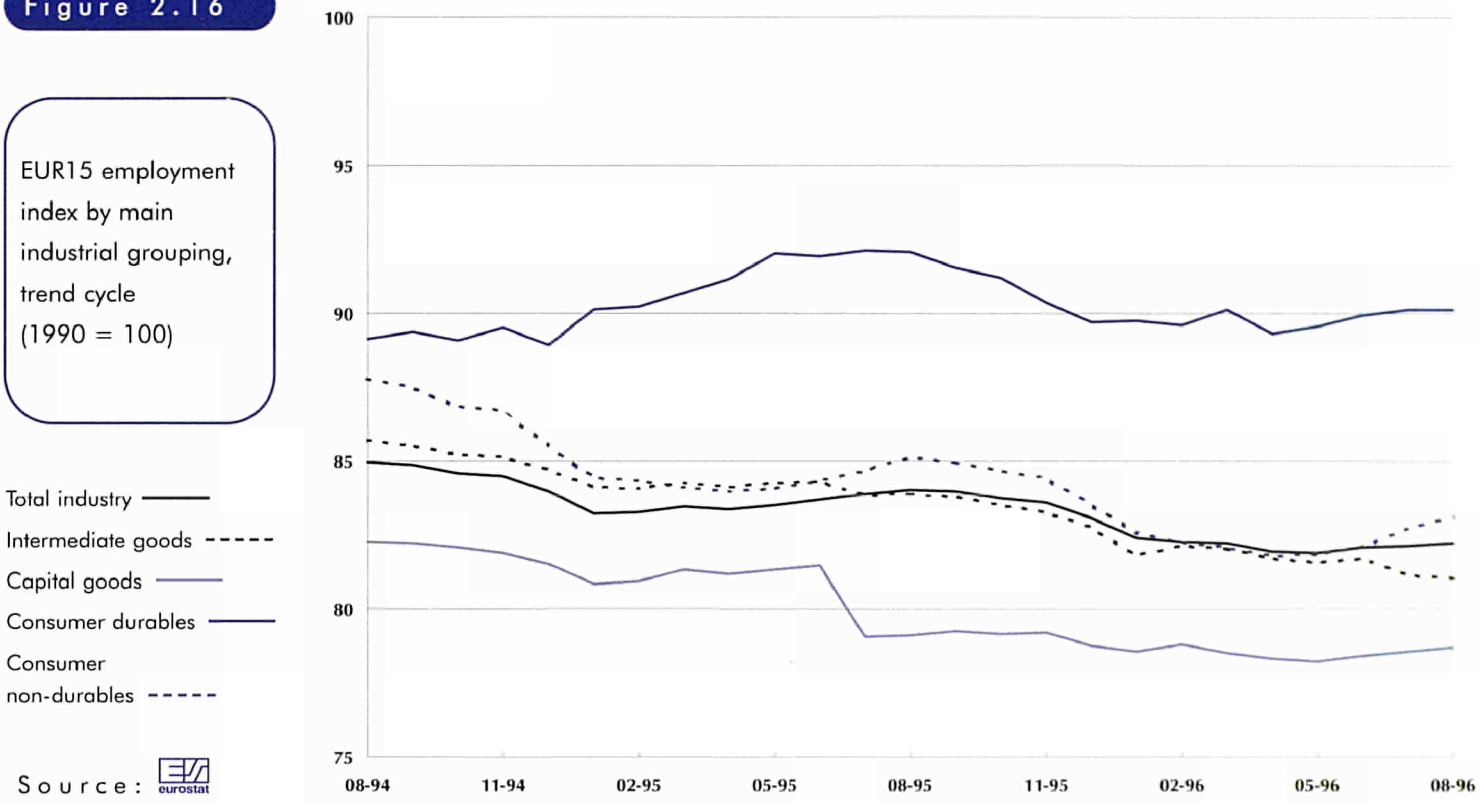




Source: eurostat

Figure 2.16

EUR15 employment index by main industrial grouping, trend cycle (1990 = 100)



Source: eurostat

Table 2.12

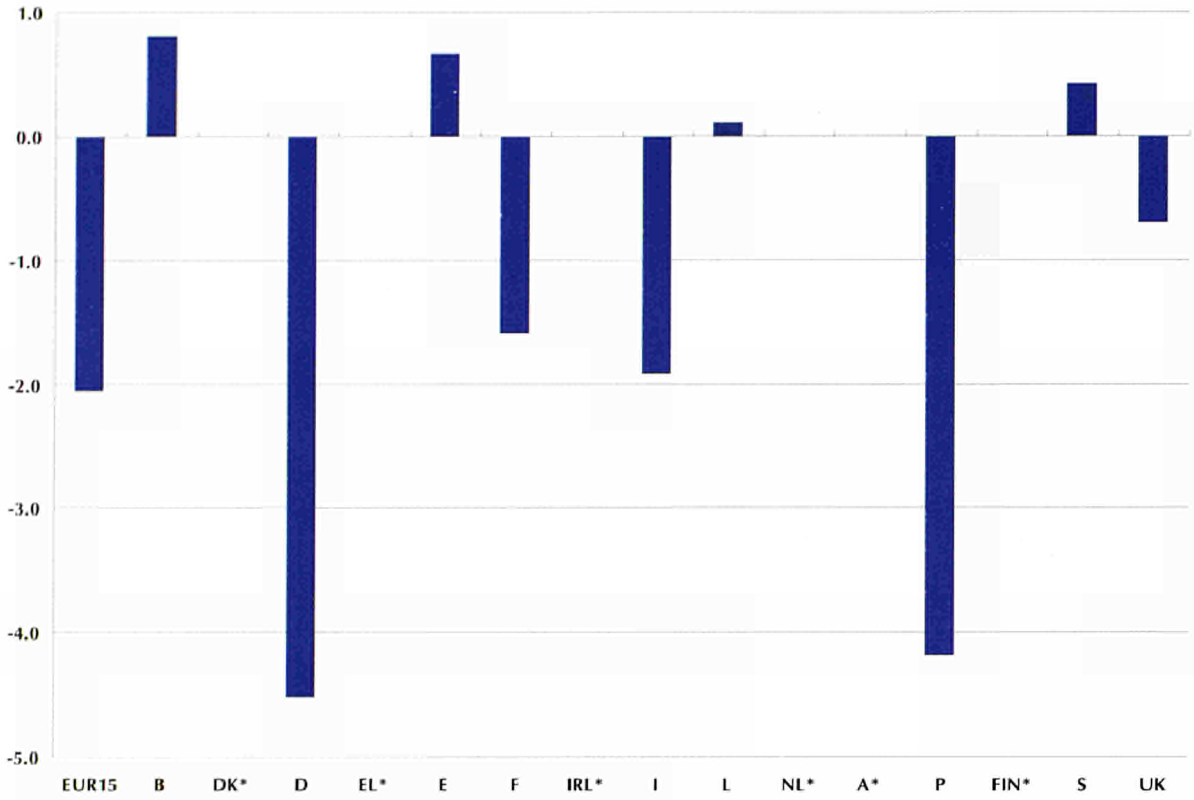
Three month on three month growth rates for the employment index of the main industrial groupings, trend cycle (%)

	Latest 3 months available			Total industry	Intermediate goods	Capital goods	Consumer durables	Consumer non-durables
EUR15	06-96	⇨	08-96	-0.5	-1.0	-0.1	-0.4	-0.6
B	06-96	⇨	08-96	0.1	-0.2	-0.1	:	:
DK	10-93	⇨	12-93	0.2	0.6	-0.3	:	0.0
D	09-96	⇨	11-96	-1.3	-1.8	-1.1	-1.9	-0.9
EL	01-96	⇨	03-96	-0.7	-1.7	-3.2	-1.3	0.1
E	07-96	⇨	09-96	2.0	1.0	4.0	2.7	0.7
F	10-96	⇨	12-96	-0.4	-0.7	0.1	-0.6	-0.7
IRL	01-96	⇨	03-96	1.4	0.3	4.3	:	:
I	06-96	⇨	08-96	-0.5	-1.1	-0.4	0.4	-0.9
L	10-96	⇨	12-96	-0.6	-0.9	0.7	-2.6	-0.2
NL	10-94	⇨	12-94	-0.3	-0.7	:	:	-0.7
A	10-95	⇨	12-95	-1.0	-0.9	-0.8	1.9	-2.7
P	10-96	⇨	12-96	-0.9	-0.4	-1.3	-0.2	-1.0
FIN		⇨		:	:	:	:	:
S	10-96	⇨	12-96	-0.8	:	:	:	:
UK	11-96	⇨	01-97	0.1	0.0	0.5	-0.9	0.1
Japan	11-96	⇨	01-97	-0.2	:	:	:	:
USA	11-96	⇨	01-97	0.1	:	:	:	:

Source: eurostat

EMPLOYMENT INDEX - GROSS DATA

Figure 2.17



Annual growth rates for the employment index of total industry, based on changes from the corresponding three months of the previous year, gross data, June-96 to Aug-96 (%)

Source: eurostat

Table 2.13

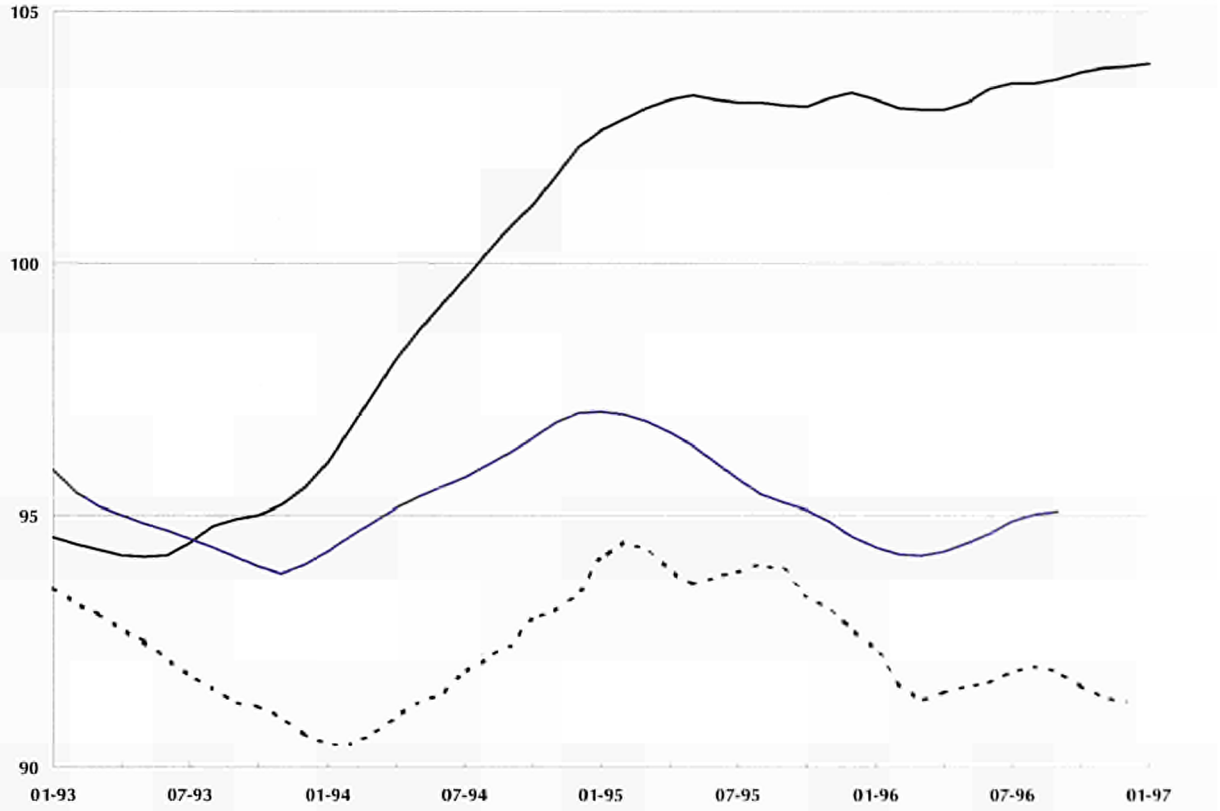
	Latest 3 months available			Total industry	Intermediate goods	Capital goods	Consumer durables	Consumer non-durables
EUR15	06-96	⇨	08-96	-2.1	-3.2	-1.6	-2.1	-2.4
B	06-96	⇨	08-96	0.8	0.4	2.1	:	:
DK	10-93	⇨	12-93	-4.0	-3.4	-7.5	:	-1.6
D	09-96	⇨	11-96	-4.8	-6.5	-3.6	-8.3	-3.5
EL	01-96	⇨	03-96	-2.0	-1.6	4.1	-4.2	-3.8
E	10-96	⇨	12-96	1.4	-0.8	3.6	4.2	1.1
F	10-96	⇨	12-96	-1.8	-2.3	-0.7	-2.4	-2.3
IRL	01-96	⇨	03-96	5.1	3.6	16.1	:	:
I	06-96	⇨	08-96	-1.9	-4.3	-2.0	1.3	-3.7
L	10-96	⇨	12-96	-0.7	-0.4	2.1	-8.3	-3.6
NL	10-94	⇨	12-94	-2.8	:	:	:	-4.4
A	10-95	⇨	12-95	-2.0	-0.9	-5.3	7.5	-11.8
P	10-96	⇨	12-96	-4.3	-4.1	-3.8	2.2	-5.3
FIN		⇨		:	:	:	:	:
S	10-96	⇨	12-96	-1.4	:	:	:	:
UK	11-96	⇨	01-97	-1.0	0.4	2.1	-3.6	-0.4
Japan	11-96	⇨	01-97	-1.7	:	:	:	:
USA	11-96	⇨	01-97	-0.4	:	:	:	:

Annual growth rates for the employment index of the main industrial groupings, based on changes from the corresponding three months of the previous year, gross data (%)

Source: eurostat

Figure 2.18

EUR15 production and employment trends in construction, trend cycle (1990 = 100)



Total industry: production index ——

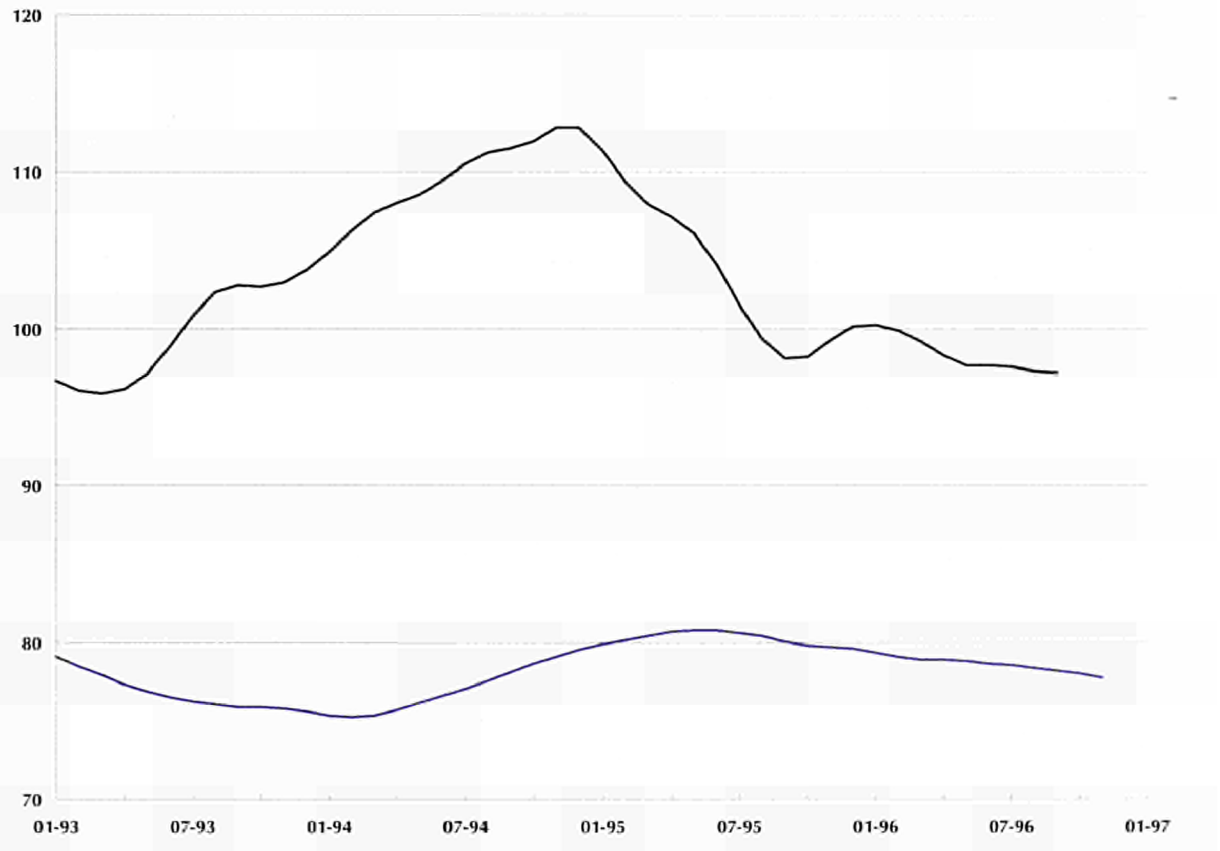
Construction: production index ——

Construction: employment index - - - - -

Source: eurostat

Figure 2.19

EUR15 building permits, trend cycle (1990 = 100)



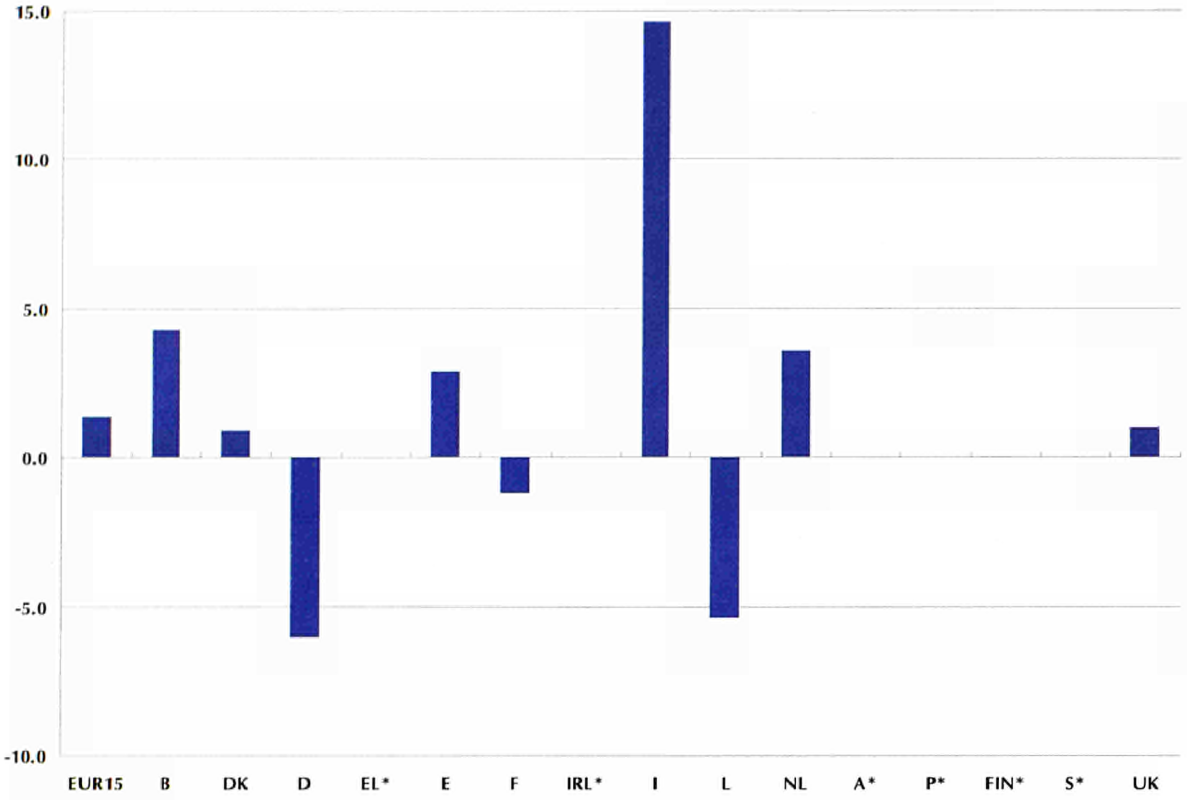
Residential ——

Non-residential ——

Source: eurostat

PRODUCTION INDEX

Figure 2.20



Annual growth rates for the production index of construction activity, based on changes from the corresponding three months of the previous year, w.d.adj., Jul-96 to Sep-96 (%)

Source: eurostat

Table 2.14

	Latest 3 months available			Building t / t-1	Building t / t-4	Latest 3 months available			Civil engineering t / t-1	Civil engineering t / t-4
EUR15	07-96	⇨	09-96	0.1	0.0	10-96	⇨	12-96	0.0	-3.1
B	09-94	⇨	11-94	4.1	14.0	09-94	⇨	11-94	6.2	24.4
DK	10-96	⇨	12-96	-3.0	-2.2	10-96	⇨	12-96	-2.9	-6.1
D	11-96	⇨	01-97	-1.5	-2.7	11-96	⇨	01-97	-8.0	-5.2
EL		⇨		:	:		⇨		:	:
E	10-96	⇨	12-96	-2.9	2.9	10-96	⇨	12-96	-5.6	-4.4
F	11-96	⇨	01-97	-5.1	-12.0	11-96	⇨	01-97	-2.8	-7.2
IRL		⇨		:	:		⇨		:	:
I	10-96	⇨	12-96	1.4	3.8	10-96	⇨	12-96	9.3	-1.0
L	10-96	⇨	12-96	-1.8	-7.0	10-96	⇨	12-96	-1.1	-8.5
NL	07-96	⇨	09-96	2.6	-1.4		⇨		:	:
A		⇨		:	:		⇨		:	:
P		⇨		:	:		⇨		:	:
FIN	04-96	⇨	06-96	-1.0	-1.7	04-96	⇨	06-96	5.0	4.9
S		⇨		:	:		⇨		:	:
UK	07-96	⇨	09-96	0.5	1.7	07-96	⇨	09-96	-0.5	-5.4

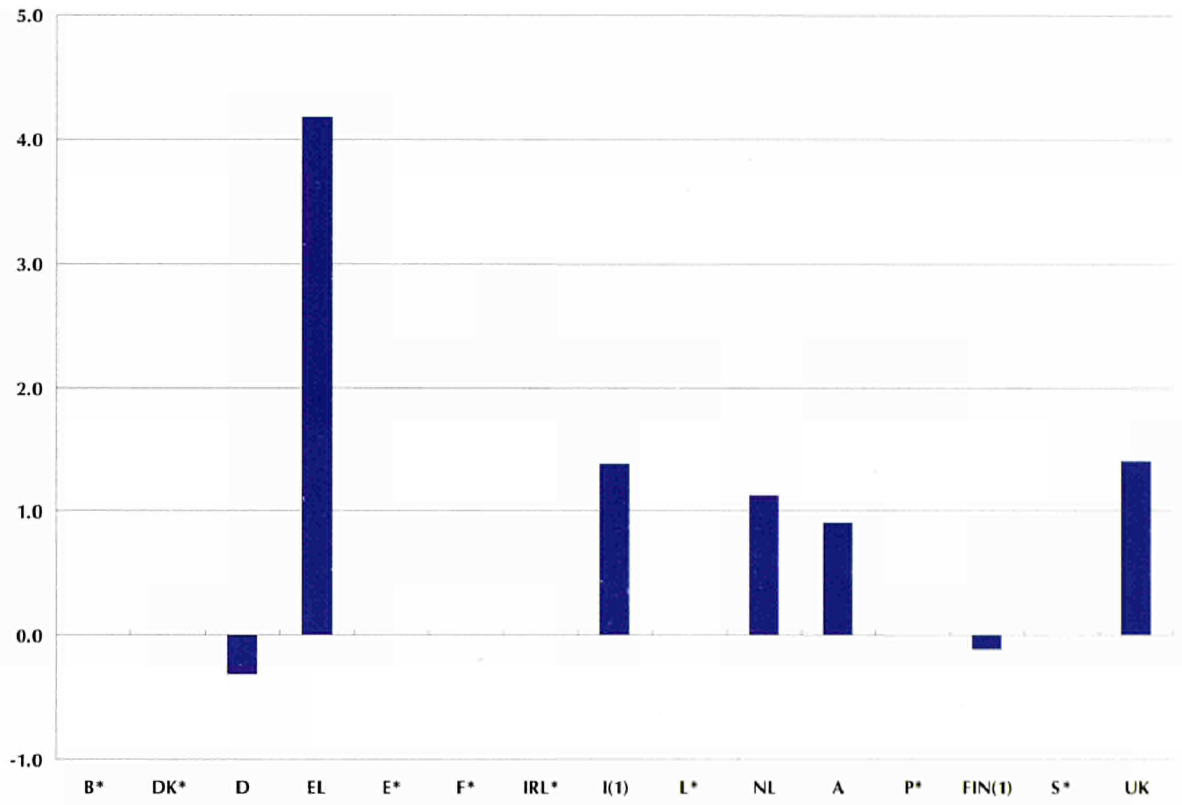
Latest growth rates for the production index of construction (%)

Source: eurostat

PRICE INDICES FOR NEW RESIDENTIAL BUILDINGS

Figure 2.21

Annual growth rates of output prices for new residential buildings, based on changes from the corresponding quarter of the previous year, Jul-96 to Sep-96 (%)



(1) Input prices

Source: eurostat

Table 2.15

Output price indices for new residential buildings, quarterly data (1990 = 100)

	I-1995	II-1995	III-1995	IV-1995	I-1996	II-1996	III-1996	IV-1996
EUR15	:	:	:	:	:	:	:	:
B	:	:	:	:	:	:	:	:
DK (1)	113.4	115.1	116.0	116.8	117.6	:	:	:
D	123.1	124.5	124.6	124.5	124.2	124.2	124.1	123.8
EL	160.0	161.7	163.0	165.9	170.3	171.7	172.8	174.7
E	:	:	:	:	:	:	:	:
F	106.5	107.7	107.8	106.7	109.3	108.4	:	:
IRL (1)	115.5	115.7	116.5	117.5	117.4	:	:	:
I (1)	121.7	123.3	123.8	123.9	123.9	124.2	126.3	127.0
L	116.7	116.7	117.7	117.7	118.0	118.0	:	:
NL	118.0	118.0	119.0	119.0	121.0	121.0	121.0	:
A	119.1	120.0	120.5	120.5	121.2	121.8	122.1	:
P	:	:	:	:	:	:	:	:
FIN (1)	102.6	102.4	102.4	102.0	100.8	101.5	102.2	102.7
S	94.1	81.7	99.7	87.7	:	:	:	:
UK	100.2	101.4	102.1	102.4	102.5	102.9	104.0	105.0

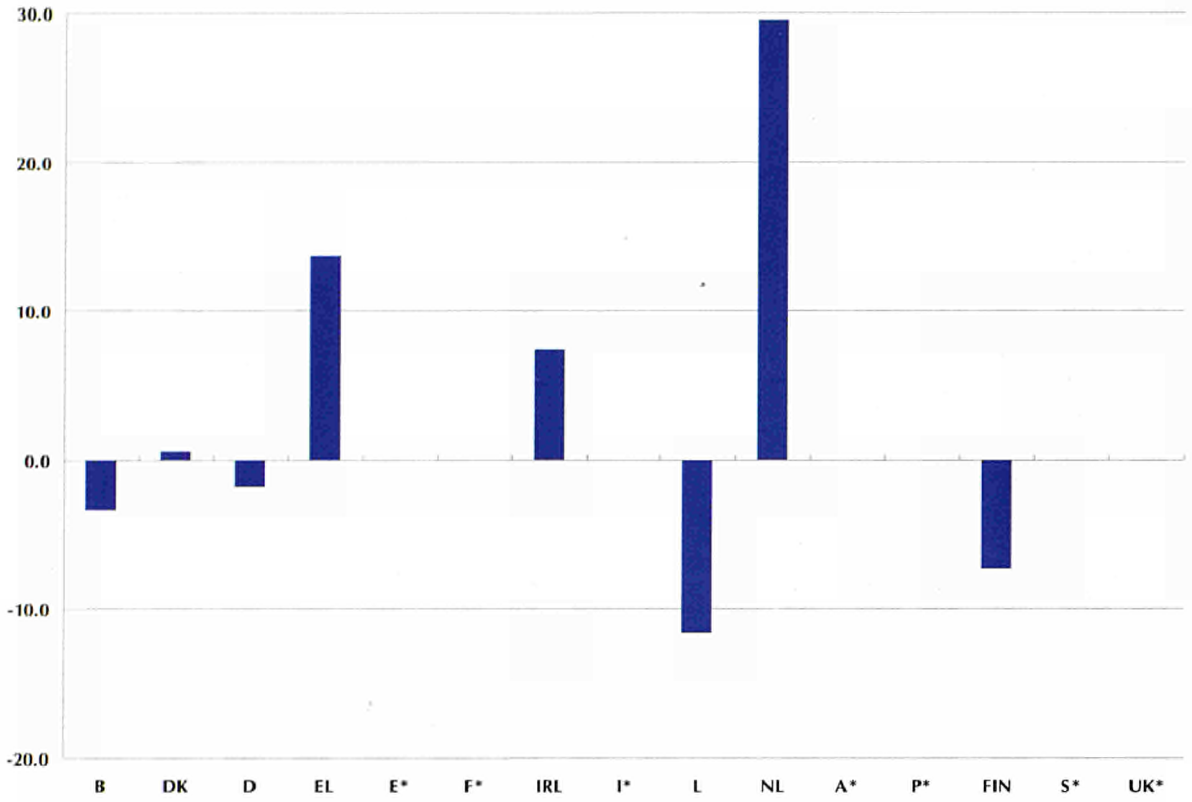
(1) Input prices

Source: eurostat

eurostat

BUILDING PERMITS - USEFUL FLOOR AREA

Figure 2.22



Annual growth rates of building permits (useful floor area), based on changes from the corresponding three months of the previous year, Sep-96 to Nov-96 (%)

Source: eurostat

Table 2.16

	Latest 3 months available			Residential '000m² 1990=100		Latest 3 months available			Non-residential '000m² 1990=100	
EUR15		⇨		:	:	09-96	⇨	11-96	:	78.5
B	09-96	⇨	11-96	2,373	93.5	09-96	⇨	11-96	1,740	68.5
DK	10-96	⇨	12-96	445	108.1	10-96	⇨	12-96	867	68.7
D	10-96	⇨	12-96	12,493	136.4	10-96	⇨	12-96	11,164	116.9
EL	10-94	⇨	12-94	3,054	84.0	10-94	⇨	12-94	1,098	81.8
E	07-96	⇨	09-96	9,689	95.6	07-96	⇨	09-96	1,419	46.4
F		⇨		:	:	10-96	⇨	12-96	7,787	59.4
IRL	10-96	⇨	12-96	1,115	147.4	10-96	⇨	12-96	602	84.2
I	04-96	⇨	06-96	3,144	65.7	04-96	⇨	06-96	5,281	73.2
L	10-96	⇨	12-96	:	85.8	10-96	⇨	12-96	:	48.7
NL	11-96	⇨	01-97	4,389	133.3	11-96	⇨	01-97	4,117	82.9
A		⇨		:	:		⇨		:	:
P		⇨		:	:		⇨		:	:
FIN	11-96	⇨	01-97	:	31.2	11-96	⇨	01-97	:	32.7
S		⇨		:	:		⇨		:	:
UK		⇨		:	:		⇨		:	:

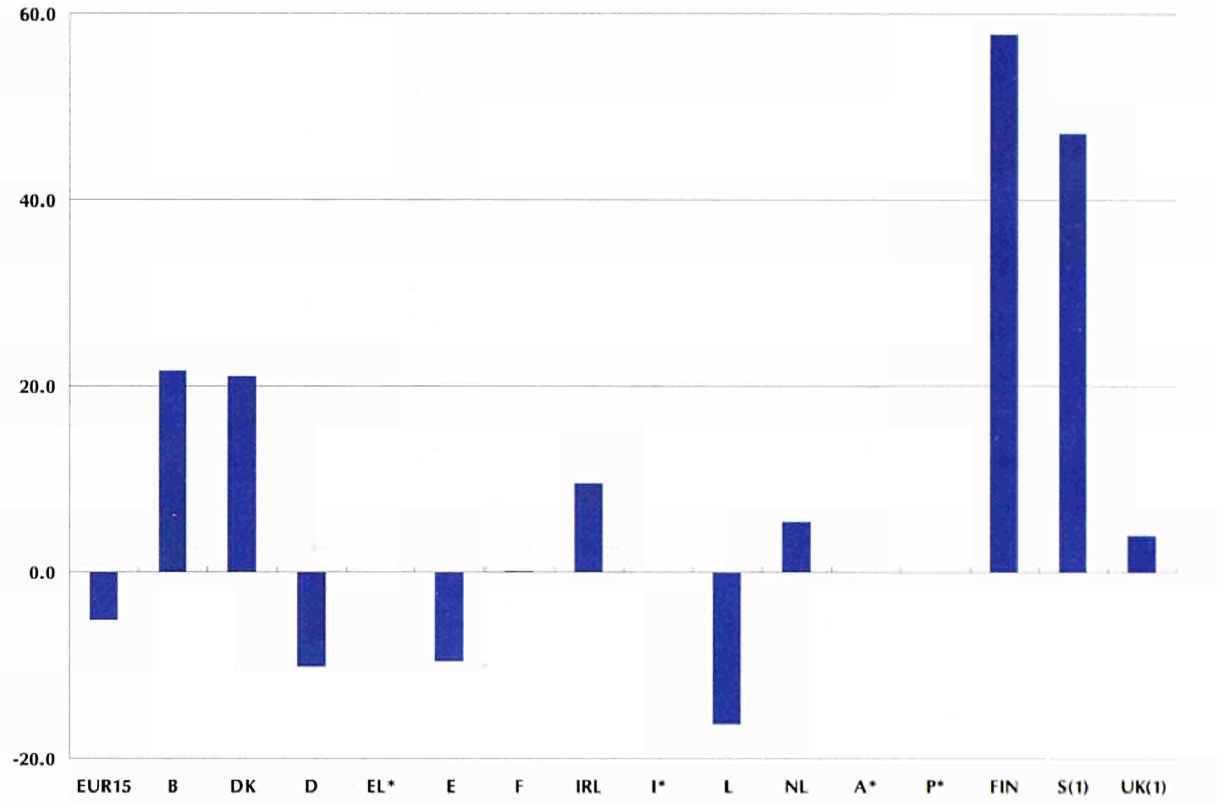
Building permits (useful floor area) for residential and non-residential buildings (thousand square metres and indices)

Source: eurostat

BUILDING PERMITS - NUMBER OF DWELLINGS

Figure 2.23

Annual growth rates of building permits (no. of dwellings), based on changes from the corresponding three months of the previous year, Jul-96 to Sep-96 (%)



(1) Buildings starts

Source: eurostat

Table 2.17

Number of dwellings authorised (units)

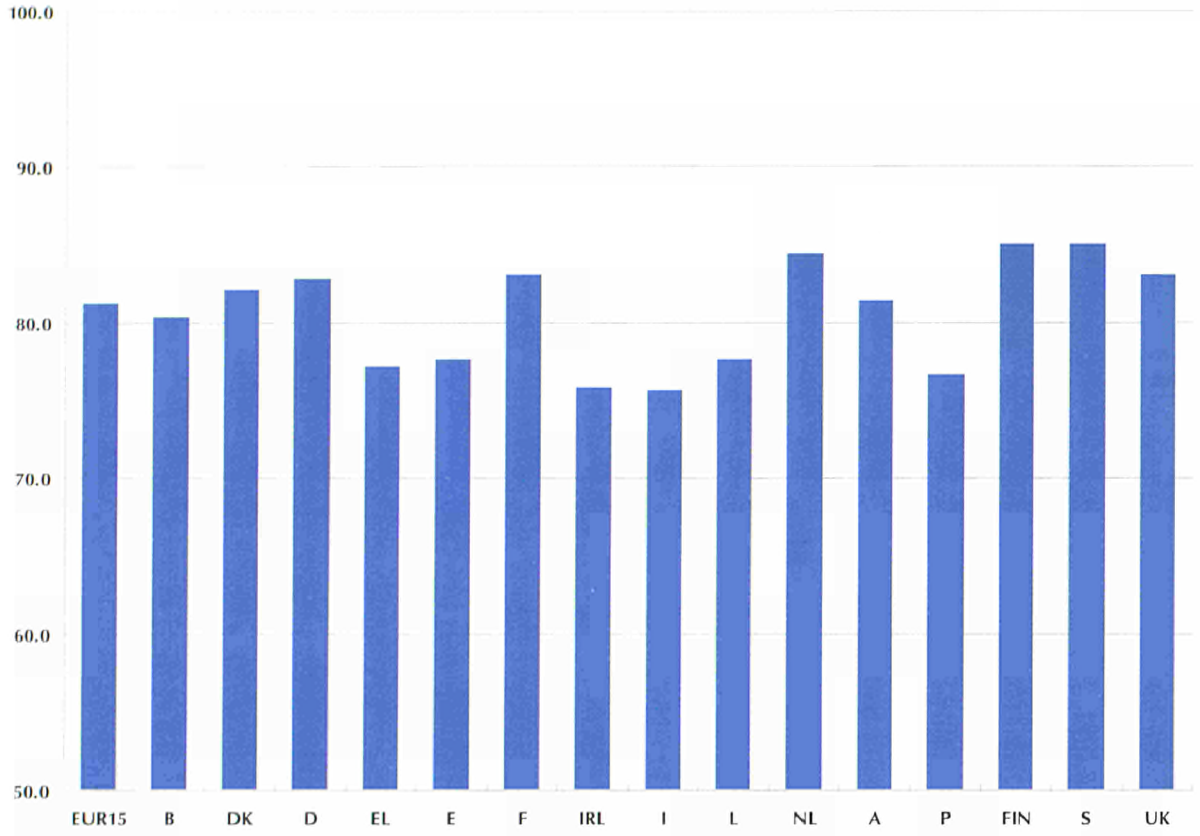
	Latest year available	no. of dwellings	Latest month available	no. of dwellings	no. of dwellings per 1000 inhabitants	Index, 1990 = 100
EUR15		:	09-96	:	:	96.4
B	1995	44,956	11-96	3,210	0.32	73.8
DK	1996	**15,809**	12-96	**878**	**0.17**	**55.1**
D	1996	576,376	12-96	52,570	0.64	159.0
EL	1994	80,607	12-94	11,765	1.13	117.4
E	1995	282,530	09-96	19,800	0.51	101.8
F	1996	304,186	02-97	21,900	0.38	68.4
IRL	1996	34,864	12-96	2,718	0.76	147.8
I	1995	**173,608**	06-96	**11,000**	**0.19**	**62.7**
L	1996	2,797	12-96	619	1.52	195.7
NL	1996	102,119	01-97	6,164	0.40	82.4
A		:		:	:	:
P	1995	76,946	11-96	7,436	0.75	:
FIN	1996	24,966	01-97	1,535	0.30	31.4
S (1)	1995	12,044	09-96	699	0.08	12.0
UK (1)	1996	172,900	01-97	17,000	0.29	124.3

(1) Buildings starts

Source: eurostat

CAPACITY UTILISATION RATES

Figure 2.24



Capacity utilisation rates for total industry, fourth quarter 1996 (%)

Source: DG II, Business Survey

Table 2.18

Annual growth rate: latest quarter, t / t-4		I-1996	II-1996	III-1996	IV-1996
EUR15	-1.7	81.8	80.8	81.2	81.2
B	0.1	78.7	79.1	79.7	80.3
DK	0.0	81.0	80.0	82.0	82.0
D	-2.2	83.2	82.0	82.6	82.8
EL	-1.4	76.3	73.5	75.1	77.2
E	-0.3	77.5	76.1	77.1	77.6
F	-3.3	84.4	84.7	84.4	83.0
IRL	-7.8	82.1	74.4	76.3	75.8
I	-2.6	78.5	76.0	75.8	75.6
L	-4.9	78.8	80.7	79.0	77.6
NL	0.2	83.6	83.5	84.2	84.4
A	:	80.2	78.6	80.6	81.4
P	-2.5	77.0	76.8	78.2	76.6
FIN	-1.7	84.0	81.2	83.0	85.0
S	:	:	85.0	85.0	85.0
UK	-1.0	82.9	82.1	82.4	83.0

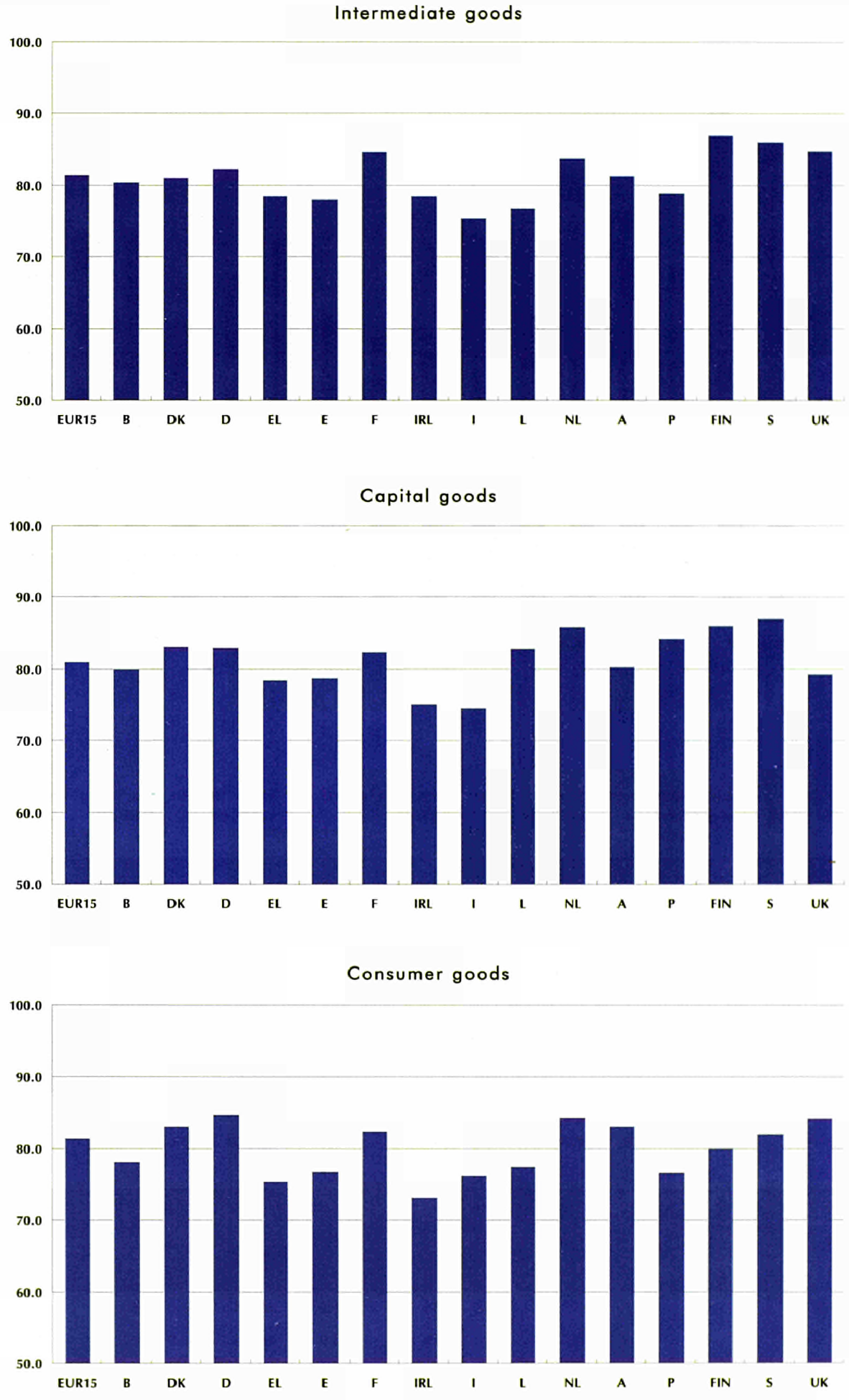
Capacity utilisation rates for total industry (%)

Source: DG II, Business Survey

CAPACITY UTILISATION RATES

Figure 2.25

Capacity utilisation rates for the main industrial groupings, fourth quarter 1996 (%)



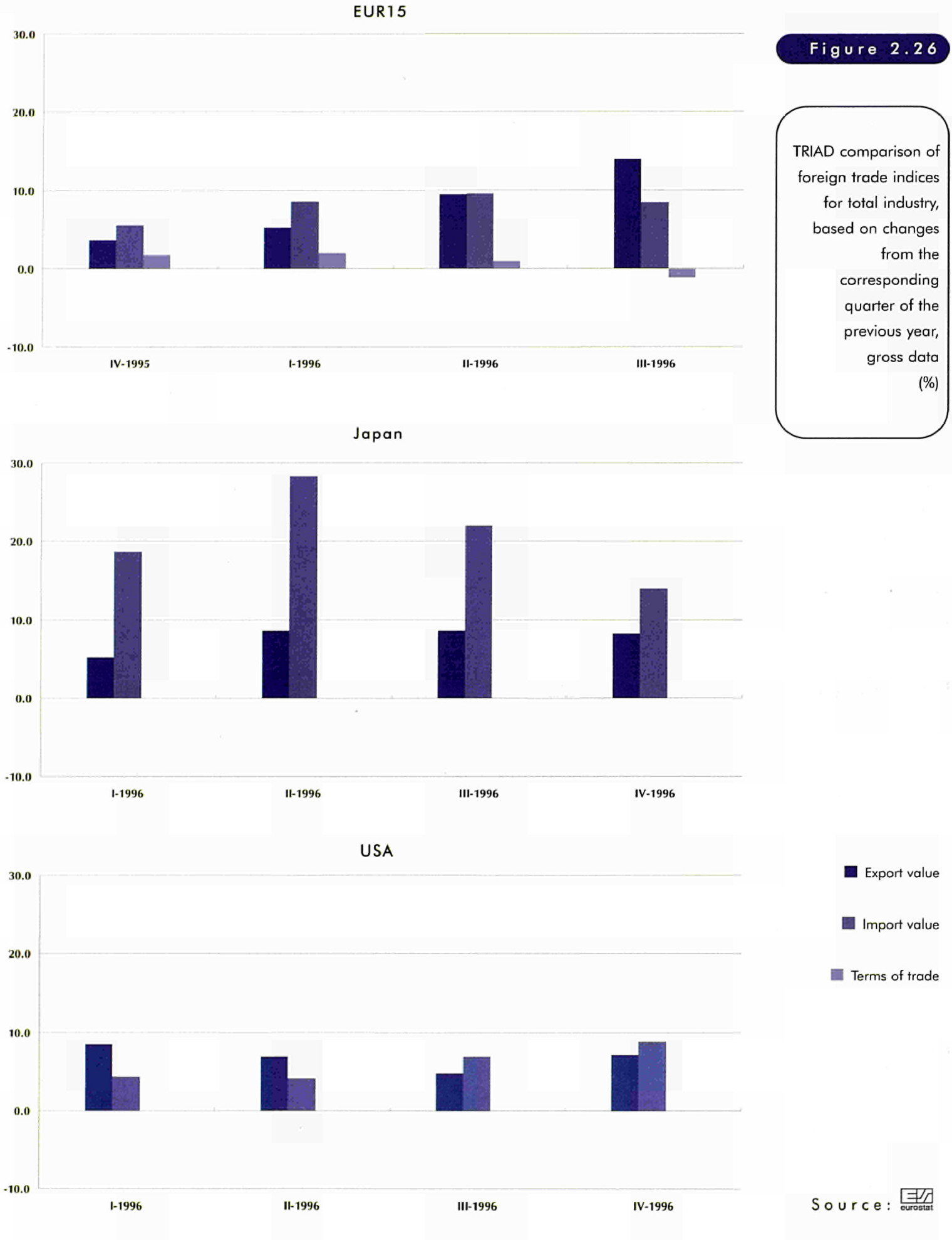
Source: DG II, Business Survey

eurostat

FOREIGN TRADE INDICES - GROSS DATA

Figure 2.26

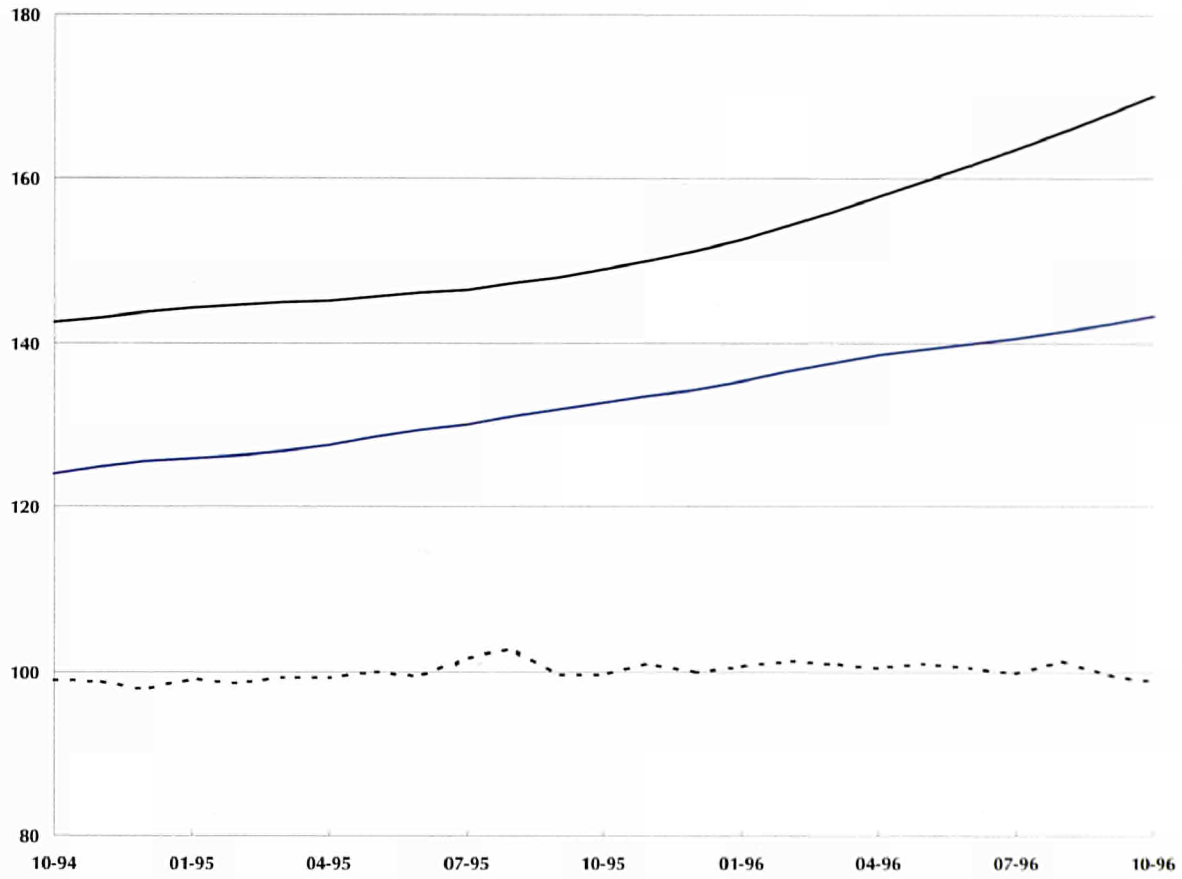
TRIAD comparison of foreign trade indices for total industry, based on changes from the corresponding quarter of the previous year, gross data (%)



Source: eurostat

Figure 2.27

EUR15 foreign trade indices for total industry, trend cycle, in ECU terms (1990 = 100)



Source: eurostat

Table 2.19

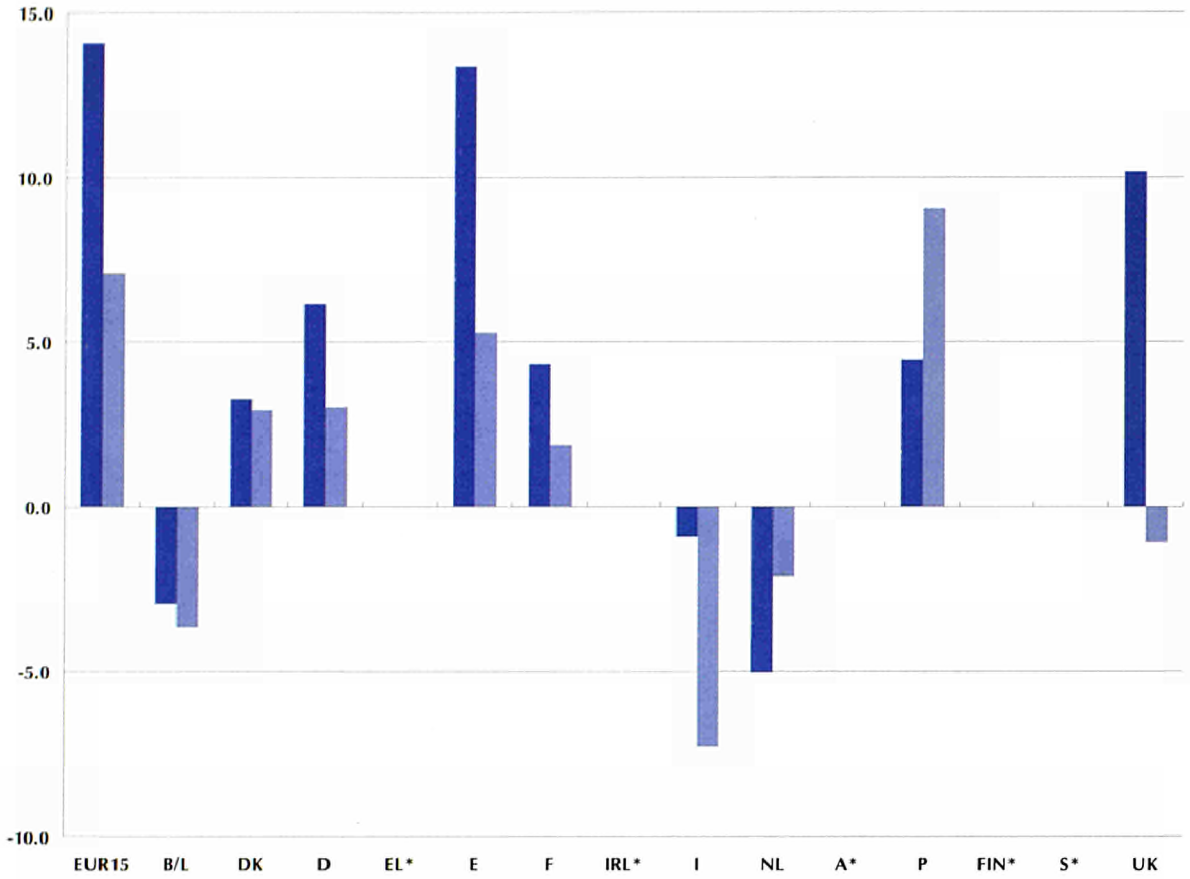
Three month on three month growth rates for foreign trade indices, trend cycle, value indices are in ECU terms (%)

	Latest 3 months available			Exports Value	Exports Volume	Imports Value	Imports Volume	Terms of trade
EUR15	08-96	⇨	10-96	3.9	2.4	1.7	0.7	-0.5
B/L	08-96	⇨	10-96	-0.5	-1.1	-0.5	-1.7	-1.8
DK	08-96	⇨	10-96	2.9	0.6	1.8	1.6	-0.1
D	08-96	⇨	10-96	1.8	1.2	1.7	0.6	0.0
EL	06-96	⇨	08-96	3.8	22.3	1.1	-2.2	5.9
E	08-96	⇨	10-96	5.1	1.8	3.0	1.9	-0.2
F	08-96	⇨	10-96	1.9	1.1	0.9	0.4	-1.0
IRL	07-96	⇨	09-96	1.2	0.1	0.7	-1.0	2.5
I	08-96	⇨	10-96	1.1	1.1	-1.8	0.9	0.6
NL	08-96	⇨	10-96	0.0	-0.7	:	0.7	-0.6
A		⇨		:	:	:	:	:
P	08-96	⇨	10-96	2.4	1.7	3.6	2.6	-0.7
FIN		⇨		:	:	:	:	:
S		⇨		:	:	:	:	:
UK	08-96	⇨	10-96	2.9	1.6	0.4	-0.6	1.0

Source: eurostat

FOREIGN TRADE INDICES - GROSS DATA

Figure 2.28



Annual growth rates for foreign trade indices of total industry, based on changes from the corresponding three months of the previous year, in ECU terms, gross data Aug-96 to Oct-96 (%)

Export value
Import value

Source: eurostat

Table 2.20

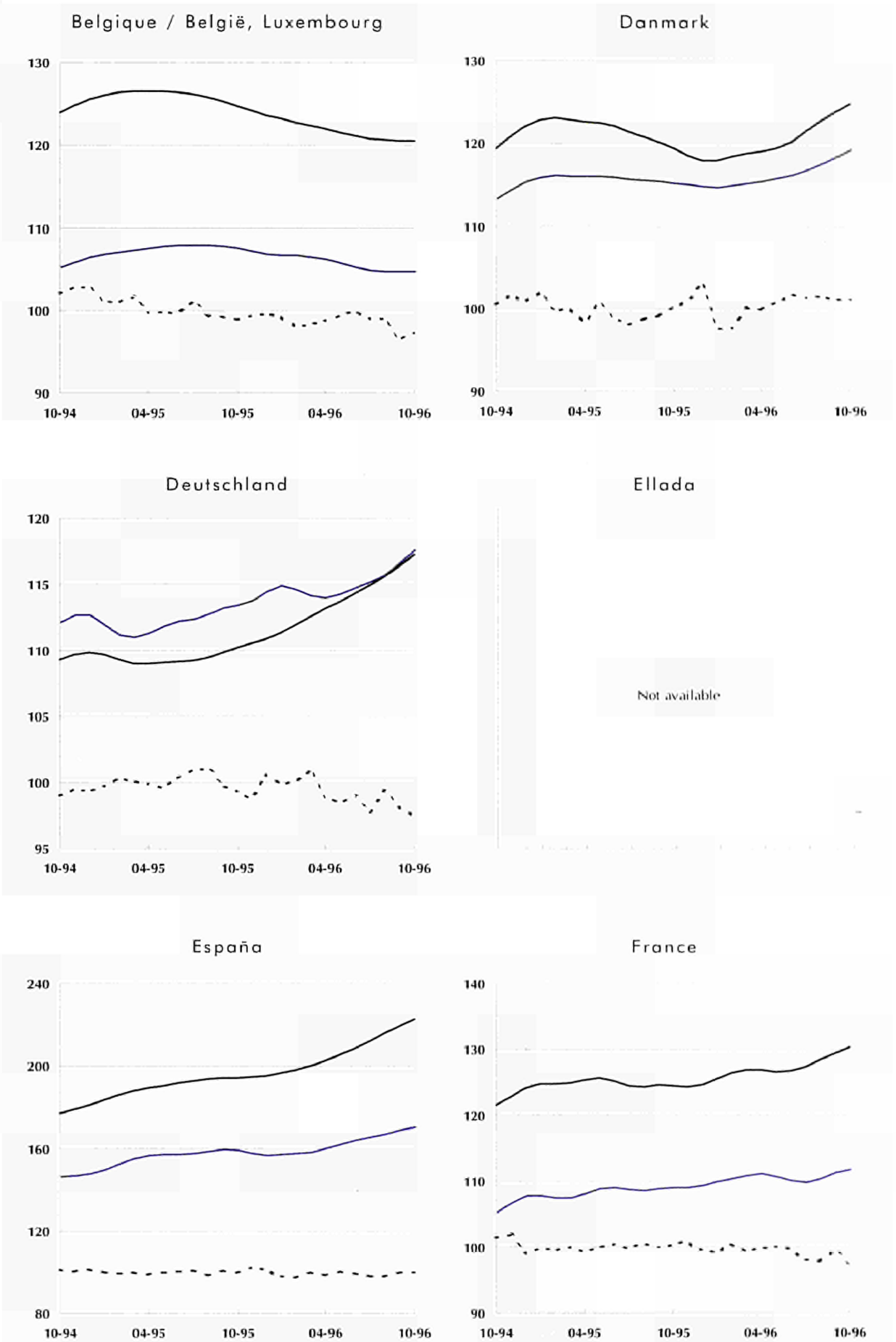
	Latest 3 months available			Exports Value	Exports Volume	Imports Value	Imports Volume	Terms of trade
EUR15	08-96	⇨	10-96	14.1	10.4	7.1	2.9	-0.8
B/L	08-96	⇨	10-96	-3.0	-5.4	-3.7	-7.7	-1.5
DK	08-96	⇨	10-96	3.3	-0.8	2.9	0.7	1.9
D	08-96	⇨	10-96	6.2	5.9	3.0	0.9	-1.7
EL	06-96	⇨	08-96	:	:	:	:	:
E	08-96	⇨	10-96	13.3	12.2	5.2	3.7	-0.5
F	08-96	⇨	10-96	4.3	4.6	1.8	0.1	-2.1
IRL	07-96	⇨	09-96	8.5	5.4	4.6	-1.8	-3.1
I	08-96	⇨	10-96	-0.9	1.6	-7.3	-2.0	3.1
NL	08-96	⇨	10-96	-5.0	-5.7	-2.1	-2.9	-0.2
A		⇨		:	:	:	:	:
P	08-96	⇨	10-96	4.5	7.5	9.1	6.4	-5.1
FIN		⇨		:	:	:	:	:
S		⇨		:	:	:	:	:
UK	08-96	⇨	10-96	10.2	5.3	-1.1	-3.9	1.7

Annual growth rates for foreign trade indices, based on changes from the corresponding three months of the previous year, value indices are in ECU terms, gross data (%)

Source: eurostat

Figure 2.29

Foreign trade indices in ECU terms, trend cycle (1990 = 100)



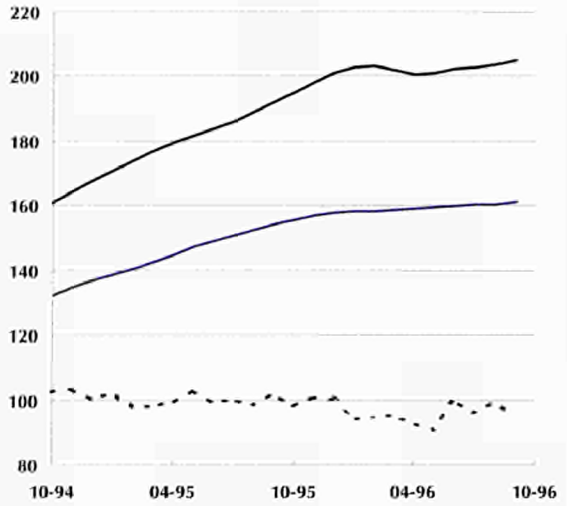
Source: eurostat

FOREIGN TRADE INDICES - TREND CYCLE

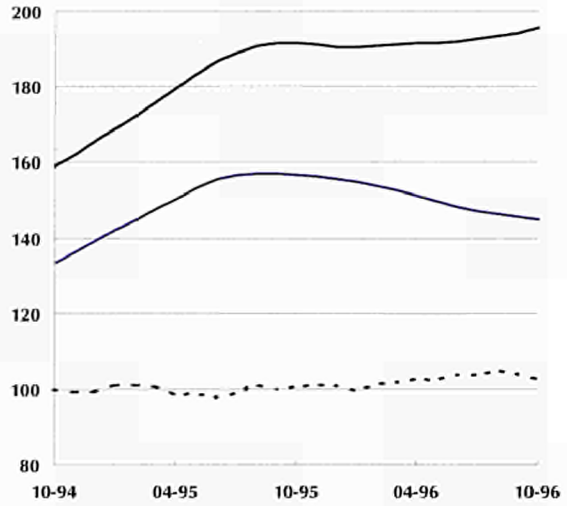
Figure 2.29

Foreign trade indices in ECU terms, trend cycle (1990 = 100)

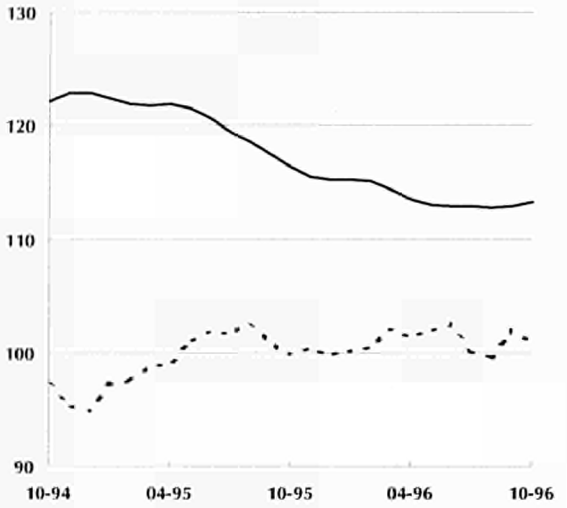
Ireland



Italia



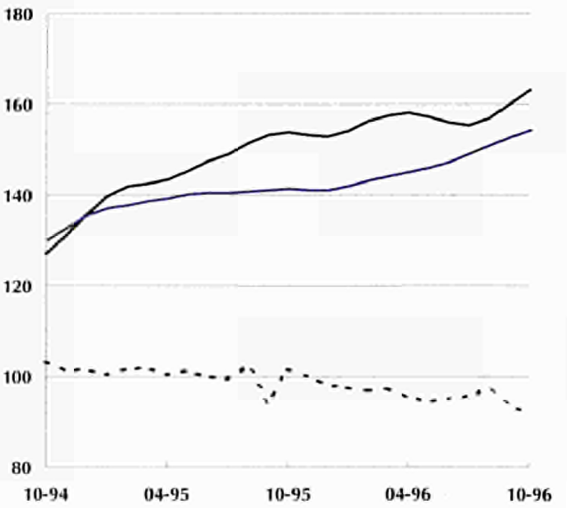
Nederland



Österreich

Not available

Portugal



Suomi / Finland

Not available

Export value index

Import value index

Terms of trade

Source: eurostat

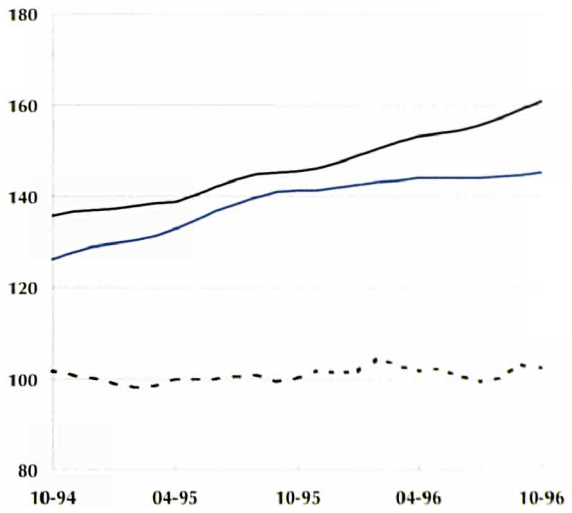
Figure 2.29

Foreign trade indices in ECU terms, trend cycle (1990 = 100)

Sverige

Not available

United Kingdom



Export value index ——

Import value index ——

Terms of trade - - - - -

Further information - employment, construction and trade indices:

Figures showing the number of employees include all persons employed by the firm (manual workers and salaried employees on the firm's payroll).

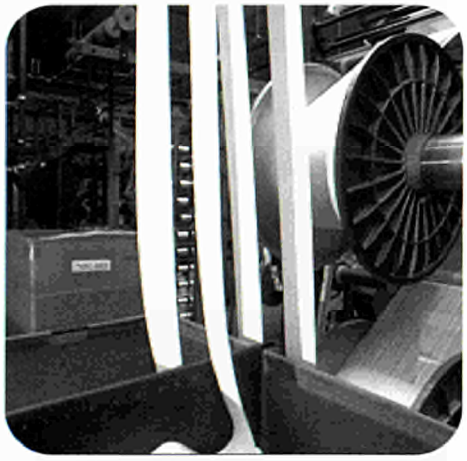
For the construction activity there are some very specific variables: for details of these please refer to the Eurostat publication "Methodology of Industrial Short-term Indicators" - CA-97-96-079-EN-C.

For the indices of imports and exports, foreign trade data of industrial products (following the nomenclature of the Harmonised System) were grouped according to the industrial NACE Rev.1 activity to which they belong. This grouping of products causes inevitably certain inaccuracies which can reduce the reliability of these foreign trade series. The indices for EUR15 refer only to extra-Union trade, the indices for Member States reflect also intra-Union trade.

Full methodological notes may be found on page 71.

Source: eurostat

3 Prospects for mechanical engineering in the EU



In this section

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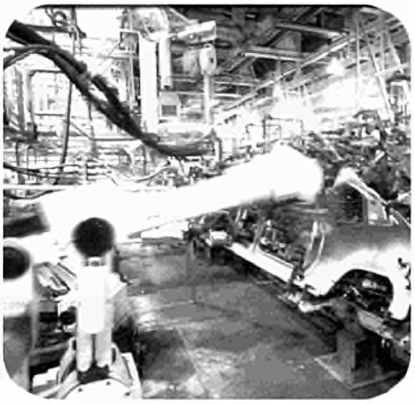


Foreword

The Commission wishes to acknowledge the many valuable ideas and suggestions supplied by VDMA (Verein Deutscher Maschinenbau-Anstalten German Engineering Federation) and in particular Dr H. Kriegbaum - during the writing of this text.

Classification

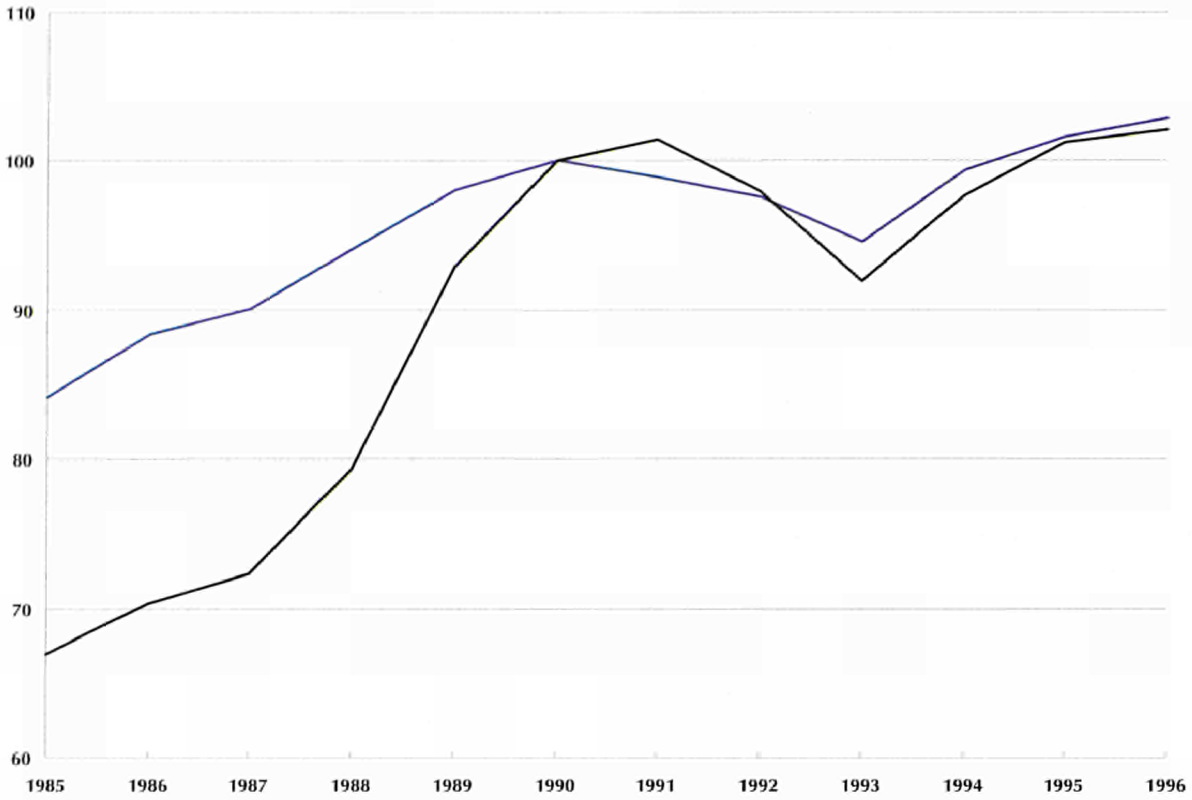
The article is based on the defining criteria of the revised classification of economic activities (NACE Rev.1), which subdivides the mechanical engineering branch into rather more homogeneous classes at four-digit level. But the NACE Rev.1 has been used in statistical surveys in the Member States only since 1994, and there are thus no long time-series of data applying its definitions. A necessary first step was thus to compile a database of appropriate data for the years 1985 to 1996. To this end, data obtained from previously-applied national classifications has been transcoded into the new classification. Such an approach can only be successful if the available data are sufficiently disaggregated. For this attempt, it seemed common-sense first to rely on highly-detailed product data, that is, the statistics of external trade and manufacturing. Most of these data were available until 1994 in the database of VDMA, with missing data then being researched separately. It was possible in this manner to compile time-series for the classes of machine construction as set out in the NACE Rev.1. Estimates for 1995 and 1996 were made by Eurostat. These series can be taken as a good approximation of change which has not been documented directly, and they form the basis of the results presented in the remainder of this article.

General trends

The various branches of mechanical engineering have all changed differently. Change has been for structural reasons, associated with specific forms of dependence. But there are also threads common to most branches, and sometimes to the entire industry. Those result from factors which influence the whole of the engineering industry. To identify the trends specific to individual branches, it is necessary first to take account of this common background. Analysis of the global development of the mechanical engineering branch in the EU performs two functions: first, it enables us to describe the general tendencies, and secondly it provides us with a datum-point from which specific change can be identified.

GENERAL PROSPECTS

Figure 3.1



Evolution of production index (1990 = 100)

Source: VDMA

During the period 85-94, mechanical engineering kept in step with the economic cycle. Almost by definition a supplier of capital goods, the branch follows the economic tide. This is already well-documented. However, the variations recorded over the decade have been wide. With the upswing of 88-90, engineering enterprises had to face a large increase in demand. Subsequently, gradually declining orders resulted in a low point in output in 1993. Real output in the branch rose by 23% between 85 and 90, and fell again by 16% during the next three years. The slight recovery noted since, and through until 1996, has compensated only in part for that decline. All in all, between 85 and 94, i.e. during the period covered by this study, engineering output in the EU grew by 9%.

Internationally, European enterprises have to face competition mainly from the other members of the triad, but must also now look to the newly industrialised nations of Asia and to Central Europe. Between 1992 and 1994 Japan suffered a downturn deeper than that in Europe. In the USA, on the other hand, there was only a slight decline at the start of the 1990s. With these cyclical factors, output in Japan fell by 5% between 1985 and 1994, whilst the United States' rose by 35%.

These differences in growth amongst the triad members are essentially the result of variations in demand on their respective markets. Nevertheless, exports also play their part, as can be seen from the real changes in exports by other triad members. Analysis on the basis of prices and exchange rates shows that United States' mechanical engineering output rose by 47% between 1985 and 1994, whilst Japan's grew by 25% and the EU's by 18%. Exchange rate fluctuations were an important explanatory factor. The cheapness of the dollar favoured US exports, and penalised European and Japanese manufacturers.

European manufacturers are at the leading edge of technology in numerous areas. This is clear from statistics of the number of patents, since the European Union is well ahead of both the USA and Japan in this respect. but detailed analysis of the patent applications shows that Europe's lead is essentially in the domain of engineering know-how, and that there are areas of weakness, notably in micro-electronics, new materials, lasers and microsystems.

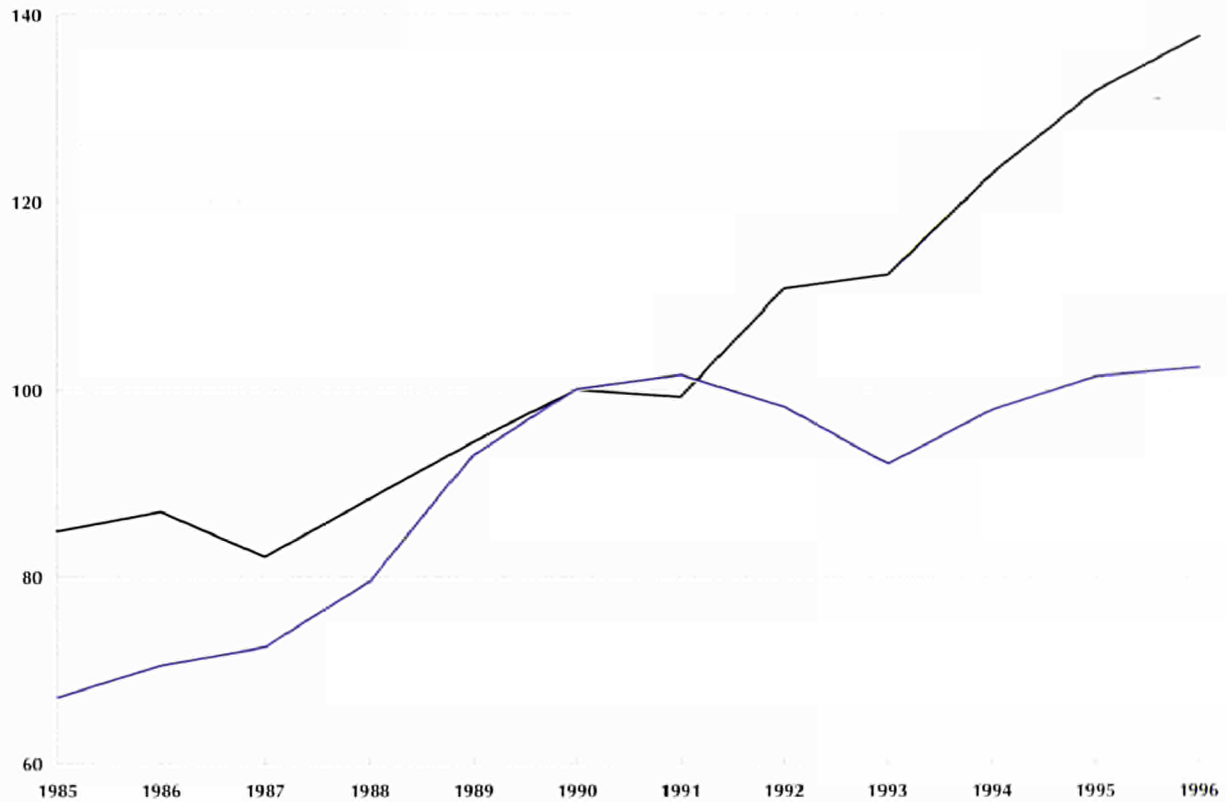
But a recent survey indicates that the Achilles' heel of Europe's engineering industry is nonetheless in its lack of price competitiveness. This problem lies at the root in particular of difficulties in general-purpose machinery, which is particularly sensitive to price fluctuations. During the period under review it is essentially the four tigers of the Asian economy which have been successful in this sector. It must also be noted that the newly-democratic nations of central Europe are beginning to gain a foothold in this market. In special machinery and plant installation it is possible to offset higher prices with other qualities, which explains the generally favourable situation of European Union enterprises in this sector.

Evolution by activity

This article defines the Community mechanical engineering industry as the sum of the 17 four-digit classes of the NACE Rev.1 contained within the three-digit groups numbered from 29.1 to 29.5. Classes 29.24 "Manufacture of other general-purpose machinery" and 29.56 "Manufacture of other special-purpose machinery" are residual groups which cannot be regarded as homogeneous classes of economic activity, and cannot thus be examined individually. The others are examined one by one in the order of the NACE Rev.1.

Figure 3.2

Evolution of production index (1990 = 100)



Source: VDMA

The motors and turbines branch (29.11) comprises machines used to produce and exploit mechanical power, other than machines used to propel agricultural tractors, road vehicles and aircraft. A large proportion of these products are delivered to other manufacturers of capital goods under sub-contracting arrangements. Motors are generally mass-produced, except for very large diesel engines for shipping and other vessels or for generating electricity. Like turbines, these are generally manufactured to order or in short production runs. Compared with the EU engineering industry average, this class comprises a fairly large number of relatively large enterprises. In practice, series production allows overheads to be limited, thus reducing costs. Machines produced one-off virtually count as plant, and thus need bigger production units. The innovative efforts of this branch are directed essentially towards improving productivity and limiting environmental effects.

EU output for this branch in 1994 totalled ECU 10.4 billion, a nominal increase of 45% over 1985. As an increase this was virtually identical to that for the engineering industry as a whole[3]. But there is an interesting discrepancy in the intermediate changes: the value of global production grew steadily until 1991. But the "motors and turbines" branch was hit in 1987, although in contrast it did not suffer during 1992/93. This was essentially due to the growth of exports towards non-member countries, the result in particular of very heavy demand from the Chinese People's Republic for very large diesel engines. However, a one-off improvement in the efficiency of turbines also contributed to an increase in production, with numerous power stations replacing installed capacity earlier than programmed. Modernisation of the antiquated electricity supply system in the new German Länder also produced a temporary surge in demand.

As this branch exports 41% of its production to non-member countries (against 34% for the engineering industry as a whole), it is heavily dependent on external markets. Indeed, the figure slightly understates the true situation, since it takes no account of indirect exports, resulting for example from the fitting of motors to products destined for export. Conversely, imports also have a major role in "motors and turbines". At 28% of the Community market, imports in this branch represent almost double the figure for the engineering industry as a whole. From this we can conclude that the international division of labour is particularly advanced for the "motors and turbines" branch. EU manufacturers are very successful in non-member countries, but non-member countries, Japan in particular, are very difficult competitors on the Community market. It should nonetheless be noted that Japanese exports to the Union essentially comprise deliveries to European subsidiaries of Japanese corporations.

In 1994, EU deliveries to non-member countries represented 35% of all exports by the main exporting countries[4]. The Union thus led Japan (31%) and the USA (26%). During the first half of the 1990s the Union seems to have lost market shares to Japan, the USA and the smaller Asian tigers. But the EU continues to dominate most markets, and even remains slightly ahead in the Far East. The EU has been caught up by Japan for exports to North America, and recently been overtaken by the USA for exports to Latin America.

Statistics on patents shows the Union to be at the leading edge in this domain. The EU is the source of 40% of major patents in engineering, against 35% from the USA and 15% from Japan. As regards small-to-medium-volume diesel engines, price also has a considerable effect on competitiveness. The factor also seems to be favourable to EU manufacturers.

3) These prices cannot be adjusted, the necessary indices not being available.

4) Member States of the EU, USA, Japan, Switzerland, Norway, Canada, Taiwan, South Korea, Hong Kong and Singapore (for the EU, only exports to non-Member countries are taken into account).

The pumps and compressors branch (29.12) covers liquid and vacuum pumps, compressors and hydraulic and pneumatic equipment. A large proportion of the products is sold to manufacturers of machinery and plant as components. Both standard and customised products are manufactured in all these groups. Product innovations in this branch are aimed at machine safety and environmental protection. Small and medium-sized firms are a characteristic feature of this branch, but there also some large EU undertakings with production sites throughout the world.

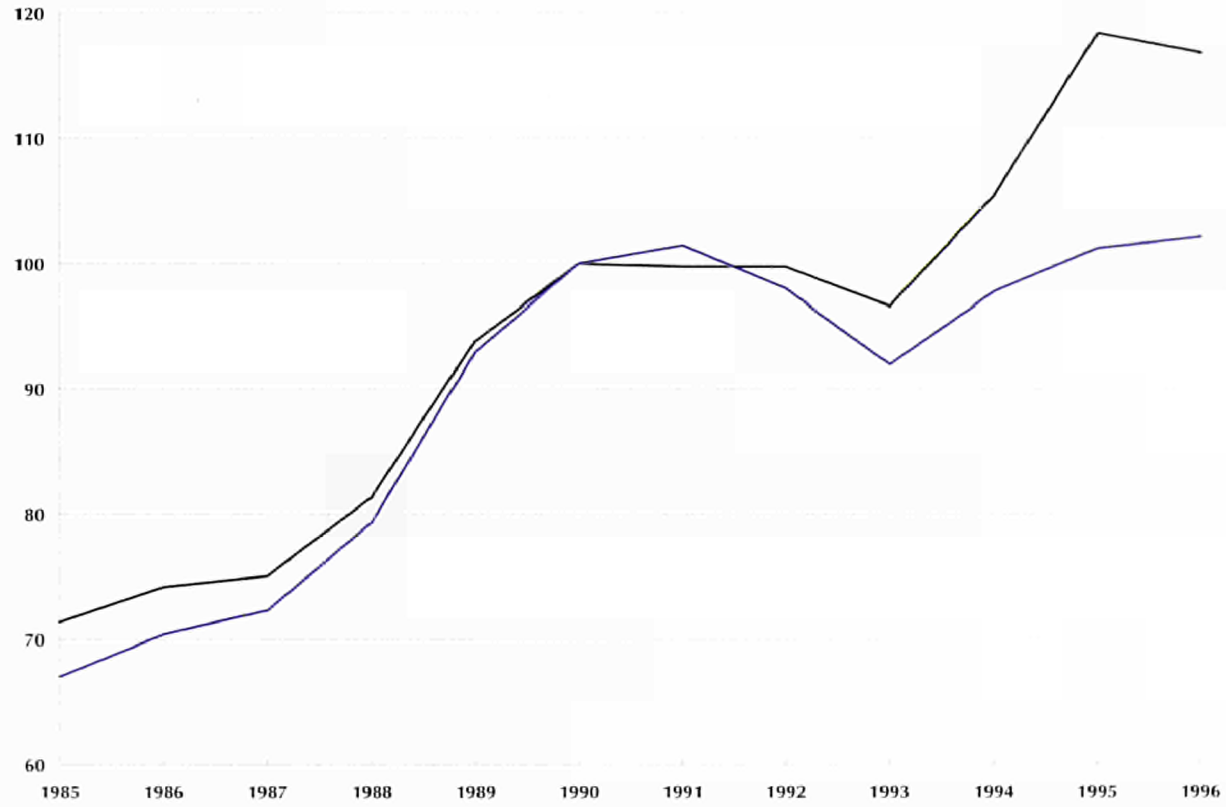
The recession of 1992/93 has not left much of a mark on this branch. First of all there was the strong demand from eastern Germany and then the sharply rising exports to the Far East. Between 1985 and 1994 the value of production in this branch in the EU rose by 48%, i.e. slightly above the average, to ECU 16.9 billion. With an export share of 30% and an import share of 15%, the pattern of external trade in this branch is close to the average for mechanical engineering.

The EU is the largest seller of pumps and compressors on the world market. With an export share of 43%, it was far ahead of the USA (24%), Japan (20%) and Switzerland (6%) in 1994, and EU manufacturers held on to this share during the whole of the reference period. They hold a dominant position in almost all regions of the world. It is only in the Far East that they lag behind Japan, and in Latin America behind the USA, although they have reduced the gap slightly in both markets.

In this branch as well, EU undertakings are world leaders in the technology. Some 40% of all patents of relevance to the branch come from the EU, while the USA and Japan account for only some 25% each. In recent years the NICs in the Far East have also appeared in the patent statistics. Although their share is only 3%, this is considerable development in view of the price competitiveness of these countries. Overall, however, it is surprising that manufacturers from the EU are maintaining their position on the world market not just in special products, such as those required for power stations and the

Figure 3.3

Evolution of production index (1990=100)



Source: VDMA

chemical industry. They have also met the challenge for standard products, where price plays a major role.

Products in the taps and valves branch (29.13) can be subdivided into domestic and industrial taps and valves. Serial production is the norm here, and production of very large series is often possible in the case of sanitary taps and valves. This is why large manufacturers have become established in the EU alongside a large number of small and medium-sized firms. Innovative developments in this branch derive above all from the integration of microelectronics and sensor technology.

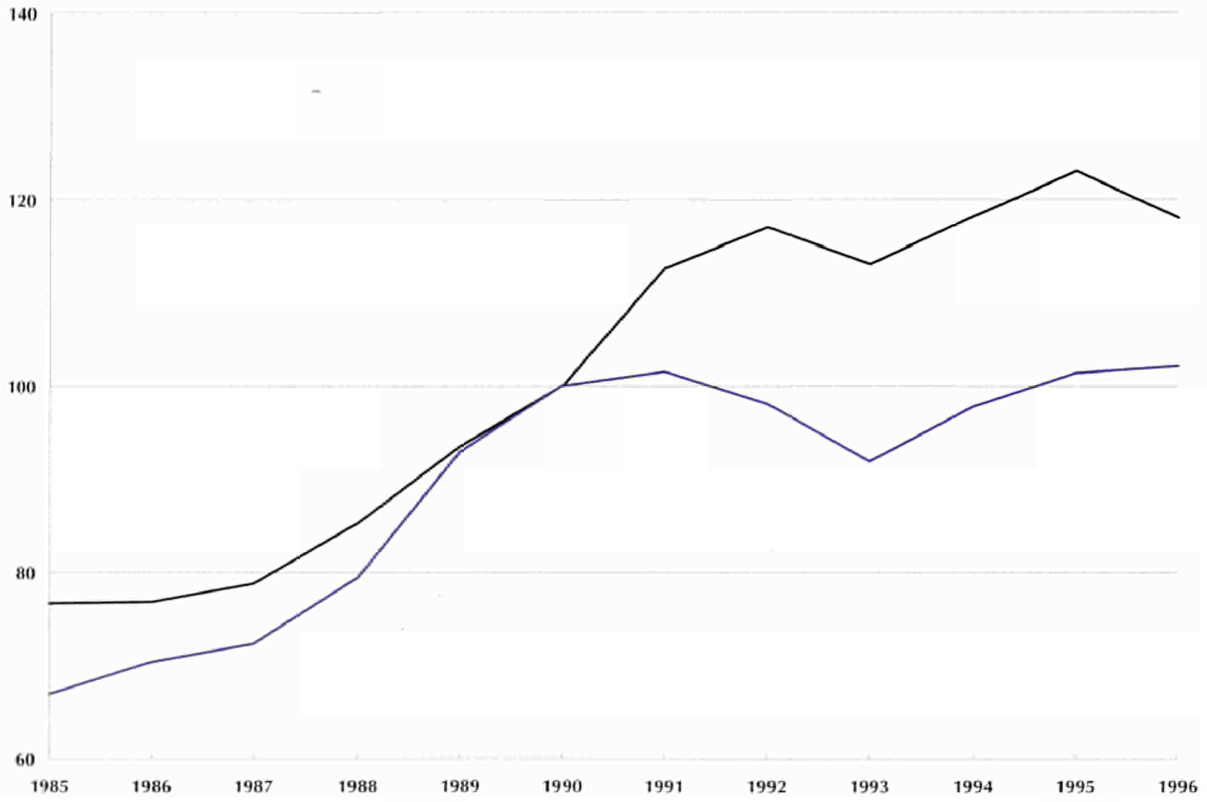
Taps and valves to a value of ECU 13.5 billion were produced in 1994 in the EU, Compared to 1985, this represents a nominal growth of 54%, which means that the branch performed much better than mechanical engineering as a whole. The main reason for this positive trend was the boom in demand in eastern Germany, which gave EU manufacturers of taps and valves a strong boost in 1991 and 1992 and prevented an even sharper fall in 1993.

The strong domestic demand in the EU temporarily reduced sales efforts on foreign markets, but in 1994 the export share of 23% was again more or less the same as in 1985. Nevertheless, this leaves the branch far below the average share for mechanical engineering as a whole. This low orientation towards exports does not, however, reflect a lack of international competitiveness, but is typical of this component supply branch. This is confirmed by a look at the import share, which is also exceptionally low, at 9%.

The EU heads the list of the world's largest manufacturers of taps and valves by a long way. In 1994 it had a share of 47%, while the USA had 21% and Japan 18%. It should also be pointed out that the EU share had even frequently exceeded 50% in the years before. In the individual regional markets the position of the EU firms varies considerably.

Figure 3.4

Evolution of production index (1990=100)



Source: VDMA

Whereas they dominate the market, with shares of over 80%, in Eastern Europe, Africa, the Middle East and Central Asia, the Japanese are far ahead in the Far East and the Americans in Latin America.

European manufacturers are in an excellent position internationally not only for special taps and valves for industry, but above for high-quality sanitary taps and valves. This is in spite of these being standard products for a high-volume market. The favourable competitive position is based on a clear technological lead which is reflected in the patent statistics: almost half the relevant patents in this branch come from the EU.

The transmission equipment branch (29.14) comprises roller bearings and products for mechanical transmission. However, the latter are included in this branch only if the gears, transmissions, clutches, etc., are not incorporated in vehicles. Otherwise they are covered by Division 34 of NACE Rev.1. This branch is a typical component supply industry whose customers are to be found above all in mechanical and electrical engineering and - in the case of roller bearings - vehicle manufacturing. Most output consists of serial products - and in some cases even mass production. This is why the short-term variations in demand in this branch are compounded by a storage cycle. This means that undertakings in this branch are regularly faced with more serious drops in demand than the rest of the mechanical engineering sector.

The transmission equipment branch in the EU comprises a few large undertakings with a world-wide production activity and a large number of small and medium-sized specialists. Their customers are constantly demanding more powerful, more environmentally-friendly, quieter and more energy-efficient transmissions. Longevity and low-maintenance

Figure 3.5

Evolution of production index (1990=100)

Source: VDMA

operation also play a role. For this reason, research and development play a key part in all undertakings. Also typical of this branch are the close supply relationships with domestic industry.

Transmission equipment had a production value of ECU 12 billion in the EU in 1994. Compared with 1985, this represents a nominal increase of 23%, which is only half the rate for mechanical engineering as a whole. This overall result, however, conceals strong cyclical variations. After an increase of 39% between 1985 and 1990 there was a sharp drop of 20% in the following three years. In 1994 demand rose again and produced growth of 9%. These fluctuations illustrate one of the main problems of this branch.

The international division of labour in the transmission equipment branch during the reference period has clearly increased. At the end of the period, the export share of the EU was 45% and the import share 15%. Up till 1993, the EU was the world's largest supplier of transmission equipment. The Japanese manufacturers then assumed the lead, taking advantage of their strong presence in the growth market in the Far East. The USA more or less succeeded in maintaining its share over the years, but it was always in third place. In 1994 Japan had a 38% share of supplies, the EU had 34% and the USA 17%.

The loss of the lead in world trade is due to a decline in the field of roller bearing, where the market is dominated by global players. In this field, the Japanese manufacturers of small and medium bearings have been successful in converting to a price strategy aimed at high-volume markets. In the other segments of the transmission equipment branch, competition is not so world-wide, and local customer relationships also play a major role. The position of the EU manufacturers in terms of technology is clearly not so bad, since they have registered some 40% of the relevant patents, compared with Japan at just under 30% and the USA at just under 25%.

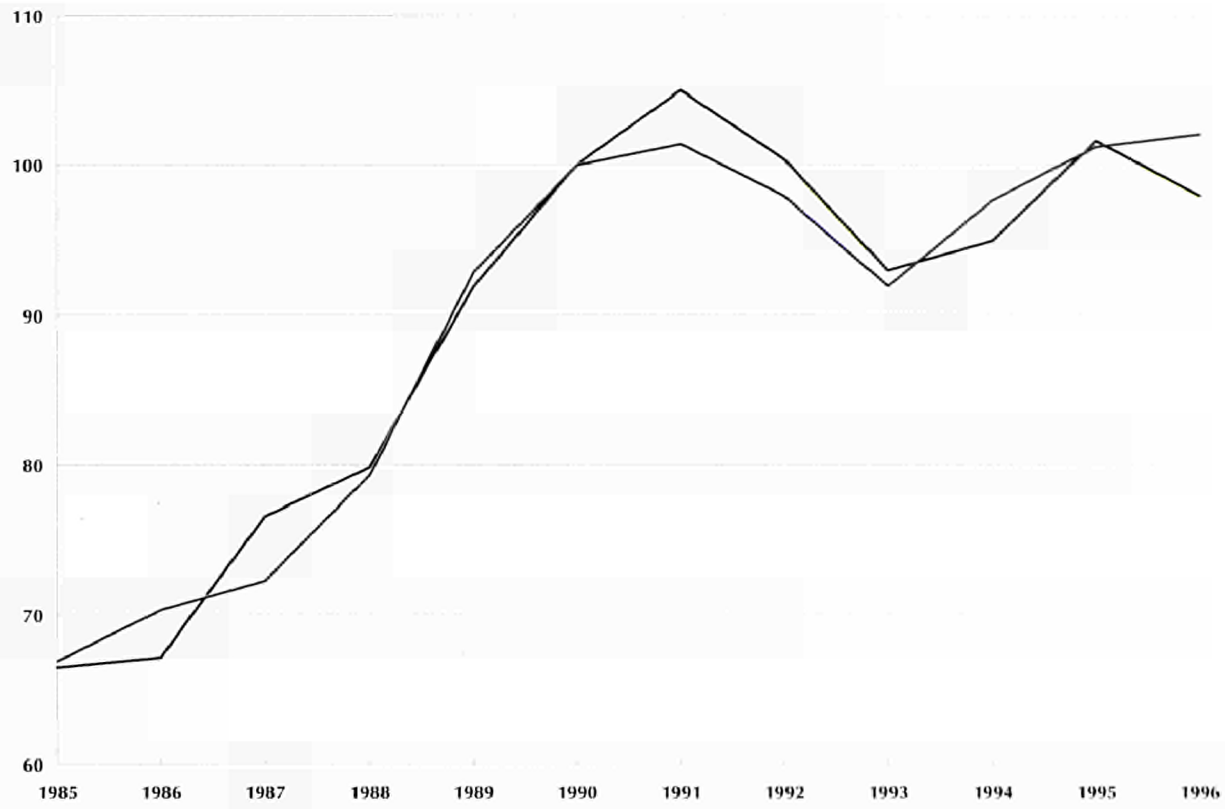
The firms within the branch (29.21) produce furnaces and furnace burners, comprising electrical and other industrial and laboratory furnaces and ovens, incinerators, the manufacture of burners, stokers, grates and ash dischargers. As furnaces are often fully integrated into the production process, producers are often involved from the conception stage of supplying equipment. This class of activity is characterised by a large number of SME's, but there remain a number of firms of significant size. Innovation efforts are concentrated above all on reducing energy consumption and fighting against pollution is another major preoccupation. The use of specific technical measures and process control techniques also create opportunities to optimise some production processes. Enterprises making furnaces are usually involved in replying to specific needs of the client, they therefore usually work in terms of producing a specific product. Furnace burners, on the other hand, are generally standardised products which result from mass production.

In 1994, EU production for this particular activity reached 3.2 billion ECU, a nominal rise of 43% compared to 1985. This activity was adversely affected by the recession of 1992-93: indeed, the evolution of output follows closely that of the whole industry. Particularly badly hit were internal Community markets, however enterprises were able to compensate in part for the weakness of the European market by increasing their exports to third countries. The export rate moved from 39% in 1985 to 45% in 1994. During the same period the import penetration ratio fell from 17% to 15%.

This shows that European producers of furnaces and furnace burners have faced up to international competition well. The good results obtained by EU producers are especially noticeable in export performance, where EU firms account for 58% of world trade (amongst the group of main trading countries). The EU performance is well ahead of that of the USA (20%) and Japan (12%). Furthermore, EU enterprises are out-performing American and Japanese competitors in the Far East and in Latin America, traditionally strong markets for these

Figure 3.6

Evolution of production index (1990=100)

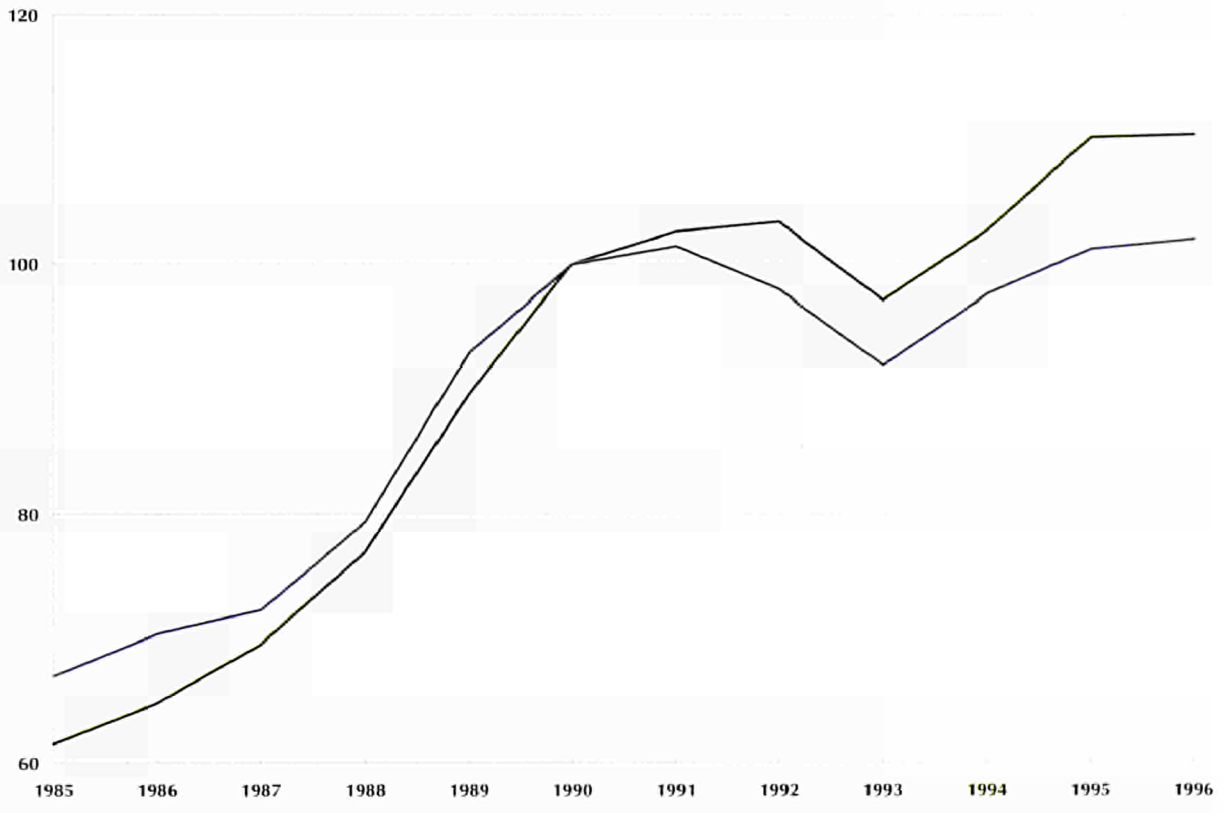


NACE 29.21 ——
NACE 29.1-5 ——

Source : VDMA

Figure 3.7

Evolution of production index (1990=100)



NACE 29.22 ——
NACE 29.1-5 ——

Source : VDMA

two countries. During the period of analysis of this study, the EU even improved its position as world leader in this particular industrial activity.

The lifting and handling equipment branch (29.22) produces cranes, standard lifting equipment, lifts, escalators and moving walkways. The many enterprises active in this branch in the EU are mostly specialised in individual market segments. Most of them are small and medium-sized firms, but there are also a number of multinational concerns. The international fork-lift truck market, for example, is occupied exclusively by large enterprises, and a small number of large firms are also dominant in the lift and escalator market. Much lifting and handling equipment is produced as special machinery to customer specifications by combining standardised components according to the building-block principle. At the final stage, however, mass-production methods are also used, e.g. in the case of fork-lift trucks. Product innovations draw on microelectronics, sensor technology and computer technology.

In 1994 the production of this branch was worth approximately ECU 23 billion, thus making it the largest mechanical engineering branch. Compared with 1985, this represented a nominal increase of 67%, which was far higher than the increase in mechanical engineering as a whole. This was partly because the branch was not badly affected by the 1993 recession. The positive trend reflects the fact that lifting and handling equipment play a decisive role in rationalising production processes, in-house transport and storage. Firms still pressed ahead with rationalisation measures.

The proximity of the customer is important in the sale of lifting and handling equipment, which explains why the participation of this branch in international trade is relatively low. This can be seen in the EU by the 23% export ratio and the 8% import ratio. However, this does not prevent EU manufacturers, with 36% of deliveries, from being in the lead in international trade. They are followed by Japan with 26% and the USA with 22%, although it cannot be ignored that the EU has lost out since the beginning of the 1990s because of its relatively weak presence on the growth markets in the Far East.

The number of patents granted world-wide indicates that European manufacturers are in a strong position, since they account for approximately half the relevant patents, while competitors in the USA account for approximately 20% and those in Japan 18%. Although engineering and the ability to solve individual customers' problems may be regarded as the special forte of the Europeans, they have also performed well to date in purely high-volume markets.

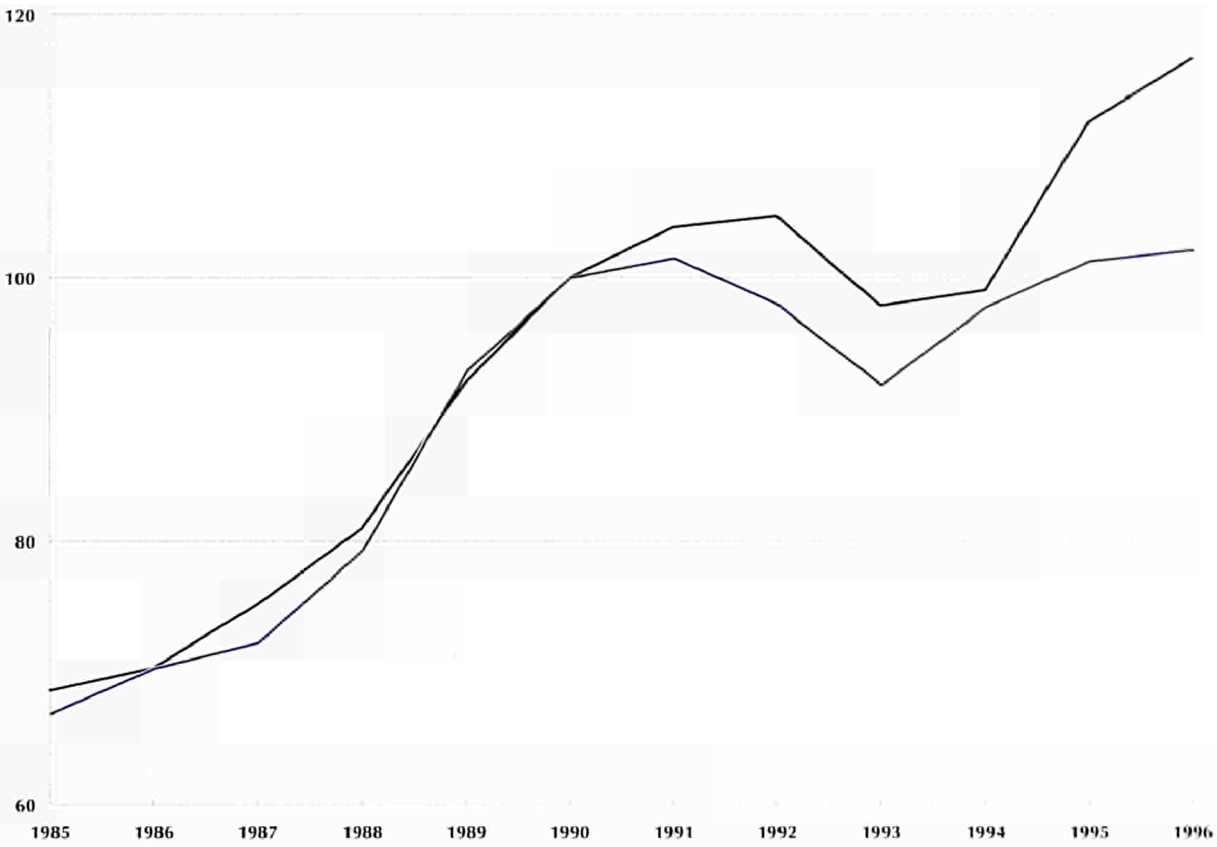
The manufacture of non-domestic and cooling and ventilation equipment (29.23) covers mainly fans, air-conditioning machines, heat exchangers, dust extractors and refrigeration equipment. The products range from components for assembly to complete systems, so that manufacturing involves individual, small and mass production at the same time. Pressure to improve the safety and efficiency of equipment and to improve environmental protection are what gives the branch incentives to innovate. Small and medium-sized firms are also predominant in this branch. There are large firms in the refrigeration engineering segment, but their production range mostly goes far beyond the scope of this NACE heading.

In 1994 this branch manufactured products worth ECU 14.7 billion in the EU. This was a nominal increase of 44% over 1985, roughly in line with the average for mechanical engineering as a whole. The trend was much steadier, however, than in the sector as a whole, and the branch suffered relatively little from the recession since it was able to profit from the need for modernisation in eastern Germany. In addition to this, there were further stimulants in the form of statutory environmental requirements, e.g. on the desulphurisation of flue gases.

While exports during the reference period moved in line with production, with the EU export ratio

Figure 3.8

Evolution of production index (1990=100)

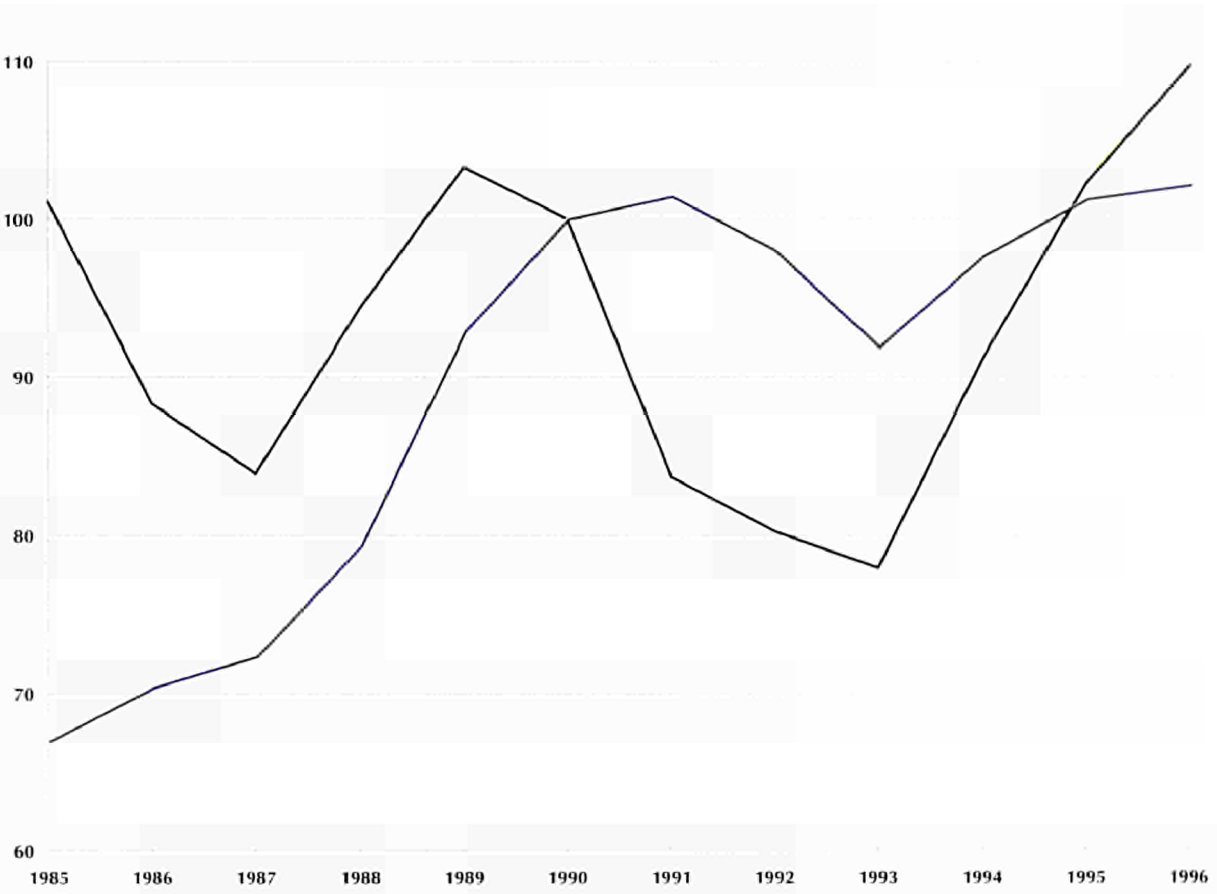


NACE 29.23 ——
NACE 29.1-5 ——

Source: VDMA

Figure 3.9

Evolution of production index (1990=100)



NACE 29.31 ——
NACE 29.1-5 ——

Source: VDMA

fluctuating between 18 and 20%, imports increased far more than market supply. As a result, the import ratio rose from 9 to 14%. Much of this success was achieved by Japanese manufacturers, who have increased their deliveries to the EU sevenfold in ten years and now account for about half of EU imports.

In 1994 this branch was well behind in world trade, occupying third place with 23% of deliveries. Ahead of the field, Japan with 33% and the USA with 31% were neck-and-neck. EU manufacturers lost out considerably over the reference period, not least because they are fairly poorly represented on the high-growth markets.

The agricultural tractors branch (29.31) covers the manufacture of walking (pedestrian controlled) tractors, agricultural and forestry tractors and other traction units used in agriculture. They are generally mass-produced, which gives an advantage to the large enterprises which dominate this branch. Tractor manufacturers have scope for innovation in the increased use of information and communication technology. In the EU these products are also manufactured by branches of the major American producers, who are present in all EU statistics. It is obvious that these production sites also have a considerable influence on external trade flows.

In 1994 the production of agricultural tractors in the EU in value terms was approximately ECU 6 billion. Compared with 1985, this is a nominal decrease of 10%, but in real terms the loss is likely to be two to three times higher. Demand for tractors was also curbed by the trend towards larger holdings and the increased performance of new generations of machinery. The need for replacement which had built up did, in fact, lead to greater demand in 1995 and 1996.

Compared with world production, world trade in tractors is relatively insignificant, since the major producers often manufacture on the spot and also many developing countries already have tractor-manufacturing capacities which largely cover their own requirements. Of the major exporting countries, the EU had a 51% share in deliveries of agricultural tractors in 1994, well ahead of the USA with 21% and Japan with 19%. In view of the above-mentioned restrictions, however, these figures are hardly a basis for assessing the competitiveness of EU manufacturers.

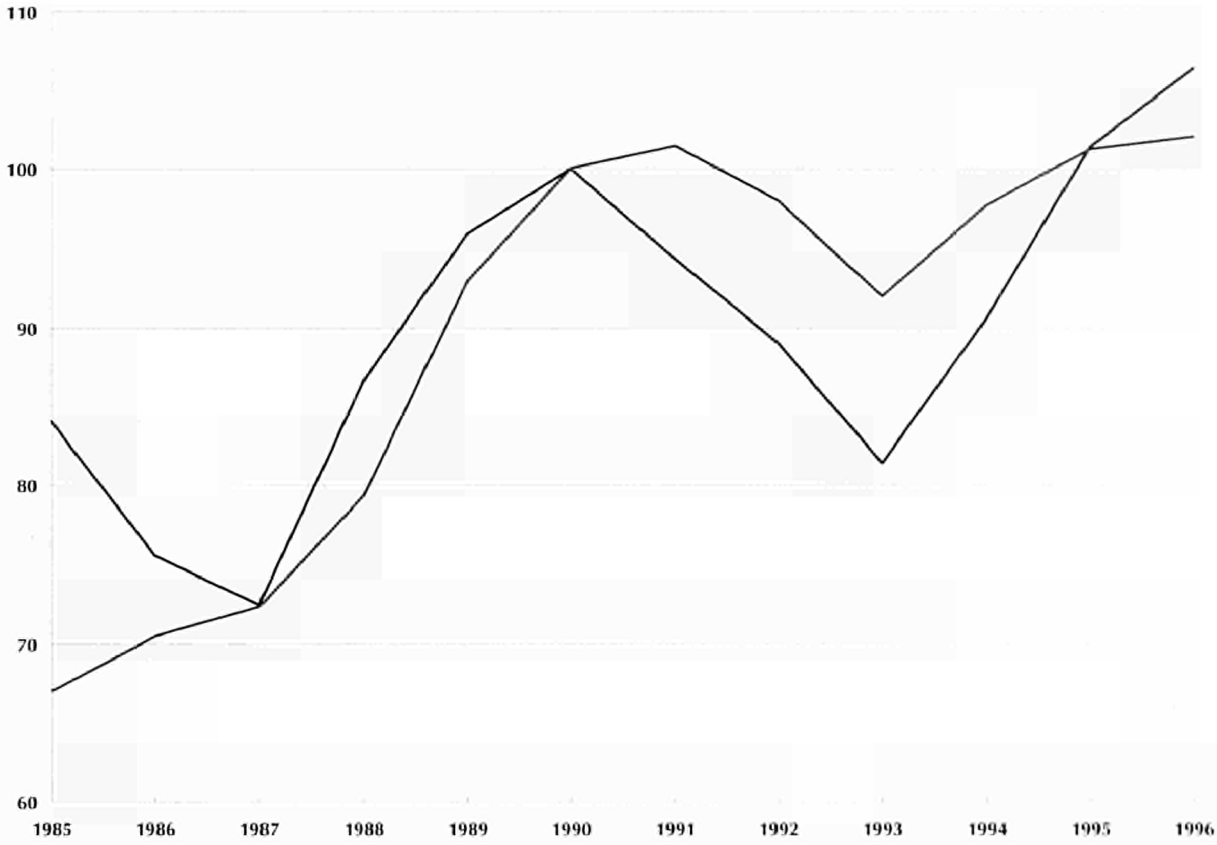
The manufacture of other agricultural and forestry machinery (29.32) covers machinery and equipment for soil preparation, planting, harvesting, fertilising, milking and livestock farming. This wide product range provides scope for many small and medium-sized firms. Larger producers are involved only in the manufacture of self-propelled harvesting machinery. Innovations are geared mainly to achieving increased efficiency, operational safety or soil protection. As in the case of agricultural tractors, the use of information and communication technology offers this branch the chance of achieving integrated farming systems.

The value of this type of agricultural machinery produced in the EU in 1994 was almost ECU 9 billion. Although this was 8% more in value terms than in 1985, this increase far from covers the price increase over this period. Although no price indices are available at branch level, this statement is supported by the 44% price increase for the mechanical engineering sector as a whole over the same period. The reasons for the decline in real terms are the same as for the fall in the production of agricultural tractors.

There is little international trade in this branch, so that in 1994 the EU export ratio was only 18% and its import ratio 11%. It should be noted in this connection, however, that the import ratio more than doubled over the reference period. In world trade the USA, with 43% of deliveries at the last count, is ahead of the EU with 38%. In 1995 this order was reversed. American manufacturers have managed to increase their share considerably since 1985, but this was at the expense of not only of the EU but also of Canada and Japan.

Figure 3.10

Evolution of production index (1990=100)

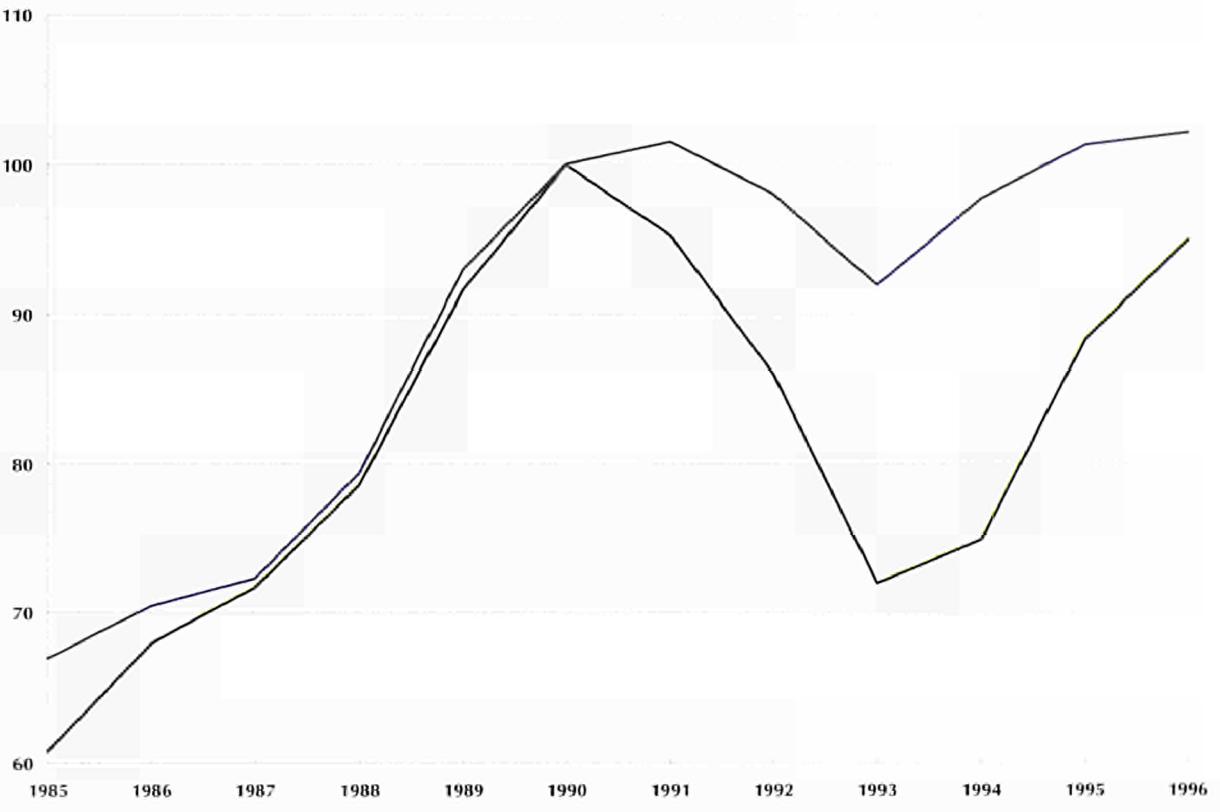


NACE 29.32 ——
NACE 29.1-5 ——

Source: VDMA

Figure 3.11

Evolution of production index (1990=100)



NACE 29.40 ——
NACE 29.1-5 ——

Source: VDMA

EVOLUTION BY ACTIVITY

EU manufacturers have a clear technological lead in the agricultural machinery branch. However, their share of over 50% of relevant patents granted world-wide gives a somewhat exaggerated view of this position, since a proportion of the patent applications merely cater for traditional special features in the agriculture of the individual Member States.

The NACE machine-tools branch (29.40) includes not only, as often supposed, machine-tools for metalworking but also woodworking machines, machines for working stone and other hard materials, welding machines and hand tools with self-contained motor. This wide-ranging selection includes many special solutions adapted to customers' specific requirements, but also many standard products. Product innovation is geared mainly to increased automation but also to the more efficient use of raw materials and the reduction of energy costs. In the EU it is almost exclusively small and medium-sized enterprises which are engaged in this branch.

Between 1985 and 1994 production in this branch increased in nominal terms by 23% to ECU 16.4 billion. This is only half the average increase in value terms in the mechanical engineering sector as a whole and in real terms it represents a marked decline. Since the normal cyclical reaction was compounded by the ending of the Cold War, which all over the world dealt a sudden blow to the demand from the armaments industry for high-quality machine-tools for metalworking. Thus, after the record performance of 1990, when EU production reached ECU 22 billion, production plummeted in the following three years. Then, in 1994, there was an upturn, which continued in 1995 and 1996, although the branch still has a long way to go before regaining its previous level.

Low domestic demand forced EU manufacturers to turn increasingly to exports at the beginning of the 1990s, and this can be seen from the marked increase in the export ratio from 28% to 41%. At the same time, however, the import ratio rose from 22% to 25%. These ratios demonstrate that the international division of labour in this branch is higher than average. In 1994, the EU accounted for 38% of exports from the main exporting countries, thus retaining its lead over Japan with 26%, the USA with 16%, Switzerland with 10% and Taiwan with 7%. However, this cannot hide the fact that the EU has lost part of its lead over the past ten years, mainly to the USA and Taiwan. EU manufacturers continue to occupy a strong position on the special machinery market, where they can capitalise on their technological lead, which is also underpinned by patent statistics.

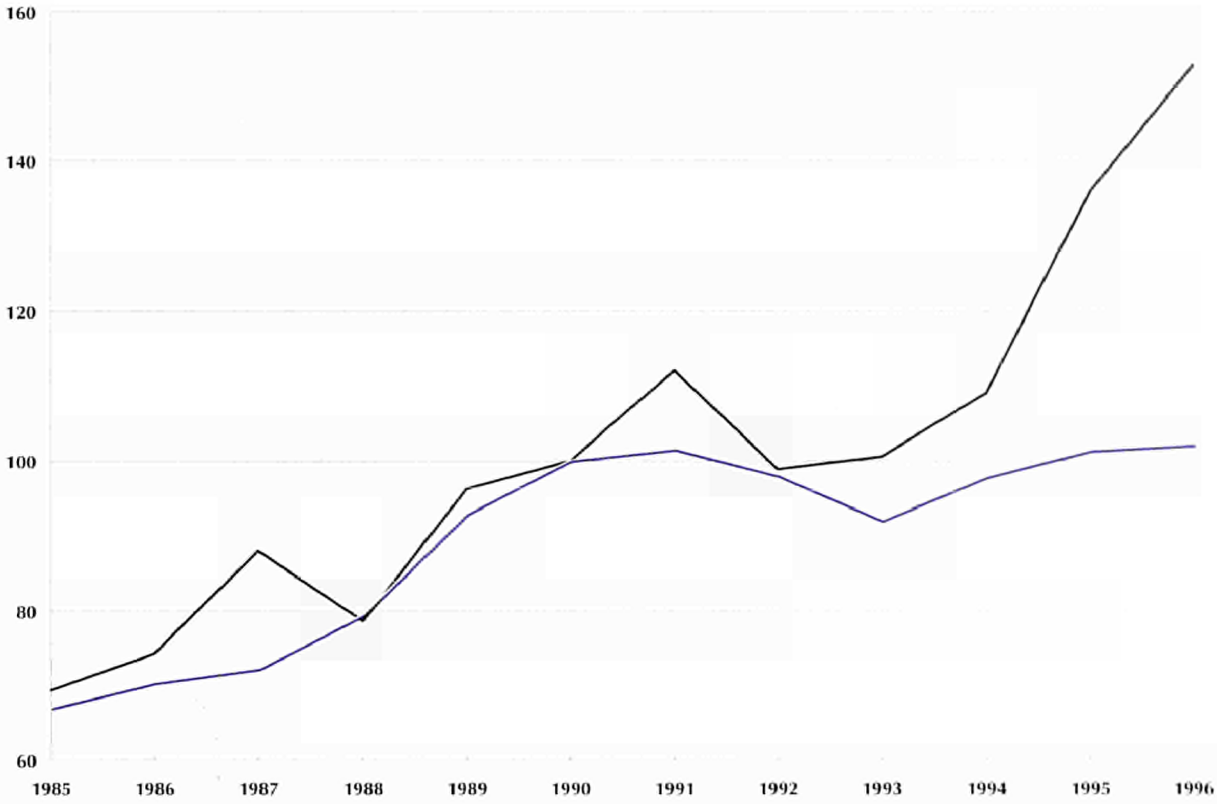
The machinery for metallurgy branch (29.51) produces machinery for metal production, metal-rolling equipment and casting machinery. Only a small proportion of the products are suitable for mass-production, so that one-off production predominates, and the construction of complete turnkey smelting works and rolling mills is a major aspect of production. Since firms must be of a certain size to construct this type of plant, there are also a number of large enterprises in this branch. The main scope for innovation is the improvement of the processes carried out with the machinery and plant produced by this branch.

In 1994 the value of machinery for metallurgy produced in the EU was ECU 3 billion, an increase of 57% in nominal terms compared with 1985 and considerably more than the average for mechanical engineering as a whole. There is therefore considerable growth in this branch, with exports providing the stimulus. The main markets were the Far East, the USA and Latin America. The major importance of exports to non-Community countries can be seen from the EU export ratio of just under 50%. In contrast, imports, with a ratio of just under 8%, do not play a major role.

In 1994 the EU accounted for 47% of the machinery for metallurgy exported by the main exporting countries. It was well ahead of Japan with 21% and the USA with 14%. Europe's lead is underpinned by patents, with EU manufacturers accounting for 45% of all relevant applications in this area, com-

Figure 3.12

Evolution of production index (1990=100)



Source: VDMA

pared with 25% for Japan and 20% for the USA. All the other statistical benchmarks for measuring international competitiveness also indicate that the EU occupies an excellent position in this branch.

In the mining, quarrying and construction machinery branch (29.52), construction machinery - comprising excavators, loaders, road rollers, bulldozers, concrete mixers and concrete handling equipment - represents the biggest product group. Associated building-materials production facilities include cement, limestone and gypsum mills as well as plant and machinery for the manufacture of glass and ceramics, while mining machinery encompasses tunnelling and deep-hole drilling equipment, extracting machinery and continuous conveyors for underground workings. Most items of construction machinery are series-manufactured standard products. In the case of building-materials production machinery, on the other hand, special-purpose units predominate, with the design and construction of complete facilities also playing an important role. Mining machinery is usually produced in low-volume series. Product innovation in this area is targeted at vibrosilencing and enhanced operator safety. Electronic control technology opens up additional scope.

In 1994, the branch achieved an output value in the EU exceeding 17 billion ecus, making it the second largest mechanical engineering branch after lifting and handling equipment (29.22). The period 1985 to 1994 saw a nominal production increase of only 24%, with cyclical fluctuations exhibiting the same pattern as throughout the mechanical engineering industry. In the period 1991 to 1993, the vigorous construction boom in eastern Germany meant that this division was spared an even more severe setback.

In the late 1980s, buoyant sales in the Community had lulled many manufacturers into neglecting exports to third countries. As a result, the export ratio fell from 43% to 30%. From 1993 onwards, however, industry stepped up its sales efforts in the Far East, Eastern Europe and the USA, taking the export ratio back up to 43% in 1994. The import ratio latterly stood at 13% and was thus slightly down on the level for mechanical engineering as a whole.

EVOLUTION BY ACTIVITY

The EU was this branch's biggest exporter world-wide in 1994, accounting for 41% of exports by the most important supplier countries. The second biggest exporter was the USA, accounting for 32%, ahead of Japan with 20%. The EU and the USA leap-frogged each other several times during the period under review, inevitably conveying the impression that the export leader is always the one whose domestic construction industry is the cyclical laggard.

Technologically, EU manufacturers lead the field world-wide. In recent years, they have filed almost 55% of all major patents in this area, while the USA has notched up 20% and Japan just on 15%. The Europeans are clear market leaders both in the building-materials machinery segment, where their superior engineering stands them in good stead, and in the area of specialised giant excavators for open-cast mining operations. They have more difficulty asserting their position on the high-volume markets for construction machinery, which are dominated by major international groups.

The broad product spectrum of the food, beverage and tobacco processing machinery branch (29.53) encompasses, for example, machinery and equipment for dairies, mills, bakeries, beverage production, meat processing, sugar and confectionery manufacturing as well as for industrial kitchens and the cigarette industry[5]. As regards production set-ups, the low-volume and one-off manufacture of specialised machinery holds sway. The wide-ranging product portfolio is matched by a high degree of specialisation on the producer side, hence the predominance of small and medium-sized enterprises in this division. Larger-size manufacturers have become established only in the production of beverage-filling and cigarette-manufacturing machinery.

While the absolute output values for the branch are too high, owing to the inclusion of packaging machinery, they probably provide an accurate picture of development trends. Between 1985 and 1994, the branch achieved a nominal production increase of 78%, thus enjoying above-average expansion. The strong upward trend was only slightly dented by cyclical fluctuations in the period under review. Even the 1993 recession brought only a slight fall in output. Internal-market sales and non-EU trade are twin mainstays of this trend, and showed well-nigh identical expansion. Within the EU, German unification gave a particular boost to demand as the food-processing industry geared itself up for the eastern German market. World-wide, advancing industrialisation and growing prosperity in the newly industrialised countries lent additional impetus.

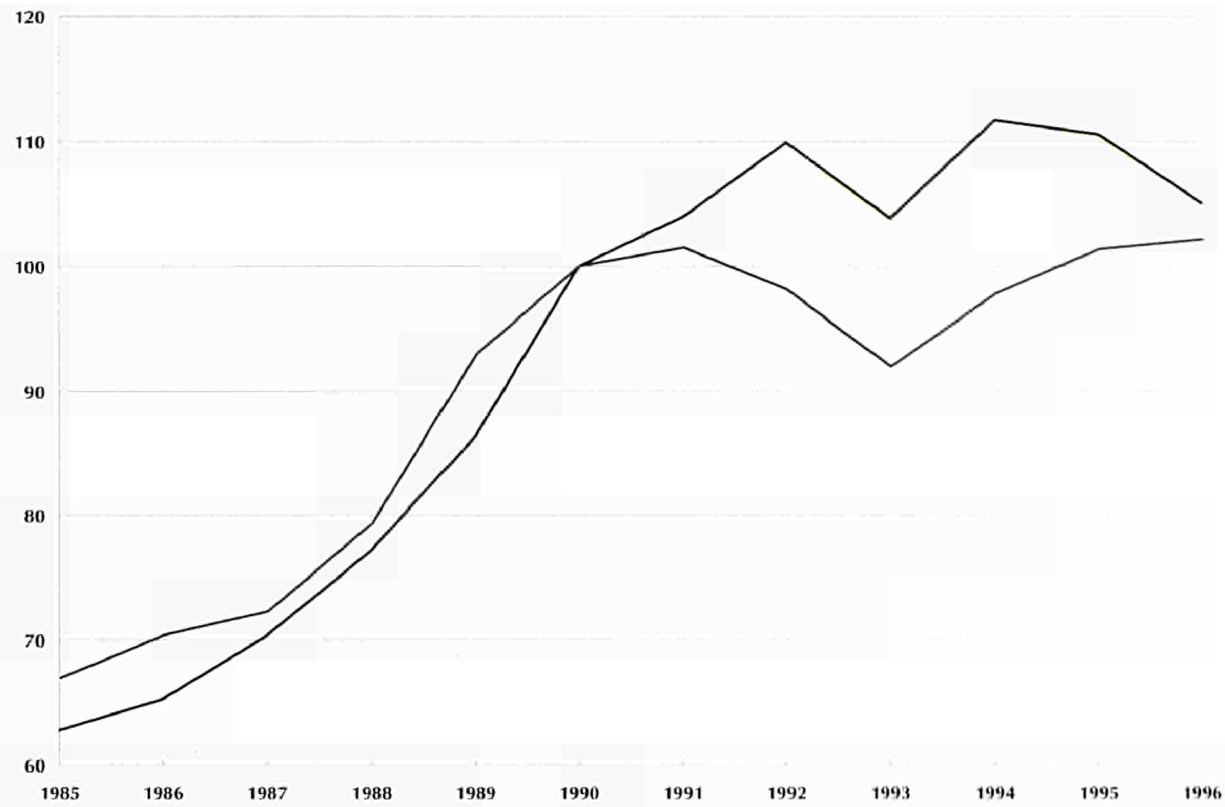
The EU clearly dominates the world market for food-processing machinery, with the Community accounting for around 64% of the major supplier countries' exports in 1994. The USA came a distant second at 16%, followed by Switzerland and Japan, accounting for 8% and 7% respectively. Given this dominance, it is hardly surprising that EU manufacturers are in front even in the Far East and America. They have attained this outstanding competitive position by virtue of a technological edge that is also reflected in patent statistics: a good half of all major patents in this area are held by EU companies. They are followed by US competitors, with a share of around a quarter, and by the Japanese, who account for a good 10%.

The most important product groups in the textile, apparel and leather production machinery branch (29.54) are spinning machines, weaving machines, knitting machines, textile finishing machines, (automatic) sewing machines, laundry and dry-cleaning machinery as well as leather-processing and shoe-manufacturing machines. Innovative developments in this area are geared towards enhancing production logistics, reducing noise and emissions and improving machinery safety.

5) The data for this branch covering the period 1985 to 1994 also include packaging machines, which really fall within Class 29.24 of NACE Rev.1. In the past, these machines were usually recorded in national statistics together with food processing machinery.

Figure 3.13

Evolution of production index (1990=100)

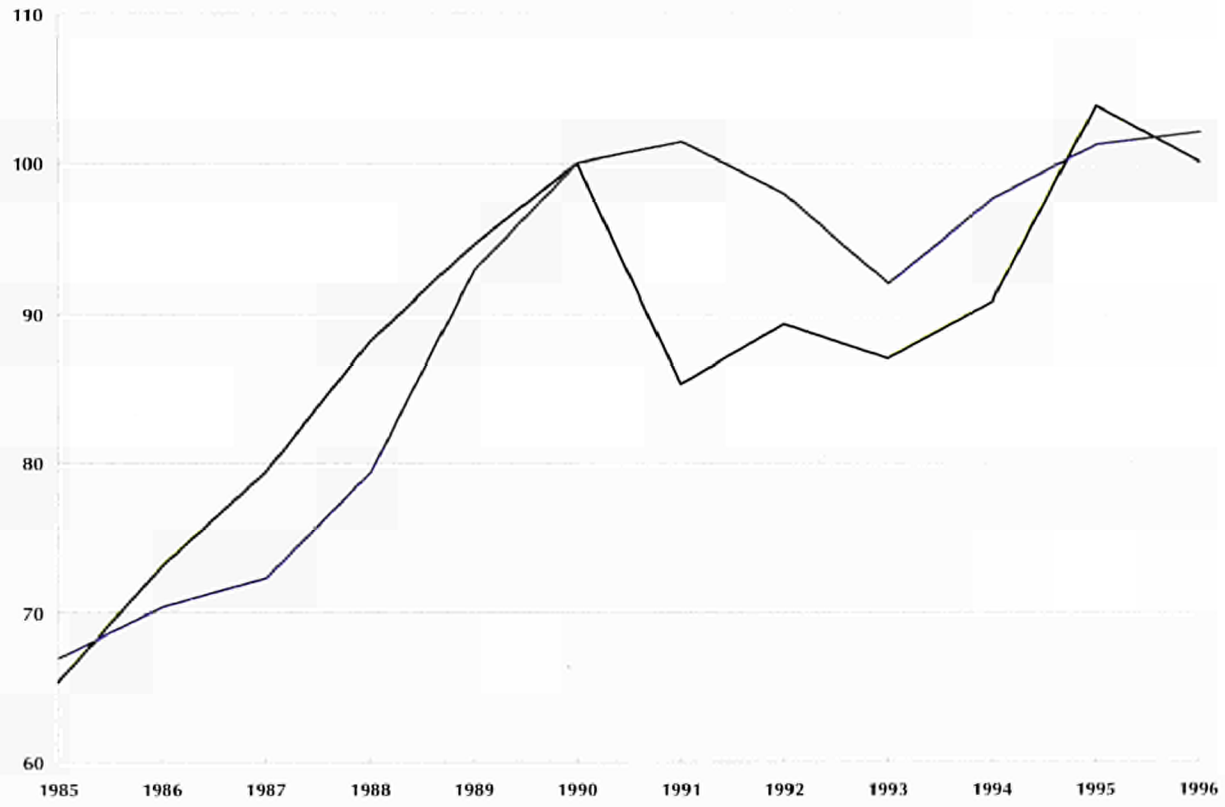


NACE 29.53 ——
NACE 29.1-5 ——

Source : VDMA

Figure 3.14

Evolution of production index (1990=100)



NACE 29.54 ——
NACE 29.1-5 ——

Source : VDMA

EVOLUTION BY ACTIVITY

In 1994, the output value in the EU stood at ECU 10.4 billion, representing a nominal increase of 39% on 1985. The branch thus lagged slightly behind the mechanical engineering industry as a whole. This weak trend was clearly caused by the poor level of demand in the EU, which showed a nominal increase of just 13% in the period under review. Sales to non-EU countries, on the other hand, rose by 65% over the same period, further increasing the EU export ratio from the already extremely high 54% mark of 1985 to 64%. The EU's import ratio, however, is also relatively high, and mainly reflects deliveries from the Swiss textile industry.

The high export dependency of EU manufacturers in this branch means they are largely unaffected by the business cycle in the internal market. This is why they were left more or less unscathed by the events of 1992/93. The downside is that they are more heavily dependent on the economic trends in North America and the Far East, which accounts for their having already suffered an appreciable setback in 1991.

The EU is the biggest exporter in this branch. In 1994, it provided 44% of the major supplier countries' exports and was thus ahead of Japan (26%), Switzerland (10%) and the USA (8%). Over recent years, Taiwan and South Korea have inconspicuously emerged as serious competitors, and this naturally makes itself particularly felt in the Far East - the world's fastest expanding market.

European manufacturers are still the clear technological leaders in this branch, with Germany offering special expertise in spinning applications, Italy in knitting and Switzerland in weaving. In shoemaking and leather-industry machinery, Italian producers lead the field, as is further borne out by the patent statistics. European producers are worried, however, that it could become more and more difficult in future to maintain their lead, as their clients - the textile, clothing and shoe industries - are increasingly relocating to Asia. Not only is it difficult to serve distant markets, but a lack of feedback from strong domestic customers has a detrimental effect on in-house expertise.

The product offering of the paper and paperboard production machinery branch (29.55) covers plant and machinery for the manufacture of paper and paperboard, paper-cutting machinery and machines for the further processing of paper and paperboard. While one-off manufacturing set-ups predominate for paper-production machinery, machines for paper processing are usually produced in low-volume series. Both areas are largely the preserve of small and medium-sized companies. The manufacture of complete facilities for paper production requires higher capacities, and large international concerns have accordingly become established in this segment. The main innovative thrust emanates from improvements to customer's production processes, with solutions to logistical problems featuring prominently in this context. Electronic control technology is opening up new potential, while ever faster production processes make exacting demands on the mechanical quality of plant and machinery.

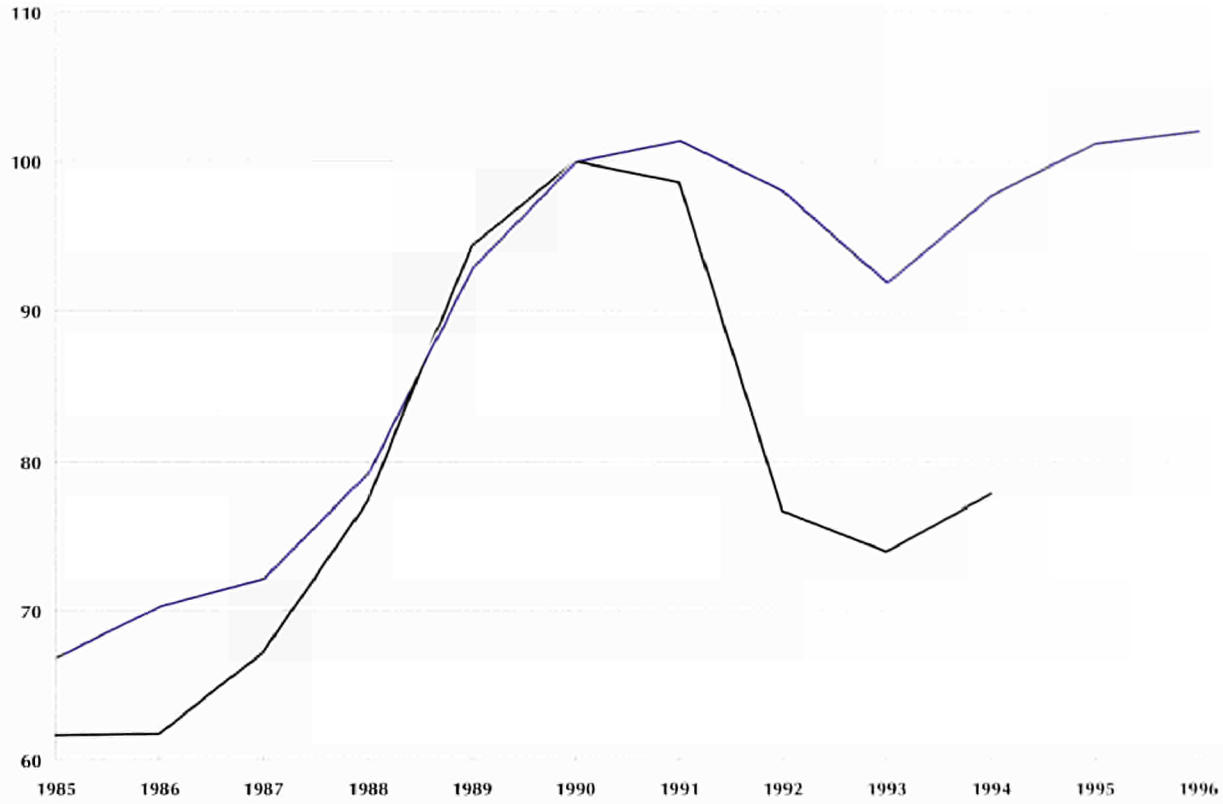
The output value of paper-making machinery in the EU increased by a nominal 26% between 1985 and 1994 to ECU 4.2 billion. This fell well short of the overall mechanical engineering growth rate, and in real terms the initial level was not maintained. Underlying this trend until 1990 was a steep rise in output value to the record figure of ECU 5.5 billion, followed by a severe slump from 1991 to 1993. This roller-coaster ride primarily reflects demand fluctuations in the Community. While similar ups and downs were experienced on the export side, they were not nearly so pronounced.

Thus, the export ratio rose from 41% in 1985 to 51% in 1994. Imports do not play a major role here, as witness a ratio of just 6%.

World trade in paper-making machinery is dominated by EU manufacturers, who in 1994 accounted for 54% of exports by the major supplier countries. The USA and Switzerland came in second

Figure 3.15

Evolution of production index (1990=100)



Source: VDMA

some way behind at 14% each, with Japan bringing up the rear at 9%. This breakdown showed little change during the period under review. The outstanding competitive position of EU producers is underscored by the patent statistics. EU companies in this branch hold 55% of the relevant patents, while US competitors filed just on 25% and the Japanese barely 15%.

The branch for domestic appliances (29.70) includes electric domestic appliances (more than 85% of activity) as well as non-electric domestic appliances. Production of the branch reached 31.4 billion ECU in 1996, up by 1.4% compared to 1995. Employment in 1995 was equal to some 247,000 persons. EUR15 exports in this branch accounted for 14.5% of production (outside of the EU), whilst imports represented 9.1% of consumption. The EU runs a healthy trade surplus in this industry.

Purchases of goods in this sector are largely due to replacing defective items within the household. This is particularly true for so-called "white products" - such as refrigerators and washing-machines. Nevertheless, there have been consumer campaigns justifying the benefits of other items (for example, dishwashers) with the result that their penetration rate into European households has risen markedly in recent years. Furthermore, new design concepts have evolved for product lines that have existed for decades (such as the introduction of coloured appliances - toasters and refrigerators). Finally, important measures have been taken with the aim of saving energy and reducing damage to the ozone layer.

Summary

The 1992/93 recession adversely affected most branches of the EU mechanical engineering sector, and even in 1996 some of them had still not yet recovered the lost ground. A good sales position on non-EU markets had a positive effect across the board, providing a cushion against cyclical demand swings on the internal market. In most branches, EU producers have a good competitive capability on the world market. One drawback, however, is that demand for machinery has expanded most rapidly on the domestic markets of their chief competitors, the USA and Japan, which has naturally worked to the advantage of the latter.

In virtually all branches, the competitiveness of EU manufacturers is based on outstanding technology which is being turned to particularly good account in the areas of specialised machinery and the design and construction of industrial plant. On the standard-machinery front, on the other hand, EU companies have often come under pressure as a result of customers taking a more price-oriented approach. This has eroded the market shares of producers from European hard-currency countries in particular.

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Fax: (352) 4301 3 4359

The files on the diskette are broken down by industrial branches. Each file contains all countries and indicators for a particlar industry. The files have the following format: country, indicator, branch, periodicity, datatype, data e.g. EF,PROD,B0020,M,S,85.14164...

Step by step guide to using the data on the diskette:

1. Copy the file MPEI.EXE from the diskette to a directory on your hard disk (usually C:\....).
2. If in WINDOWS, switch to the File Manager and double-click on the file. The files will self-extract themselves (into the directory from which the program is run). You may need to perform WINDOW - REFRESH to see the files once the procedure has finished.
3. If in DOS move to the directory you placed the file in (for example, C:\DATA>) and then type the name of the file (MPEI.EXE) and press <ENTER>, the files will self-extract and be placed in the same directory as the EXE.
4. The files are simple, plain text files, with the .TXT extension. The files are comma separated and use speech marks as a delimiter.
5. It should be easy to import/open the data-files into any standard spreadsheet or database package.
6. There is a file for each branch available at the NACE 2-digit level, codes are given in the readme.txt file supplied on the diskette.

Branches:

B0020 Total Industry Excluding Construction
B0040 Intermediate Goods Industry
B0050 Capital Goods Industry
B0060 Durable Consumser Goods Industry
B0070 Non-Durable Consumser Goods Industry
B1000 Mining of Coal and Lignite; Extraction of Peat
B1100 Extraction of Crude Petroleum and Natural Gas; Service Activities Incidental to oil and Gas Extraction, excluding Surveying
B1200 Mining of Uranium and Thorium Ores
B1500 Food and Drink Industry
B1600 Tobacco
B1700 Manufacture of Textiles
B1800 Clothing Industry
B1900 Leather and Shoe Industry
B2000 Manufacture of Wood and Products of Wood
B2100 Paper Industry
B2200 Publishing, Printing, Reproduction of Recorded Media
B2300 Manufacture of Coke, Refined Petroleum Produts, Nuclear Fuel
B2400 Chemical Industry
B2500 Manufacture of Rubber and Plastic Products
B2600 Manufacture of Other Non-Metallic Mineral Products
B2700 Manufacture of Basic Metals
B2800 Manufacture of Fabricated Metal Products
B2900 Mechanical Engineering
B3000 Manufacture of Office Machinery, Computers
B3100 Manufacture of Electrical Machinery
B3200 Manufacture of Radio, TV and Communication Equipment
B3300 Manufacture of Medical, Precision and Optical Instruments
B3400 Manufacture of Motor Vehicles
B3500 Manufacture of Other Transport Equipment
B3600 Manufacture of Furniture; Manufacturing not elsewhere classified
B4000 Electricity, Gas, Steam and Hot Water Supply
B4500 Construction

5 Methodological notes

Industry classification system

NACE Rev.1,
definitions of main industrial groupings

Statistical sources

sources and methods used for short-term indicators and structural data; notes on series used and calculation methods

Signs and abbreviations

specific to use in this publication

Industry classification system

The economic activities used in this publication are defined in the revised Classification of Economic Activities within the European Communities, NACE Rev.1. This classification was laid down in a Council Regulation in 1990 (OJ L293 24th October 1990). It should be noted that many series before 1990 and a large amount of annual data even between 1990 and now had to be converted from the old classification NACE 1970. This estimation process can reduce the reliability of the data. Main industrial groupings that are used in Section 2 of this publication have the following definitions in terms of NACE Rev.1.

Total industry

C + D + E,

i.e. mining, manufacturing and energy supply

Intermediate goods industries

13.1, 13.2, 14.1-14.5, 15.6, 15.7, 17.1-17.3, 20.1-20.5, 21.1, 21.2, 24.1-24.3, 24.6, 24.7, 25.1, 25.2, 26.1-26.8, 27.1-27.5, 28.4-28.7, 31.2-31.6, 32.1, 34.3, 37.1, 37.2

Capital goods industries

28.1-28.3, 29.1-29.6, 30.0, 31.1, 32.2, 33.1-33.3, 34.1, 34.2, 35.1-35.3

Durable consumer goods industries

29.7, 32.3, 33.4, 33.5, 35.4, 35.5, 36.1-36.3

Non durable consumer goods industries

15.1-15.5, 15.8-16.0, 17.4-17.7, 18.1-18.3, 19.1-19.3, 22.1-22.3, 24.4, 24.5, 36.4-36.6

If Member States dispose of more detailed data series at the 4 digit level of NACE Rev.1, a more elaborate definition at this level of desaggregation is used.

Statistical sources

Most of the data in this publication is harmonised data supplied to Eurostat by the EU Member States. The exceptions are:

1) The capacity utilisation series which come from the business surveys carried out on behalf of the Directorate General for Economic Affairs of the Commission (DG II).
2) The data for the USA and Japan, which are supplied by the OECD.

Data sources are indicated for each statistical table. Every effort has been made to include data for the EUR15 Member States. The indices from 1991 onwards are on a post-unification basis and include East-Germany. However the structural data is still on a pre-unification basis.

Short term indicators

The index of production measures changes in the volume of the gross value added created by industry, the branch indices being aggregated by means of a system of weighting according to gross value added at factor cost. The indices are adjusted to take account of the varying number of working days in the month.

The index of producer prices shows (in national currencies) the changes in the ex-works selling prices of all products sold on the domestic markets of the various countries. The EU indices refer to overall weighted price changes. There are not yet indices for Austria. No seasonal adjustment is carried out on these indices.

For the indices of imports and exports, external trade data of 9000 industrial products were grouped according to the industrial NACE Rev.1 activity to which they belong. This grouping can cause certain inaccuracies in the data, which may reduce the reliability of foreign trade series. The value indices are all in ECU terms. The indices for the EU refer only to extra-Union trade, the indices for Member States reflect also intra-Union trade.

The capacity utilisation series come from quarterly European Union business surveys.

For further details of the methodology employed, please refer to the Eurostat publication "Methodology of Industrial Short-term Indicators" CA-97-96-079-EN-C.

Seasonal adjustment

All series except prices and capacity utilisation are seasonally adjusted with TRAMO / SEATS, a method developed by Professor Maravall and V. Gomez. This adjustment also takes account of one-off fluctuations (so called outliers). For France, Finland, Sweden and the United Kingdom the indices are seasonally adjusted by the national statistical office. In addition, Eurostat calculates the trend cycle, i.e. seasonally adjusted series, where additionally the irregular fluctuations have been excluded (using the program TRAMO / SEATS).

Growth rates

The changes which are given in the tables show two different growth rates. The first being for the latest three months data compared to the previous three months data - here the trend cycle is used. The second growth rate is for the latest three months data compared to the same three months of the previous year - here a series only adjusted for the number of working days is used. Estimates are sometimes made to create a EUR15 total.

Graphs

The line graphs show the trend cycle. The bar graphs show the annual growth of the index, using a working day adjusted series. For Member States where just one month is missing (and not more), this missing value was estimated in order to bring the growth rate for all Member States up to the same date. This estimation is indicated by ** in the graph.

Signs and abbreviations

B / L	Belgo-Luxembourg Economic Union
ECU	European currency unit
TRIAD	EU, Japan and the USA
w.d.adj.	working day adjusted series
Billion	thousand million
*	not available (in graphs)
:	not available (in tables)
**	estimation (in graphs)

data in bold, estimation (in tables)

1990 = 100, reference year

6 Sub-contracting in the aeronautics industry

In this section

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Introduction

This article is taken from the publication "New Industrial sub-contracting in Europe. First results with an updated definition" produced jointly by Eurostat and DG XXIII. It is based exclusively on existing documents, principally analyses and studies made at a Union level or national level.

The article gives a description of the aeronautics branch and elaborates on the importance of the sub-contracting phenomenon and the nature of the industrial structure which characterises this particular industry. It is organised on the basis of two distinct sections:

★the aeronautics market, where the composing features of the market are described together with the evolution of aeronautics market, with particular reference to structural change;

★sub-contracting in the industry, comprising of a general presentation of the types of industrial organisation, its characteristics and the effects of the crisis in sub-contracting.

At the end of the article a brief resumé is presented with the essential facts from this study.

The aeronautics market

The European aeronautics industry ranks third in the world with a turnover of 45 billion ECU in 1995. Its size is half that of the United States, the world's largest producer.

Geographical location in Europe

Within the European Union, the location of the industry is unequally distributed over a small number of countries. It is very much linked to the existence of one or more large manufacturers:

★the aeronautics industry is mainly concentrated in two countries: the United Kingdom and France; these two countries account for 68% of the turnover and 64% of employment of the industry at EUR 12 level;

★the industry is also present in two other countries (Germany and Italy) representing less than 30% of the European total;

★the remainder of the industry is shared among the other countries of the Union (between 6 and 7% of the EU total, depending on the indicator selected).

Types of activities

This industry is traditionally divided into three subgroups:

★the "aircraft and missiles" subgroup also known as "airframes", groups together the enterprises (aircraft manufacturers) which produce aircraft as well as missiles and space rockets. They undertake research, definition and control of the work;

★the "engines" subgroup includes the few enterprises which produce, that is design, develop and construct, aircraft engines;

★the "equipment" subgroup, includes the enterprises whose principal activity is closely linked to aeronautics' programmes, but who do not act as prime contractors.

The first two subgroups are quite well-defined and include, by country, a relatively limited number of enterprises (up to about ten) accounted for under the activity code 353 of NACE Rev.1.

On the other hand, the limits of the third subgroup are more vague, the number of enterprises which it comprises is clearly greater (from tens to several hundreds, according to country) and their areas of activity are more diverse. In terms of activity, these equipment manufacturers may themselves be divided into two broad subgroups:

★those that produce products and materials entirely destined for the aeronautics industry;

★those who are specialists in an area for which aeronautics is but one of the markets.

Finally, it should be noted that, depending on the country, the statistics relating to equipment manufacturers can cover a wider or narrower field (for example, the inclusion or not of weapons systems).

Principal enterprises

The market at the world level is shared between a few enterprises[1]. In all countries, the leading enterprises of the industry generally have both civilian and military activities. It is very rare to find in this industry manufacturers who work exclusively or almost exclusively for one or other domain. They may be better known in one or the other segment of the market, but they are more often involved in several:

★the airliner market - other than commuters (that is, airliners of 10 to 100 seats) - covered by five manufacturers: Boeing, McDonnell Douglas, Illiouchine, Tupolev and Airbus (British Aerospace, Aérospatiale, Casa, Dasa). Excluding the GIE Airbus, each of these enterprises has a share in other segments of the market too.

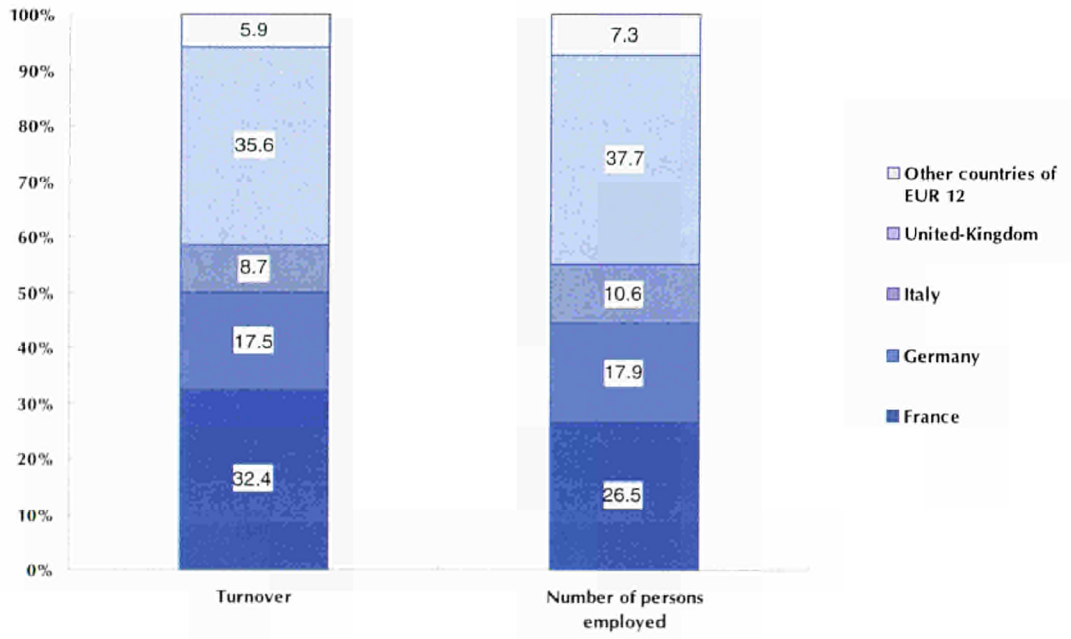


Figure 6.1

Weight of principal countries by turnover and the number of persons employed in EUR 12 in 1993

Source : DEBA GEIE

★in the domain of engines, the market is mainly serviced by four manufacturers: Pratt and Whitney, General Electric, Rolls Royce and Snecma, to which one may add Russian manufacturers (for example, Klimov);
★eight principal producers operate in the helicopter market: Sikorsky, Bell, Boeing-Vertol, recently merged with McDonnell Douglas, Westland, Agusta, Eurocopter. Two Russian manufacturers are also active in this market: Mil and Kamov;
★given the policy of national independence practised by a number of countries, manufacturers of military aircraft are slightly more numerous than civilian aircraft manufacturers (who also operate in the military domain), although their number remains limited. The most important ones are the Americans (Lockheed and General Dynamics - grouped with Martin Marietta in Lockheed Martin - Grumman, Northrop, recently taken over by Boeing which has merged with McDonnell Douglas), French (Dassault) or Russian (Sukhoi); but some smaller manufacturers exist, such as Shorts, a British company that became a subsidiary of the Canadian group Bombardier at the beginning of the last decade.

The weight and importance of traditional airliners should not mask the existence of two other segments of civil aeronautics market: commuters and general aviation, the term referring to light aircraft and business aircraft.

Besides the major players in the sector - AI(R) made up of Aérospatiale, Alenia, British Aerospace and Dassault - there are also enterprises such as Embraer, Saab, Fairchild, Canadair, Cessna, Gulfstream, Beechcraft...

Characteristics of the market

Given the almost undivided domination which the American industry has had in this industry in the past and the global nature of the market, all the prices of products (from aircraft to instruments) are expressed in dollars. The main contractors are therefore sensitive to the evolution of this currency. They aim at the same time to cover themselves against exchange risk and to share this risk with their suppliers, especially when the exchange parities are not directed in their favour.

Note also that the existence of companies of major importance corresponds to the global nature of the market, in Europe this basically applies to Airbus.

Military market

The market for military aircraft responds to other criteria than economic change, and is indeed largely influenced by political decisions. Historically, this is most important market for the industry, as much from the technical point of view (new technologies are often developed for the military before being eventually adapted by civil aviation) as from the economic viewpoint (up to the recent past, two-thirds of the production of the industry was for military use).

Three important facts should be noted:
★from a structural point of view, if military activities remain important, they have, particularly in Europe, a regular tendency to decrease - relatively speaking - compared to civilian activities;
★from the economic point of view, it should be noted that European countries have recorded throughout the 1980s a steady growth in their military spending, although less than that of the United States;
★finally, one should note the recent reversal of this trend, which seems long term, resulting in the lowering of European and North American defence budgets.

Civilian market

In the civilian domain, the aircraft industry is - over relatively long periods of time - traditionally cyclical (cf. figure 6.2). Following the general trend of growth, lie "peaks" - namely in 1964, 1978 and 1988-89 - and years marked by a low level of orders (namely, 1962, 1971, 1974, 1982 and recently 1990-1993) marked by a significant decline in the results of airline companies.

THE AERONAUTICS MARKET - TRENDS OVER TIME

The period from 1978 to date was characteristic of this type of phenomenon. The strong recession which affected developed countries as a whole in the early 1980's led to a reduction in passenger traffic and a net fall in orders of aircraft. The upward trend was brought about by a large increase in orders from 1984 onwards which continued up to the Gulf War. A reduction has since been seen, which has continued until 1995.

The increase in orders during the ascending phase of the last cycle was inflated by the very positive anticipation of a number of companies specialised in leasing. They had forecast a continual growth in aircraft orders by airline companies over the period 1985-2000.

But at the beginning of the nineties, the airline companies were in the red: the financial results of IATA members on international routes stayed negative from 1990 until 1993 whilst the pace of traffic seemed to seriously slow down. In the EU, for example, a drop of 4% in regular passenger traffic occurred in 1991 for the first time since 1940 (source: Panorama 95/96).

Structurally, the demand for civilian aircraft now depends on the development of airline traffic and the need for renewal of the oldest stock of the airline companies.

With their relatively poor financial situation in the early nineties, the airline companies reduced their plans for investment as well as for leasing. Therefore, many orders were halted while a significant proportion of options were cancelled. Aircraft manufacturers were then faced with a huge change in their sales expectations which was totally unexpected.

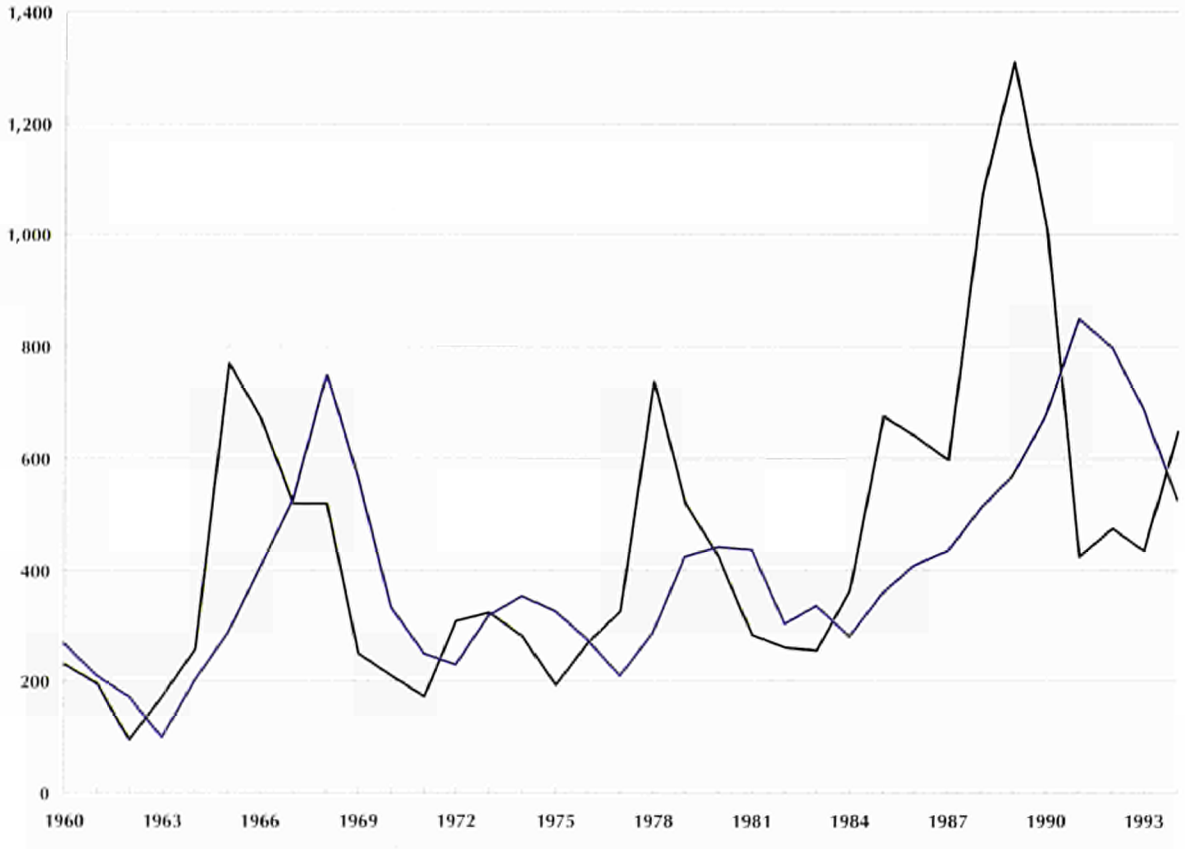


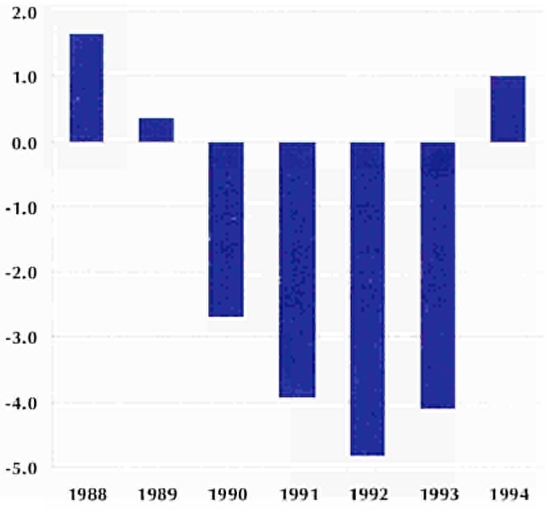
Figure 6.2

Evolution of orders and deliveries of airliners: EUR 12 and USA (units)

Source: The European aerospace industry - EEC - DG III

Figure 6.3

Net result of airline companies on international routes (in billion dollars)



Source : IATA

The evolution of the European aircraft industry

As a result of the development of Airbus industry, Europe has fully benefited from the growth in the demand for civilian aircraft in the ascending phase of the cycle. Combined with increases in defence budgets, there was a positive trend seen in the European Union. From 1980 to 1990, turnover tripled and human resources, after having fallen greatly in 1983 and 1984, regained in 1990 the level of 1982.

After 1990, both the fall in orders from civilian airlines and the reduction in defence budgets in western countries led to a downturn for the EU aircraft industry: its turnover stopped rising and began to decrease slightly from 1993 onwards, while employment diminished due to the deadlines set for deliveries. In 1995 the employment level was about 20% below its level of 1990 (cf. figure 6.5).

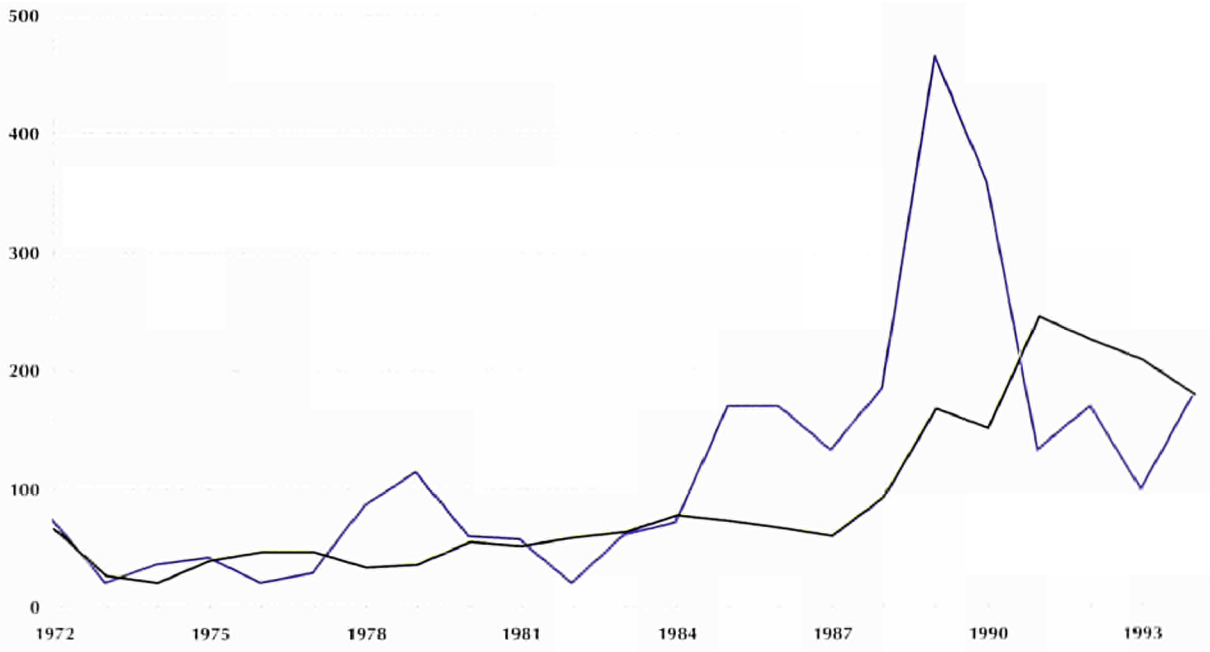
The recession which hit the sector affected virtually simultaneously both civilian and military activities. It was exceptionally strong and long-lasting, marking the beginning of a period of profound changes.

One of these changes related to the emerging demand from Asian airlines. Although a recent phenomenon, their strong development should be noted. They now constitute major clients for aircraft manufacturers. Boeing[2] reported for example that China purchased 16% of the aircraft they sold in 1994. This demand stimulates Asian producers, that now begin to constitute a third production axis, beside the European and the American ones.

Among the various consequences of these phenomenon, two relate particularly to subcontracting: airline companies have undertaken a process of cost reduction and rationalisation which involved

Figure 6.4

Evolution of orders and deliveries of airliners, EUR12 (units)



Commandes
Livraisons

Source : The European aerospace industry - EEC - DG III

SUB-CONTRACTING IN THE INDUSTRY - OVERVIEW

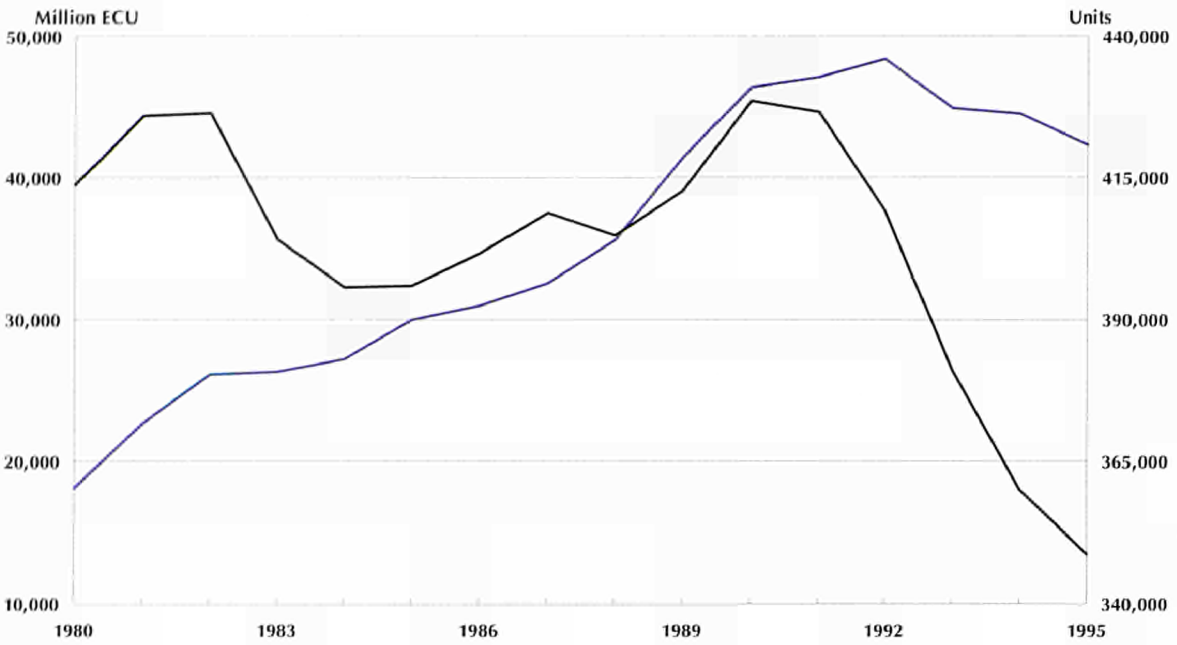


Figure 6.5

Evolution of turnover (left) and the number of persons employed in the aeronautics industry in EUR 12

Source : eurostat

all parts of the system (aircraft manufacturers, engine manufacturers, equipment manufacturers).

The effect of this change on subcontracting was not only to exert pressure on prices and profit margins. It also had - and continues to have - the same impact as occurred in the automobile industry a few years earlier: reduction in time cycle, reduction in the number of direct subcontractors, necessity for an increase in productivity.

Moreover, in aeronautics, a movement to reclaim certain activities by the manufacturer has been observed: activities which had been previously assigned for subcontracting during the period of high growth and for which the manufacturer retained the know-how (subcontracting of capacity).

Subcontracting in the industry

Overview

Like their main contractors, subcontractors in the industry work as much for civil aeronautics as for military aeronautics, even for the arms industry in the broad sense, so it is impossible to distinguish the respective parts of these different sub-groups in their markets. Besides, many aeronautics subcontractors are also suppliers to the automobile industry.

Two forms of subcontracting co-exist in the aeronautics industry: pyramidal subcontracting - linked, as in the automobile industry to the complexity of the product, and transverse subcontracting (by aircraft manufacturers amongst themselves).

The pyramidal type of subcontracting

The pyramidal characteristic, very marked in the aircraft manufacturing industry, enables easy demarcation of the boundary between on the one hand, aircraft manufacturers and engine manufacturers which make up the population of main contractors at the summit, and on the other hand, the other parties. However, among these other parties, the distinction between equipment manufacturers and subcontractors is not always easy to establish. In fact, the specificities, both technical and commercial, of the sector are such that:

★ the main contractors participate most often in the product design and;

★ the supplier can only rarely sell to other clients a product customised for a given aircraft manufacturer, except if the products concerned are particularly basic (sensors, nuts, switches...).

The boundary is fine and the industry-based studies already carried out confirm the existence of a technical (Research & Development activity) or com-

mercial (capacity for breakdowns and/or repair) responsibility with regards to products or components, so as to classify a supplier in the category of equipment manufacturers rather than subcontractors.

This differentiation corresponds more or less to the general definition maintained by Eurostat *"subcontractors are those suppliers who have given technical specifications (point A of the definition) and who do not carry out commercialisation (point B)"* by bringing precision to the nature of the technical and commercial aspects which enable the establishment of an adequate division.

Equipment manufacturers are therefore characterised by the fact that they develop functions or systems according to their own patents and techniques, and they operate by respecting the specifications and terms of reference defined by the manufacturers for complete functions or sub assemblies: braking, undercarriage, propeller, radars, seats, escape slides... They generally work for many manufacturers, even for other industries (automobile). It is estimated that total equipment represents from 30% to 50% of the price of an aircraft depending on whether the aircraft is civilian or military[3].

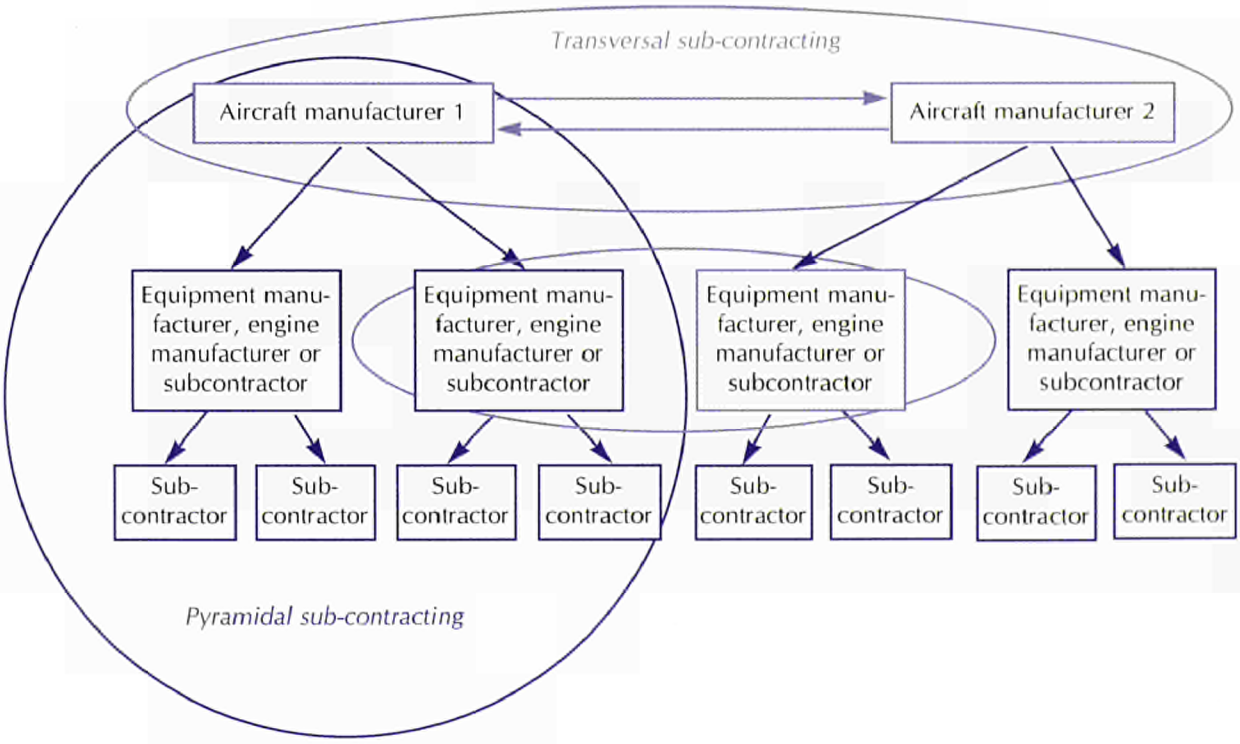
The equipment manufacturers evolve with the same business cycle as the aircraft manufacturers. When a reduction in orders occurs, they are equally affected, requiring plans to adapt to a decrease in investment and a reduction in subcontracting. But their size, their financial capacity and their relative autonomy classify them rather as partners of aircraft manufacturers and not as subcontractors. They therefore appear in the category of main contractors.

Three categories of parties can finally be distinguished:
- ★aircraft manufacturers and engine manufacturers;
- ★equipment manufacturers;
- ★and finally, subcontractors, who supply the other two categories.

The British study on the production line of the Eurofighter[4] describes clearly the case of second and third tier subcontractors: the three major contractors call on 314 different first tier subcontractors

Figure 6.6

The two forms of sub-contracting in the aeronautics sector



or suppliers. Among these 314 first tier participants, 165 responded to the SBAC survey and indicated that they themselves had 250 second tier suppliers. Four amongst them stated that, combining all tiers, they had 470 subcontractors or suppliers in total.

Pyramidal subcontracting therefore has common characteristics with those encountered in the automobile industry. For example, as in the manufacture of automobiles, it seems, according to results of a survey conducted in the United Kingdom[5], that the main contractors select their subcontractors on the basis of the following principal criteria (in order):

★ability to deliver within the deadline;
★quality;
★price of products.

Figure 6.7 (overleaf) classifies the other criteria put forward by aircraft manufacturers. Nevertheless, the rise in productivity seems to be the determining element in the establishment of a subcontracting relationship.

Subcontracting by aircraft manufacturers amongst themselves

Subcontracting in the industry covers two distinct domains:

★as is normal in other activities (and notably automobiles which have many common suppliers with aeronautics), it is carried out by enterprises who supply their products or services to aircraft, engine or equipment manufacturers, according to their specifications;
★but it is also carried out by aircraft manufacturers. More than in any other industrial activity, there exists in aeronautics important flows of subcontracting amongst the main contractors themselves. Hence, a main contractor, after having obtained an important contract, will entrust to other main contractors part of the work which his own production capacity cannot meet.

Industrial activity is characterised by lengthy development stages (five year minimum) and long manufacturing cycles (for example 18 months for the manufacture of an Airbus A330 in 1994). This implies there are frequent shifts from a period of operating at full capacity to another when there is ample spare capacity. The exchange of subcontracting work amongst aircraft manufacturers also improves the management of human resources.

Significance of subcontracting

In the countries where it is present, civilian and military aircraft manufacturing is, for industrial subcontracting, one of the most important activities. This is as a result of the structural importance of subcontracting: for France, a study[6] using the national definition of subcontracting states that the global volume of subcontracting is equivalent to 50% of intermediate consumption for the sector as a whole. For the Airbus[7] programmes in 1991, British Aerospace and Deutsche Airbus also subcontracted about half of their works, while Aérospatiale (F) subcontracted only 30% in this particular project.

But the importance of the volume of subcontracting in the different countries of the Union is strongly related to the weight of the aeronautics industry in each of the Member States. Therefore, there exist several thousand subcontractors in France (4,000) and in the United Kingdom (3,000), a few hundred in Germany (250) and in Italy (200) and around 50 in Spain[8]. In all probability, this figure includes equipment manufacturers.

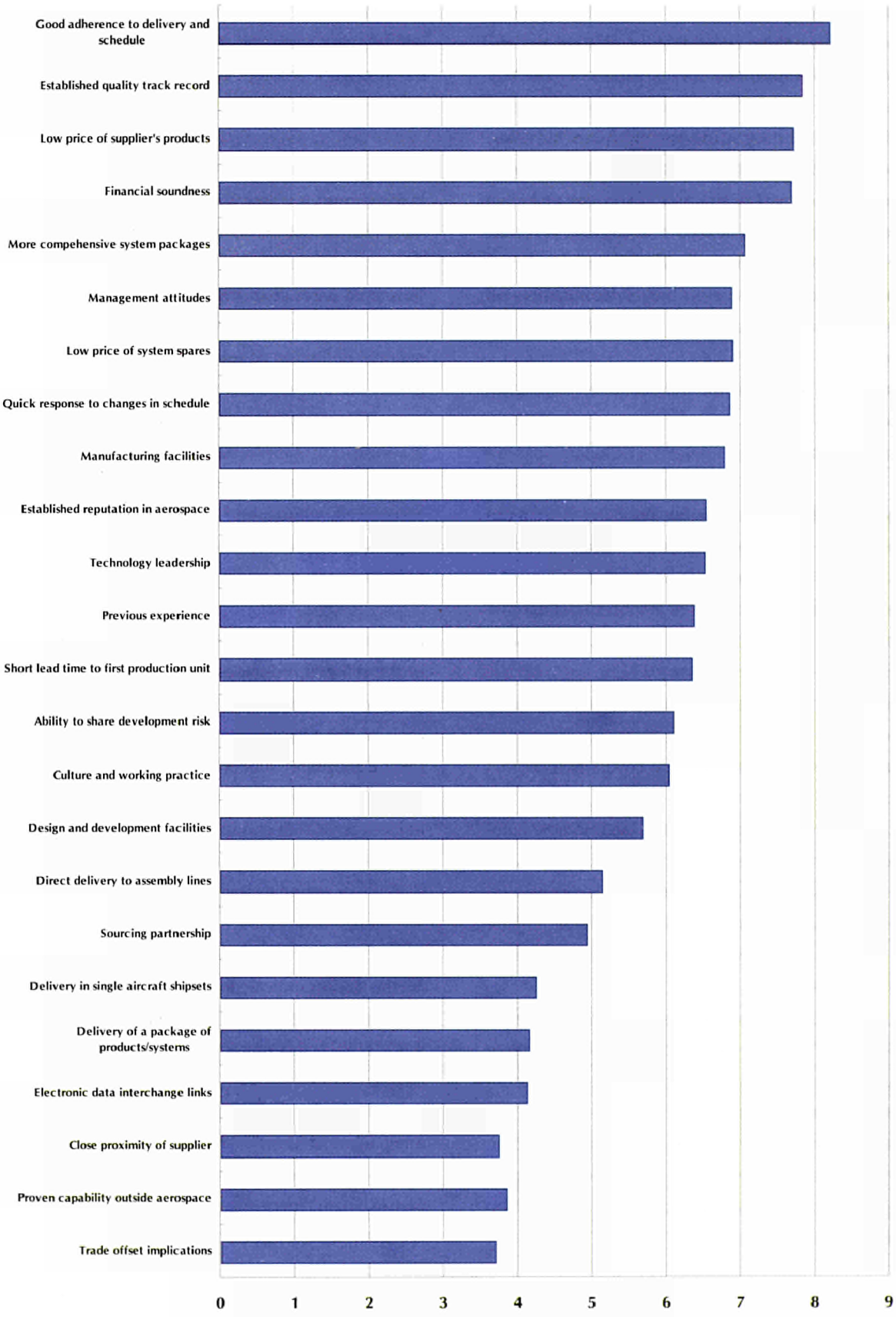
Size of subcontracting enterprises

All the studies indicate the small size of aeronautics subcontracting enterprises. It seems that 85% of the 4,000 French subcontractors and equipment manufacturers employ a staff of less than 100 persons, the most important enterprises being mainly equipment manufacturers[8]. This percentage is 75% for the United Kingdom and 70% for Germany. In Italy and in Spain, more than 50% of enterprises have less than 50 employees.

In general, the dependency on the aeronautics industry increases, the smaller the subcontracting enterprise.

Figure 6.7

Selection criteria for suppliers and sub-contractors (marked out of 10)



Source: Ingersoll Engineers Limited

This source is a reputable survey which presents results very similar to the ones found by Eurostat in their own surveys on subcontracting in the automotive and electronic industries.

Geographical localisation

In all the countries of the Union, whatever its weight in the national industry, industrial aeronautics is concentrated in a few regions. Hence, the Ile de France, Bavaria and the Madrid region have nearly 50% of the aeronautics production of each of the countries concerned[9]. This geographical concentration is even stronger when only subcontractors are considered. This results historically from subcontracting enterprises grouping in clusters around already present production, Research & Development or assembly facilities of aircraft manufacturers.

By country, the principal regions concerned are:
★Germany: the regions of Munich, Frankfurt and Hamburg;
★Spain: the Madrid region and the Basque country;
★France: Ile de France, Aquitaine, Midi Pyrenees, Provence/Cote d'Azur;
★Italy: Milan/Turin and the Naples region;
★United Kingdom: the Midlands and the south of England.

This phenomenon is not specifically European as in the United States 37% of aeronautics subcontracting is concentrated in California.

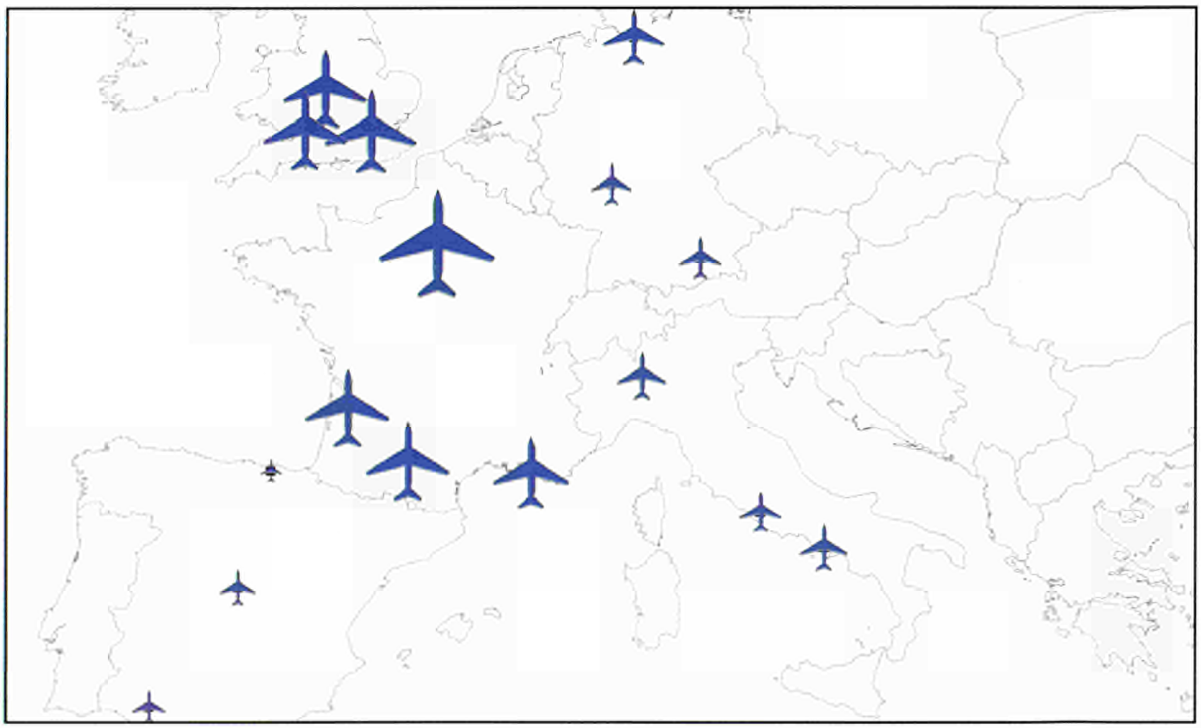
However, if history has determined the establishment of subcontracting enterprises close to the main contractors, it should be noted that these enterprises are less and less linked to the main contractors of the region, at least for the largest among them: hence, in the United Kingdom, only around 1/3 of the contracts of first tier subcontractors of the Eurofighter programme have been granted to British enterprises. The internal organisation of the programme explains, indeed, part of this situation, but it should also be noted that 30% of the value of an Airbus comes from the United States and equally 30% of the value of a Boeing 767 is not American[10].

As one goes down the pyramid this international contracting decreases: for the United Kingdom, first tier subcontractors choose up to 75% of second tier subcontractors from the domestic market.

Areas of activity

Main contractors in the aeronautics industry call on production and design capacities in numerous other industrial activities: foundries, metallurgical and metal works (machining, sheet metal manufacture, bodywork, general mechanics) as well as the manufacture of electric and electronic parts form the essence of subcontracting. Subcontracting is

Figure 6.8



Geographical localisation of subcontracting in the aeronautic industry in Europe

also found in chemicals (manufacture of paints and varnishes) and in the rubber and plastics industry (composite materials).

The proportion of subcontracting outside the aeronautics sector is high: for example, on the Eurofighter 2000 programme, SBAC[11] estimates that 2/3 of first tier subcontractors come from other sectors.

It is to be noted that specialists in the industry also consider as subcontractors certain service providers: computer consultancy, data processing, software programming, engineering and technical research, etc. Several companies, mainly in computer services, are in fact used by the manufacturers and the equipment manufacturers to carry out the "computerisation" of aircraft. The subcontracting relationships are interwoven (mainly by work under control), but it is not strictly speaking industrial subcontracting.

Other types of relationships have also been found recently with the regrouping of certain subcontractors: these are subcontracting of services supplementary to production, such as translation, marketing, etc. This division of certain functions may also generate a common access to Research and Development possibilities.

The areas of activity of subcontracting enterprises which were most exposed to the recession (other than the aeronautics industry) were, firstly foundry and metal works, followed by mechanical engineering. Electric and electronic engineering had more diversified markets.

Subcontracting specialisation and subcontracting capacity

Exchange of subcontracting amongst aircraft manufacturers has been mentioned already. The aeronautics industry seems characterised by a movement towards subcontracting more capacity. In France, the annual surveys of SESSI[12] calculate the ratio of specialisation subcontracting to total industrial subcontracting. For industry as a whole, this ratio is around 70% with small variations according to the years. For the aeronautics industry, this ratio shows a very high variability in the use of capacity subcontracting according to the state of the market: in 1990 subcontracting was made up of 46% speciality subcontracting. In 1993 this percentage had risen to 69% with a decline in global subcontracting figures.

The evolution of this ratio depends in fact on two factors:

- ★ the cyclical characteristic of the activity of main contractors;
- ★ the high sensitivity of subcontracting of capacity to economic circumstances.

In the recession, the subcontracting of capacity declines more than that of speciality, with the result of modifying the relative weights. An inverse movement is observed during periods of growth. Considering the length of the economic cycle, subcontracting serves as a barometer for economic change: its evolution forecasting that of turnover.

The subcontracting of capacity mainly encompasses the activities of mechanics, sheet metal manufacture, moulding, machining and electronic components. Specialisation subcontracting is found in activities such as precision engineering, electronics, plastics and composite materials.

Other characteristics of subcontracting enterprises

Subcontracting enterprises, which are generally small if equipment manufacturers are excluded, are subject to under-capitalisation. The dynamics of aeronautics being high up to 1992, led them to a significant indebtedness due to investment, the establishment of quality plans and the specialisation of personnel. The subcontractors were not ready for stagnation and even worse, a reduction in their orders, which mostly hit capacity subcontractors, especially in mechanics.

In addition, the majority of subcontractors report finding themselves in a situation of great financial constraint, owing to the development of short-term

debts linked to the conditions of payment of the main contractors (from 90 to 120 days) which have not been modified in spite of the current market situation.

As shown by surveys of national professional associations, the characteristics of subcontractors enable the differentiation of two types of enterprises:
★the first tier subcontractors whose size and organisational structure allow greater adaptation to changes: equipment manufacturers or huge diversified enterprises from other sectors;
★small production units, specialised in a trade and depending on a unique sector-based market which itself is characterised by a restricted number of main contractors.

In spite of structural adaptations already underway (greater use of first tier subcontractors, an orientation towards specialisation subcontracting, a policy of external growth if possible), some handicaps still exist. INSEE surveys in France in the Midi Pyrenees and Aquitaine regions show that:
★very few subcontractors have integrated the creation and development of a research department (most often due to lack of means);
★a minority (less than 20%) among them develop and market their own products;
★only a third have an industrial purchasing department;
★business action, when it exists, is not very structured. It does not exist in 50% of cases.

The effects of the downturn in aircraft manufacturing in the early nineties

In the aeronautic field, subcontracting is performed by numerous small enterprises which are fairly dependent on their main contractors. They were therefore directly hit by the downturn of activities which occurred at the beginning of the nineties for aircraft manufacturers. The lack of anticipation of this crisis and the huge change in expectations led to rapid adjustments in the outsourcing strategy of main contractors. Several surveys show that the workload of some subcontractors could have been halved within a calendar quarter.

In addition, the fall in orders led to pressure on prices which decreased by 10 to 30%. Previously prices were less important for main contractors who insisted mostly on quality and reliability.

With an industrial structure made up of small-sized enterprises, that are lightly or not diversified and that have been rendered financially weak by the weight of investments combined with significant payment delays and the tendency to emphasise technical quality rather than cost, such changes brought about the closing down of many enterprises.

Summary

As in the automobile industry, the extreme complexity of the product has led to a pyramidal organisation. Such an organisation enables a better specialisation in functions/personnel and hence a better allocation of investment, training, research, etc. There are therefore several tiers of subcontracting.

The complexity of the product also explains the length of manufacturing and the delays between the order and the delivery of an aircraft. The shortening of this delay is, with cost reduction, the principal reason put forward for the industrial organisation tending towards subcontracting. The increase in productivity is the determining element in the choice of "having someone do something".

However, the aeronautics industry is traditionally one where much subcontracting of capacity is also practised. This subcontracting of capacity which creates subcontracting relations between normally competing enterprises, including between aircraft manufacturers themselves, is extremely sensitive to the state of the market.

If subcontracting was established in the employment area surrounding the big aircraft manufacturers for historical reasons, it is now internationalised: main contractors as well as subcontractors have distant partners, including non-European ones.

The move to international subcontracting is marked by the fact that the dollar is the exchange currency in this market. This is not advantageous for European enterprises in the current period and new competitors in south-east Asia are in the process of taking their share of the market.

Whilst subcontracting of capacity mainly involves parties within the activity, speciality subcontracting is not internal to the aeronautics industry. The principal subcontractors are enterprises in the metallurgical industry and metal works, electric or electronic equipment and, for second-tier subcontractors, those in chemicals and plastics.

Subcontractors to the aircraft industry are small-sized enterprises (in general less than 100 employees) whose dependency with respect to the aeronautics industry is inversely proportional to their size: the smallest production units often work for only one main contractor, and even for a specific programme.

The downturn of the early nineties in the aircraft industry was felt through the whole production chain. A drop in orders occurred and was accompanied by a change in the outsourcing strategy of the main manufacturers. This led to critical problems for subcontractors especially among those who were the most dependent on the aeronautics activity.

Those who were better-off were those subcontractors who had diversified activities and those who had merged in order to equip themselves with means of Research and Development, as well as business resources, which would have been impossible to obtain without a certain size of enterprise.

For their part, main contractors, aircraft manufacturers, engine manufacturers, and equipment manufacturers aim to reduce their number of first tier subcontractors by requesting whole systems from them.

The subcontracting of whole functions (communications, security, navigational aids) began to replace the subcontracting of parts which was not optimal (for example from the investment point of view). This type of subcontracting includes subcontracting of services such as design of systems, software, etc. It has developed especially for electronic equipment for aircraft.

Finally, subcontracting in this industry is also explained in part by the wish of main contractors to transfer the risks associated with investment and with variations in the exchange rate of the dollar. Unfortunately, these risks affect all tiers of subcontractors who generally are not armed with the same means to protect themselves. On the contrary, many subcontractors are often in debt in order to obtain the necessary investment.

Notes

1 Source: Bulletin économique de la SFAC - September 1994
2 Source: Les Echos -Industrie
3 Source: Fédération des Industries Mécaniques - France
4 Source: Society of British Aerospace Companies
5 By the cabinet of consultants Ingersoll Engineers Limited
6 Source: Fédération des Industries Mécaniques
7 Source: Interavia aerospace review
8 Source: cabinet LEK: Study of subcontractors, suppliers and equipment manufacturers in the European aeronautical industry
9 Source: cabinet LEK
10 Source: magazine Interavia quoting Airbus figures
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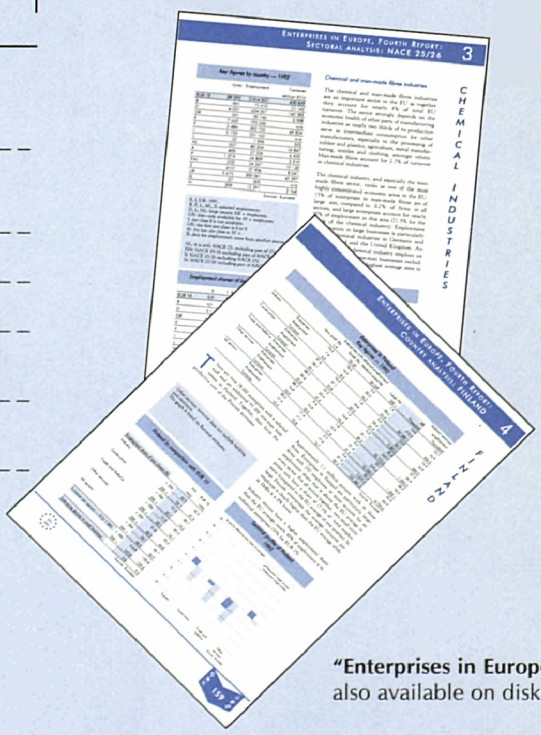

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