

# Special feature on country profiles in European manufacturing



EUROPEAN  
COMMISSION



THEME 4  
Industry,  
trade  
and services

4

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>).

Cataloguing data can be found at the end of this publication.

Luxembourg: Office for Official Publications of the European Communities, 2000

ISBN 92-894-0435-3

© European Communities, 2000



**TABLE OF CONTENTS:**

**1. DYNAMICS OF MANUFACTURING ..... 1**

**2. STRUCTURE CHANGES TOWARDS TECHNOLOGY DRIVEN AND KNOWLEDGE  
BASED INDUSTRIES..... 6**

**3. COUNTRY PROFILES..... 10**

**REFERENCES ..... 46**

## **1. Dynamics of manufacturing**

The manufacturing sector contributed about 1400 bn Euro to the GNP of EU-member countries in 1998, amounting to one fifth of the value added of all sectors. Given its larger share in exports, the intimate connection between manufacturing, transport, electricity and construction, and finally the importance of manufacturing as a user, as well as a producer of business services, the key role played by manufacturing in growth and competitiveness of Europe becomes evident. On the policy side, the creation of the European Union, the Single Market Program and the upcoming Monetary Union have eliminated borders, non tariff barriers and many kinds of “transaction” costs between the countries, bringing Europe nearer to being a regional entity without barriers and with common rules of production. However, even in a large European market without barriers, the industrial structures of member countries continue to differ, as do endowments, wages, and corporate and competitive advantages. These factors create, as well as reflect, the strengths and weaknesses of regions and countries. As far as industrial structure is concerned, the integration process as such works in two directions: on the one hand endowments and factor costs become more similar, as plant locations shift and firms go multinational, jobs and people move, and innovation disseminates. Finances are raised internationally, differences in firm governance fade, and legal frameworks become European. On the other hand, this very increase in flexibility and mobility implies that even small differences in prices and endowments between countries gain importance, resulting in shifts in production and pressure for reorganisation.

The objective of this report is to provide an illustration of country profiles for manufacturing. It is investigated how growth differs, in which type of industries countries are specialised, and how they are positioned in quality and productivity. The profiles change over time and reveal the strengths and weaknesses of the countries. The performance of each individual country is benchmarked against the performance of the European Union. At the beginning a few figures on the overall performance of the EU are presented. However, comparing Europe with the USA and Japan is not the focus of this report. Competitiveness in the triad is, for example analysed, in the annual Reports on the Competitiveness of European industry (e.g. 1998, 1999, and 2000), in which Europe is also benchmarked against the USA and Japan. More details on the individual industries are presented in Panorama 1999. The 300 leading firms which determine the country profiles together with the large number of small and medium sized firms are reported and strategies of multinationalisation and product diversification are characterised in Davies, Lyons (1999) (Box 1).

### Box 1: Recent overviews on European manufacturing

Author/Institution	Title	Scope	Additional features
EUROSTAT	Panorama of European business	Main trends for industries	Overview on structure and performance
European Commission, 1998	The competitiveness of European industry 1998	Competitiveness in the triad	Taxonomies, small firms, multinationals
European Commission, 1999	The competitiveness of European industry 1999	Adaptability and change	Intangible investment, Asian crisis
European Commission, 2000	The competitiveness of European industry 2000	Competition in quality	Service inputs, pharmaceuticals
Aiginger, K. et al., Enterprise DG, 1999	Specialisation and (geographic) concentration of European manufacturing	Degree and change in specialisation and geographic concentration	Survey on liberalisation, growth differences
Peneder, M., Edward Elgar, 2001	Entrepreneurial competition and industrial location	Theoretical and empirical overview	Background for three taxonomies
Davies, St., Lyons, B., Oxford Press, 1990	Industrial organisation in the EU	Strategies of leading firms	Matrix on 300 leading firms
Ilzkovitz, F., Dierx, A., European Economy, 2000	European integration and the location of industries	Overview on studies concerning specialisation	Survey on liberalisation, growth differences
Bonder, M., Student, T., Metropolitan, 2000	Wem gehört was in Europa	Facts about large firms	Industry leaders and country champions
Aiginger, K. et al., Enterprise DG, 2000	Europe's position in quality competition	Country shares in price on quality sensitive industries and in high/low price segments	Importance of quality competition for Europe
Braunerhjelm, P. et al., CEPR, 2000	Integration and the Regions of Europe	Concentration and specialisation of regions	Policy impact on income differences agglomeration, catching up

Real production in manufacturing in the EU increased between 1985 and 1998 by 30%, or by 2% per annum. In nominal terms, annual growth amounted to 3.7%. Manufacturing exports (which are measured in nominal terms) expanded faster than production. Extra growth was 7.2% between 1988 and 1999, reflecting the trend of globalisation. The strongest stimulus however came from intra growth and is integration based: exports to member countries rose by an impressive 8.5% per annum. Total manufacturing exports thus grew by 8.0% per annum, doubling in less than 10 years. 63% of total exports in manufacturing are exports to other member countries (intra trade) and 37% are shipped to non-members (extra trade). Taking all exports into consideration, 46% of total manufacturing production was exported in 1998; 17% if we refer to extra exports only. The EU countries enjoyed a large trade surplus for manufacturing of 118 bn ECU (1999), up from 16 bn ECU in 1988.<sup>1</sup>

23 million people are working in manufacturing. This is down from 26 million in 1985, marking a decline of 0.9% per annum. In the second half of the nineties, decline seems to have levelled off due to higher growth in some countries and measures to spread employment. For the total period, only four countries were able to increase employment in manufacturing (Ireland, Spain, Denmark, Netherlands). As a general trend over the long run, employment in manufacturing will tend to decrease, as long as its real growth is not higher than 3% to 4%. The decline of manufacturing employment is the other side of the productivity increase. Real value added per employee increased on average by 2.9% over the total period. Wages per employee increased annually by 4.3% (nominal), unit labour costs were constant (0.2% p.a.). All these figures refer to manufacturing proper and do not incorporate the positive impact of manufacturing on jobs in business related services (nor construction and energy, which are sometimes included in the definition of “industry”).

<sup>1</sup> This figure is for total exports (intra and extra). This is the case whenever “exports” and “imports” are not otherwise specified. Extra exports are defined as exports with non member countries, intra exports is defined as exports with member countries.

Table 1: Dynamics of growth and employment 1985 to 1998

	Manufacturing		Total economy
	Real production	Employment	Real GDP
Belgium	2,5	-1,3	2,2
Denmark	2,3	0,4	2,5
Germany	1,7	-1,2	2,5
Greece	0,2	-2,1	1,9
Spain	2,6	0,3	3,1
France	1,4	-0,9	2,0
Ireland	10,2	2,2	6,8
Italy	1,8	-0,6	1,8
Luxembourg	2,1	-0,9	5,7
The Netherlands	1,8	0,4	2,8
Austria	3,9	-1,4	2,6
Portugal	2,2	-0,1	3,6
Finland	3,8	-1,3	2,2
Sweden	3,2	-1,0	1,5
United Kingdom	1,7	-1,7	2,4
EU	2,0	-0,9	2,5

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 2: Dynamics of exports

	Export growth 1988 to 1999			Export share 1999	
	Intra	Extra	Total	Intra	Extra
Belgium	8,1	7,1	7,9	79,2	20,8
Denmark	10,0	2,8	6,9	66,4	33,6
Germany	5,6	5,2	5,4	55,7	44,3
Greece	5,2	10,5	7,4	51,1	48,9
Spain	11,4	6,4	9,7	70,8	29,2
France	7,7	6,9	7,4	62,2	37,8
Ireland	12,6	17,0	13,9	64,8	35,2
Italy	6,5	6,5	6,5	57,3	42,7
The Netherlands	7,8	6,5	7,5	77,2	22,8
Austria	6,8	10,0	8,1	62,4	37,6
Portugal	9,8	3,9	8,5	82,8	17,2
Finland	6,9	7,4	7,4	57,6	42,4
Sweden	6,4	7,5	6,7	57,4	42,6
United Kingdom	9,5	6,2	8,0	59,1	40,9
EU	8,5	7,2	8,0	62,9	37,1

Source: WIFO calculations using EUROSTAT (COMEXT); nominal exports.

Table 3: Country shares in Europe 1999

	Exports	Imports	Exports	Imports	Trade balance
	in Mio ECU		in % of EU		in Mio ECU
Belgium	153469	138888	8,3	8,0	14581
Denmark	40518	38967	2,2	2,2	1551
Germany	446345	348975	24,1	20,1	97370
Greece	8008	23869	0,4	1,4	-15861
Spain	89674	111862	4,8	6,4	-22189
France	279625	268626	15,1	15,5	11000
Ireland	59410	38670	3,2	2,2	20740
Italy	209443	176920	11,3	10,2	32523
The Netherlands	160817	151804	8,7	8,7	9013
Austria	55837	62352	3,0	3,6	-6516
Portugal	21919	32198	1,2	1,9	-10278
Finland	38913	25458	2,1	1,5	13455
Sweden	73639	55572	4,0	3,2	18067
United Kingdom	218048	263747	11,8	15,2	-45699
EU	1855664	1737907	100,0	100,0	117757

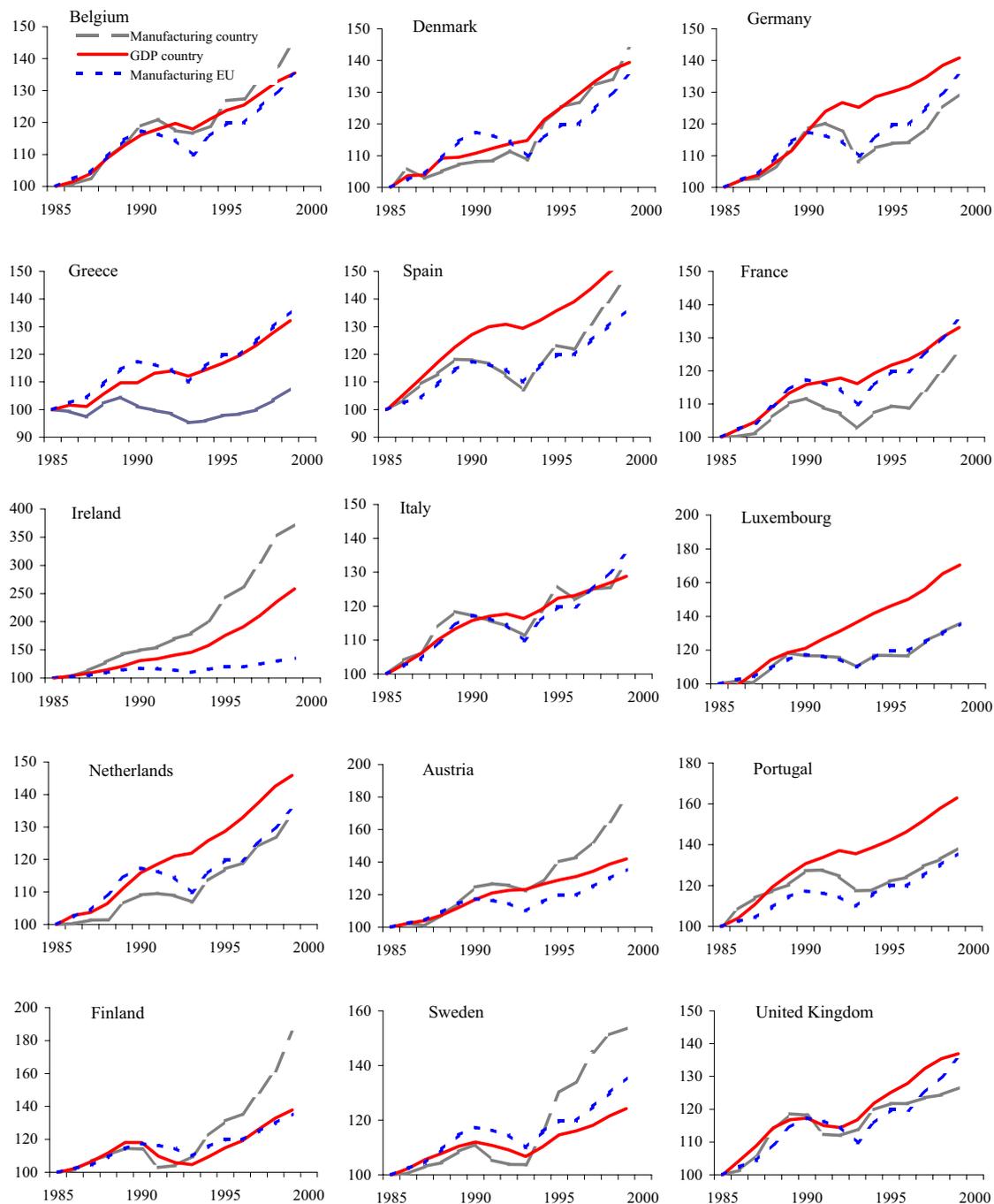
Source: WIFO calculations using EUROSTAT (COMEXT); total trade (extra plus intra), nominal figures.

Table 4: Wages, productivity and price competitiveness

	Wages		Value added		Increase of unit labour costs			
	per head 1998		per head 1998		in international currency			
	EU = 100		EU = 100		1985-1990	1990-1995	1995-1999	1985-1999
Belgium	34795	135,8	75980	154,1	1,1	2,0	-0,2	1,0
Denmark	33044	129,0	50215	101,8	3,3	0,7	4,1	2,6
Germany	32943	128,6	54196	109,9	1,8	1,1	-2,3	0,3
Greece	14384	56,1	21714	44,0	0,5	-0,6	2,6	0,7
Spain	15333	59,9	32995	66,9	3,8	-3,6	2,8	0,9
France	24752	96,6	49357	100,1	-0,9	-0,4	-0,7	-0,7
Ireland	20556	80,2	77740	157,6	-5,3	-3,0	-0,2	-3,0
Italy	22552	88,0	50240	101,9	2,4	-6,7	3,4	-0,7
The Netherlands	29155	113,8	59596	120,8	0,4	1,0	0,4	0,6
Austria	30868	120,5	59935	121,5	-0,4	0,5	-2,6	-0,7
Portugal	9859	38,5	16719	33,9	3,4	3,9	1,4	3,0
Finland	26668	104,1	57313	116,2	1,6	-6,5	0,3	-1,7
Sweden	23076	90,1	54117	109,7	1,5	-7,1	3,6	-1,1
United Kingdom	25080	97,9	50655	102,7	-1,8	-1,3	10,4	1,7
EU	25618	100,0	49319	100,0	0,8	-1,4	1,7	0,2

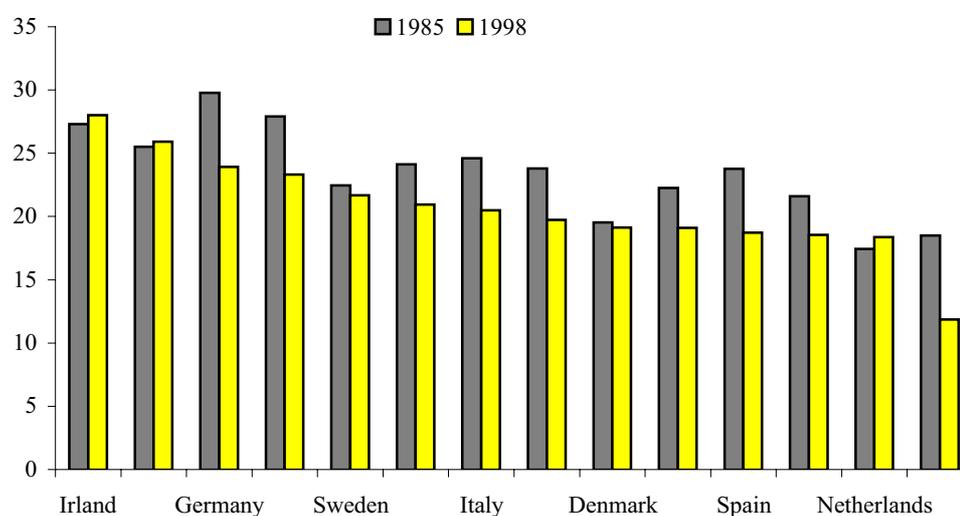
Source: WIFO calculations using EUROSTAT (COMEXT).

Figure 1: Real growth in GDP and manufacturing 1985 to 1999 (1985=100)



Source: EUROSTAT (NEW CRONOS).

Figure 2: Manufacturing share in GDP  
(Ranked according to size of manufacturing 1998)



Source: WIFO calculations using EUROSTAT (NEW CRONOS).

## 2. Structure changes towards technology driven and knowledge based industries

There are many ways to describe the structure of manufacturing. The NACE classification reports 22 broad categories. Two digit numbers label them; it is referred to them as industrial sectors<sup>2</sup>. Most sectors are disaggregated into more narrowly defined markets, namely 99 three-digit categories, which we call industries. There are three new taxonomies available, which summarise the individual industries into rather homogenous categories and are constructed against the background of economic theories. The classifications were made for the European Commission for the Competitiveness Reports 1998, 1999 and 2000 using cluster analyses. The theoretical background and technical procedure for implementation is presented in Peneder (2001).<sup>3</sup>

The first taxonomy classifies industries according to factor inputs labelling them as labour intensive, capital intensive, technology driven, and marketing driven industries if the specific factor is important for the industry. Industries in which factor input does not differ from those characterising total manufacturing are summarised as mainstream industries. This taxonomy fits the background of trade

<sup>2</sup> Manufacturing is defined as NACE 15 – 36; industries 151 – 366.

<sup>3</sup> EU 1998, 1999, 2000, Peneder, 2001.

theories which stress the decisive role of factor endowments and prices in trade, and modern industrial organisation, emphasising the importance of optimally chosen research and marketing outlays in maintaining profitability and market power (endogenous sunk costs).

European manufacturing has transformed its structure: labour and capital intensive industries have made way for marketing and technology driven industries. Specifically, the share of capital intensive industries decreased from 17.5% in 1985 to 14.6%, and is now the smallest sector according to this taxonomy. The largest decreases were in steel, petroleum, and fibres. The share of labour intensive industries declined by half a percentage point, now accounting for 15.6%, but is still larger than the same sector in the USA (European Commission, 1998, Peneder, 2001). Marketing driven industries in this sector are growing at a rate of 4.0 % annually and now produce 21.2% of manufacturing. Dynamic industries are recorded media, publishing and printing, and sports goods. Technology driven industries are exhibiting the highest growth rate (4.2% per year) and are producing 23% of manufacturing. However, their share, growth and above all productivity are higher in the USA than in Europe. Relatively stable is the share of those industries whose input structure does not differ significantly from the average: mainstream industries contribute to more than a quarter of value added in Europe.

Table 5: European manufacturing according to factor inputs

	Shares in total value added in EU														Change 1998-1985	Growth 1985-1998
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998		
Mainstream industries	24,7	24,6	24,6	24,6	24,8	25,5	25,6	25,8	25,8	25,6	25,6	25,9	25,5	25,6	0,9	3,9
Labour intensive industries	16,1	15,8	15,9	15,8	16,1	16,6	16,6	16,5	16,1	15,9	15,5	15,6	15,3	15,6	-0,5	3,4
Capital intensive industries	17,5	17,4	17,2	17,7	17,3	15,5	14,2	13,9	13,8	14,8	16,4	15,1	15,3	14,6	-3,0	2,2
Marketing driven industries	20,2	20,3	20,3	19,8	19,8	20,5	21,4	21,9	22,7	21,9	21,0	21,5	21,3	21,2	1,0	4,0
Technology driven industries	21,5	21,9	22,0	22,1	22,0	21,9	22,2	22,0	21,6	21,9	21,4	21,9	22,5	23,0	1,6	4,2
Manufacturing	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	0,0	3,7

Source: WIFO calculations using EUROSTAT (NEW CRONOS). Change in percentage points, growth of nominal value added.

The second taxonomy classifies industries according to skill classes. It distinguishes between industries relying on low skill and high skill levels, as well as two middle categories. Medium skill industries are further divided into those with high blue collar and high white-collar shares, respectively. We therefore have four industry groups according to skill patterns. The economic background is such that high wage countries have to specialise in skill intensive sectors with high spillovers across industries. The share of low skill industries is decreasing from 32.1% to 30.1% in the period of observation; specifically, leather industries, footwear and textiles are contributing to this trend. On the other hand, the share of high skill industries is increasing to 16.7%, a level that, however, is still lower than in the USA and in Japan. Among the medium skill industries, those with a high proportion of blue-collar workers are faring better, motor vehicles, metal industries and sports goods are included in this group.

Table 6: European manufacturing according to skill inputs

	Shares in total value added in EU														Change 1998-1985	Growth 1985-1998
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998		
Low skill industries	32,1	31,8	31,8	31,7	31,6	31,5	31,7	31,8	32,0	31,8	31,2	30,7	30,6	30,1	-2,0	3,1
Medium skill/blue collar work	20,4	20,4	20,8	20,8	21,2	21,4	21,5	21,9	21,0	21,3	21,7	21,8	21,8	22,6	2,3	4,5
Medium skill/white collar work	31,2	31,6	31,4	31,5	30,8	30,3	29,9	29,9	30,8	30,9	31,0	30,9	30,9	30,6	-0,6	3,5
High skill industries	16,4	16,2	16,0	16,1	16,3	16,8	17,0	16,4	16,3	16,1	16,1	16,6	16,8	16,7	0,4	3,8
Manufacturing	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	0,0	3,7

Source: WIFO calculations using EUROSTAT (NEW CRONOS). Change in percentage points, growth of nominal value added.

The third taxonomy distinguishes between industries according to the types of services used. Some industries are characterised by a high input from transport services, while a second group is characterised by high inputs from retail and advertising services. Specifically attractive are industries with a high input of information and knowledge-based services; these industries provide the basis for competitiveness and growth in the upcoming information society. Industries characterised by high inputs from knowledge-based services increased their share in manufacturing to 19.3% (from 18.5% in 1985). Industries with a high input from retail and advertising are the second group, which is winning shares. Industries with high inputs from transport services are stable, and the group whose service input does not differ from the manufacturing total is losing shares.

Table 7: European manufacturing according to service inputs

	Shares in total value added in EU														Change 1998-1985	Growth 1985-1998
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998		
Industries with high inputs from information and knowledge-based services	18,5	18,2	18,2	18,7	18,7	18,3	17,9	17,6	17,7	18,0	18,7	18,9	19,3	19,3	0,8	4,0
Industries with high inputs from retail and advertising services	26,8	26,8	26,8	26,6	26,6	27,6	28,2	28,3	28,8	28,1	27,4	28,1	28,0	28,1	1,3	4,0
Industries with high inputs from transport services	23,6	23,7	23,8	24,7	24,8	24,1	23,6	23,5	23,4	24,1	24,9	23,9	23,8	23,7	0,1	3,7
Other industries	31,2	31,3	31,2	30,0	29,9	30,0	30,2	30,6	30,1	29,8	29,0	29,1	28,9	29,0	-2,2	3,1
Manufacturing	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	0,0	3,7

Source: WIFO calculations using EUROSTAT (NEW CRONOS). Change in percentage points, growth of nominal value added.

Data are mainly taken from EUROSTAT databases, NEW CRONOS (SBS Domain) and COMEXT. Data on aggregate manufacturing are available for 1985 – 1999; at a disaggregated level, only nominal data are available. In some cases, missing values had to be estimated, in order to enable the necessary aggregations. Exports are available for 1988 to 1999. If not otherwise specified, the analysis refers to nominal value added<sup>4</sup> and to exports, for 1985 to 1998 and 1988 to 1998 respectively. Information on other variables, from other sources, for additional years (e.g. 1999) was used when available and meaningful.

<sup>4</sup> In describing country profiles the terms value added, production, and output are used interchangeably. For defining export ratios (exports/production) and for openness (imports plus exports taken together and related to production) production proper is used (which differs from value added mainly by the inclusion of material inputs).

Figure 3: Market shares of countries in the EU

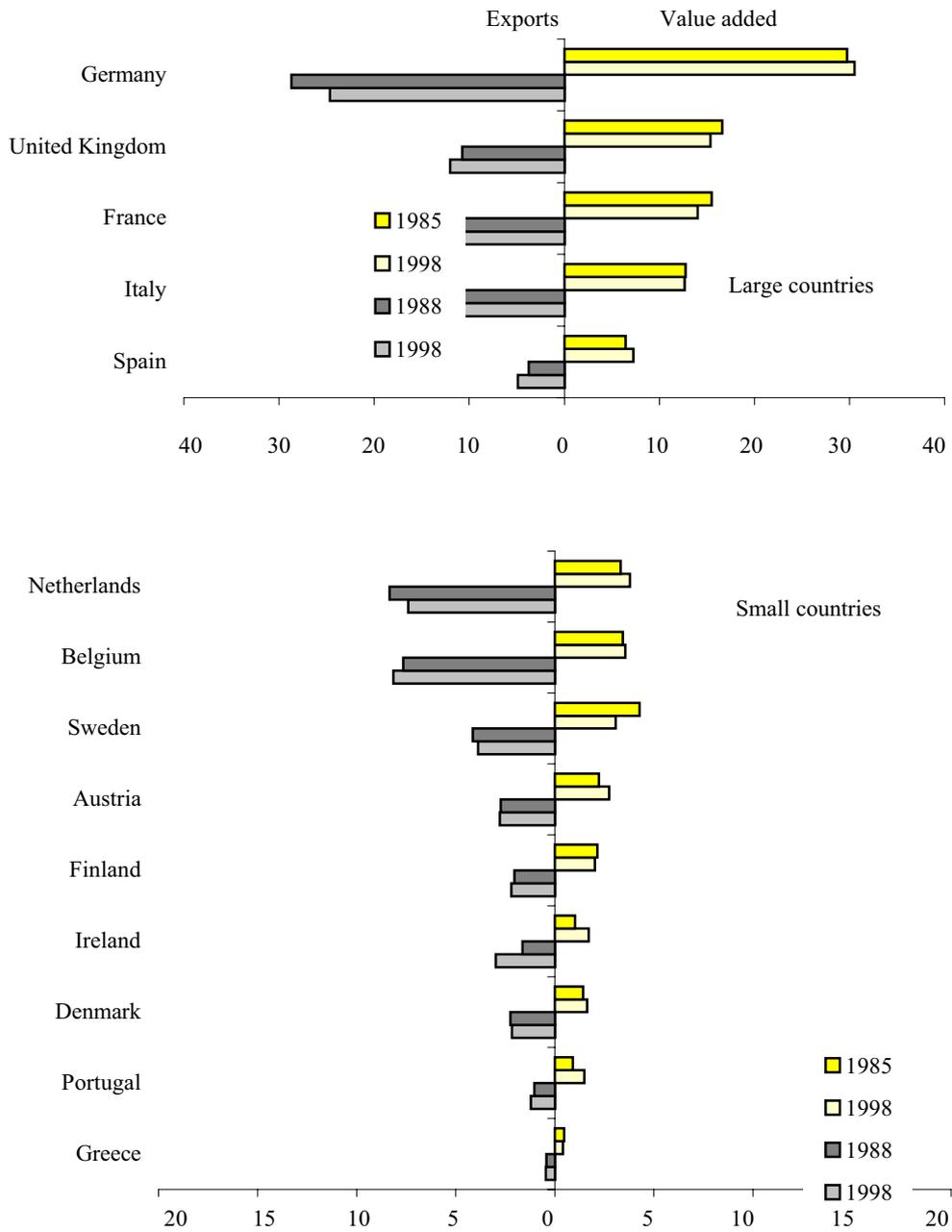
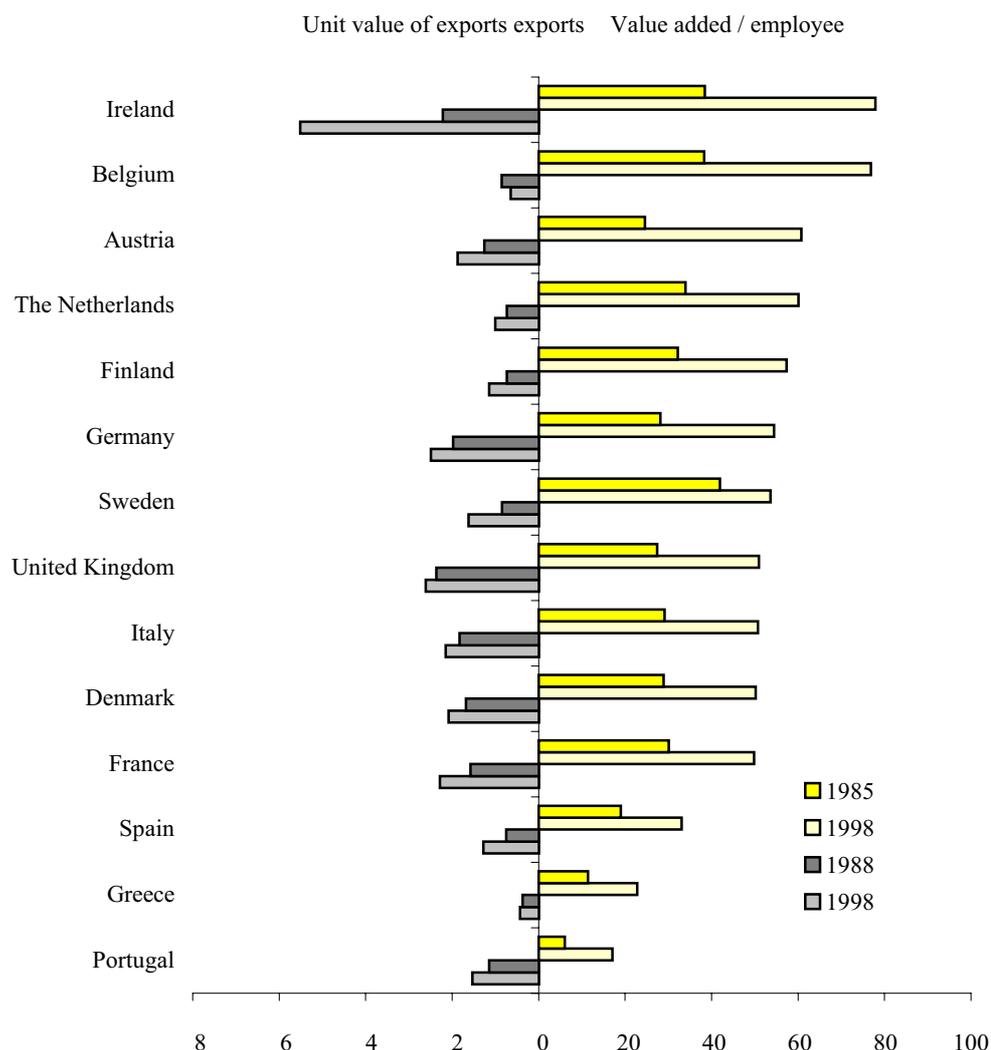


Figure 4: Productivity and unit value of exports (1985/88 and 1998)



### 3. Country profiles

This chapter describes the role, dynamics and structure of the manufacturing sector in the individual EU-Member countries. While for most of the tables, the countries are listed in the order which generally appears in EU documents (alphabetically in the native language of each country), the report starts here with the North (including Ireland, the United Kingdom and the Nordic member countries), then proceeds to descriptions of the core economies in the geographical sense and closes with a group which includes Austria and the southern countries.

#### *Skills meet foreign capital*

The fastest growing European economy is **Ireland**, which gained excellent positions in productivity, export performance and quality. Manufacturing is growing by 10% per annum (in real terms). The

manufacturing share of GNP is rising, and is now, at 32%, by far the highest in Europe (followed by Finland with 26%). Exports are growing by 14% per annum, with extra exports growing faster. The share of exports to the USA doubled since 1988 and amounts now to 16.3%, exports to Japan and to Switzerland also grew very fast. The share of extra EU exports is however still below average, partly due to the high – albeit declining - share of exports to the UK (21%). Ireland supplied 1% of European production in 1985, today it produces 1.7% of European manufacturing. Export market share has doubled, now reaching 3%, which is a larger share of total European exports than is held by countries with larger populations. Export relative to production is the highest of all member countries and is growing faster. Productivity growth in Ireland is also rising more strongly than in any other EU country, pushing Ireland into first place in value added per employee. This position of excellence may contain an element of inflated transfer prices, but the dynamics of the Irish economy, and its quantitative and qualitative success is beyond statistical doubt. The share of production in marketing driven, technology driven industries and industries characterised by high inputs from knowledge-based services is higher than in other countries; research outlays and the use of information and communication technology is increasing. The share of low skill industries, which had been historically high, is now average that of mainstream and labour intensive industries below average. Quality indicators reflect the strong position of Irish manufacturing in the higher price segment. Price competition is of significant importance in some of the technology driven industries in which Ireland has high shares (computers, electronic valves), reflecting the objective of the past strategy to build on cost advantages, tax incentives and regional support programs, which have attracted many multinational firms<sup>5</sup>. Wages per capita are still 20% below European average. However, the financial support and the reliance on low wages would not have been able to create the strength and competitiveness of today's Ireland, if they were not combined with supply of skilled labour, a friendly climate for innovation and change, and the policy focus on establishing upstream linkages between foreign firms and indigenous companies.

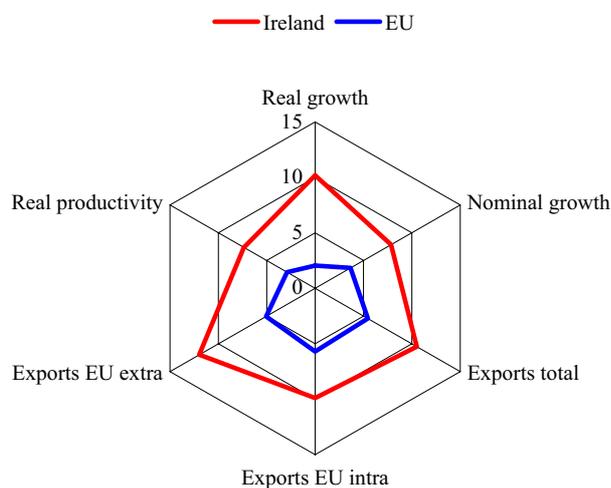
Chemicals are presently the largest sector. Food was previously the most important sector, its production share has dropped from 26.7% to 20.1%, and its export share is now about 10%. Within chemicals, basic chemicals as well as pharmaceuticals are strong, each supplying about 15% of Irish exports, all chemicals together accounting for 38%. Computers are second in exports, telecom equipment third. 15% of European computer exports and 10% of total European exports in chemicals come from Ireland. Traditional strongholds in dairy products and other food categories are being maintained, while medical equipment (7%) and optical instruments (4%) are further high tech industries with high market shares in European exports. Research outlays are increasing; multinational

---

<sup>5</sup> Ireland got 2% of GDP by structural funds of the EU but attracted 8% of GDP by instruments of multinational firms. Greece and Portugal got structural funds approximately in the same magnitude, but attracted less than 1% and 3% respectively by investments of multinationals (Braunerhjelm et al., 2000).

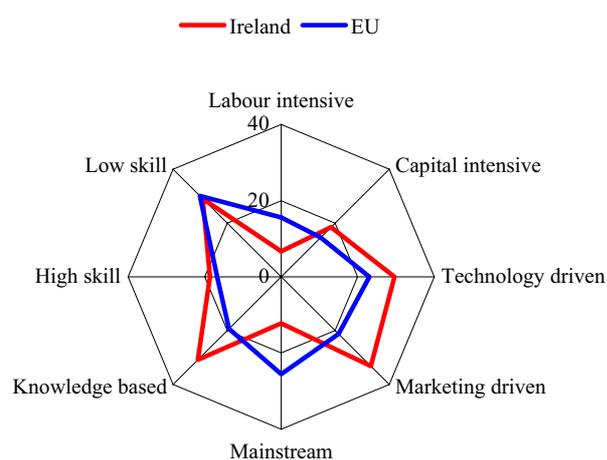
firms are making 70%. Ireland has today the highest share of industries characterised by high inputs from knowledge based services specifically recorded media and medical equipment.

Figure 5: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 6: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 8: Country profile: Ireland

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	14,2	14,6	12,2	-10,5	-10,8	-13,4
Labour intensive	9,8	9,3	6,7	-6,3	-7,3	-8,9
Capital intensive	17,3	13,3	18,4	-0,3	-2,2	3,8
Marketing driven	39,8	41,8	33,2	19,5	21,3	12,0
Technology driven	19,0	21,0	29,6	-2,5	-0,9	6,6
<b>Skills</b>						
Low skills	44,1	43,3	28,9	12,0	11,9	-1,2
Medium skills/blue collar workers	8,4	8,2	6,7	-11,9	-13,2	-15,9
Medium skills/white collar workers	33,6	33,7	45,8	2,4	3,4	15,2
High skills	13,9	14,8	18,6	-2,5	-2,0	1,8
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	22,8	21,9	30,7	4,4	3,6	11,4
Industries with high inputs from retail and advertising services	41,6	41,3	37,4	14,9	13,7	9,4
Industries with high inputs from transport services	17,0	16,9	16,7	-6,7	-7,2	-7,0
Other industries	18,5	19,9	15,2	-12,6	-10,1	-13,8

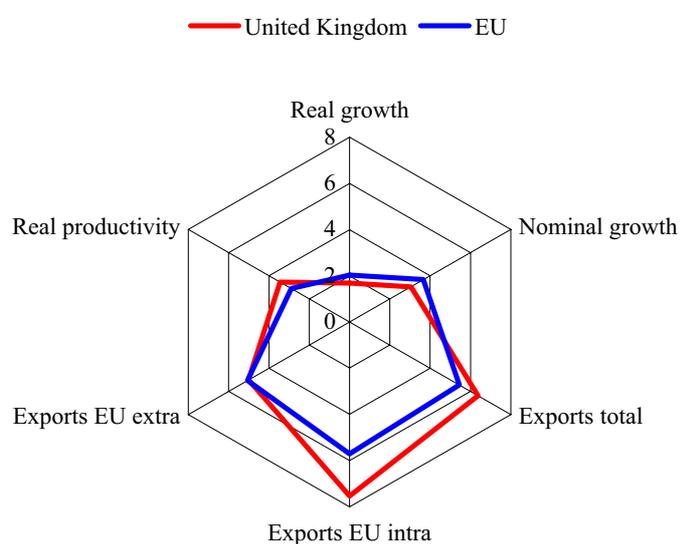
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

### *Headquarter services and knowledge for globalisation*

The **United Kingdom** produces 15% of European manufacturing output, the second largest production share among member countries. It is growing by 1.7% per annum (in real terms); both real growth and nominal growth are below average. The share of manufacturing in GDP is now below the European average and is less than 20%. The UK's production share in Europe is decreasing, but exports are growing faster than production and than the exports of the partner countries. Exports are driven by intra exports, illustrating the deepening of integration with mainland European countries (trade with Ireland is increasing absolutely, but shares of exports and imports to and from Ireland are decreasing). The trade balance remains negative, and the UK's export market share is third, following Germany and France. Openness, as well as productivity, productivity growth and the growth of wages are about the European average. The UK enjoys the second highest unit value of exports, reflecting not only structural change towards industries characterised by high inputs from knowledge-based services, but also its position as headquarters and export hub for high technology products. Marketing driven industries have a significantly higher share than in the EU, for technology driven industries, this is the case to a lesser extent. Industry structure according to skill patterns is similar to other countries, labour and capital intensive industries have an underproportional share.

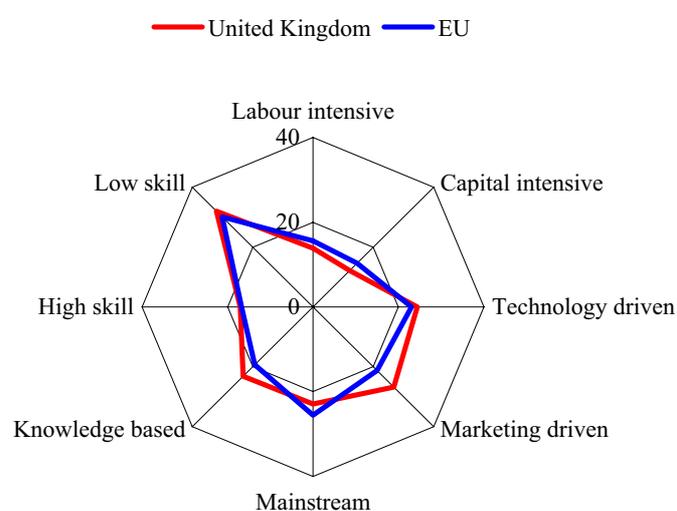
Food is still the largest sector in production, but its export share is decreasing and amounts to less than half of the production share. Chemicals, machinery and vehicles follow with identical rankings in 1985 and 1998. The highest increase in production and a specific specialisation of the UK can be observed in printing and publishing, which now amount to 8% of production. More than 20% of European production and exports in the EU come from the United Kingdom. High market shares have also been attained by office machinery and telecom equipment; in these two industries, firms with locations in both Ireland and United Kingdom use the UK as an export hub. On the industry level, the UK has high market shares in publishing, process and control equipment, as well as in beverages and other food.

Figure 7: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 8: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.  
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 9: Country profile: United Kingdom

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	23,7	23,9	22,9	-1,0	-1,6	-2,7
Labour intensive	15,7	15,3	13,9	-0,4	-1,3	-1,8
Capital intensive	15,4	12,8	12,1	-2,1	-2,7	-2,5
Marketing driven	24,3	24,7	26,7	4,1	4,2	5,5
Technology driven	20,9	23,3	24,4	-0,6	1,5	1,4
<b>Skills</b>						
Low skills	32,9	32,6	32,0	0,8	1,1	1,9
Medium skills/blue collar workers	19,0	19,4	19,6	-1,4	-2,0	-3,0
Medium skills/white collar workers	32,3	30,3	31,4	1,1	0,0	0,8
High skills	15,9	17,8	17,1	-0,5	0,9	0,3
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	21,9	22,3	23,1	3,4	4,0	3,8
Industries with high inputs from retail and advertising services	25,4	26,0	27,9	-1,4	-1,6	-0,1
Industries with high inputs from transport services	23,2	24,1	22,9	-0,4	0,0	-0,7
Other industries	29,5	27,6	26,0	-1,6	-2,5	-2,9

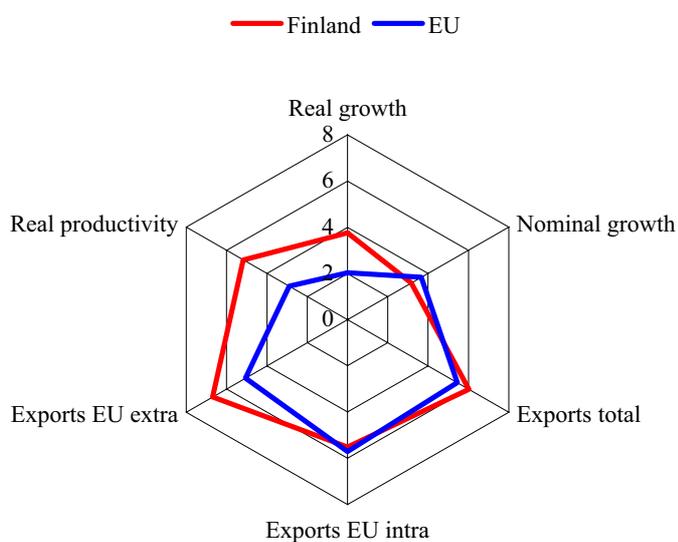
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

### *From forestry to telecom*

**Finland** overcame strong shifts in regional and sectoral demand during the nineties, partly through a strong devaluation of its currency, partly through a dramatic shift to technology driven industries. Manufacturing over the total period is higher in real terms, but lower in nominal terms (the latter reflecting the devaluation). Average growth conceals the absolute decline in production during the crisis and the boom in manufacturing since then. Exports reflect a similar pattern, remaining within the European average over the entire period. Extra exports rose faster, though the extra share in the total is already one of the highest of the member countries. As far as the export share and openness is concerned, Finland is in a moderate position. The same is true for absolute productivity, for wages per capita and the unit value of exports. Finland was previously among the low unit value countries, reflecting its high share of resource-based goods. Catching up in unit value, as well as in productivity growth in real figures has also been impressive and related to high and increasing outlays for research, information and communication technology. Finland now produces and exports about 2% of European manufacturing goods. Its share of manufacturing in GDP is the second largest (26%), and in contrast to other countries, it was not lower in 1998 than in 1985.

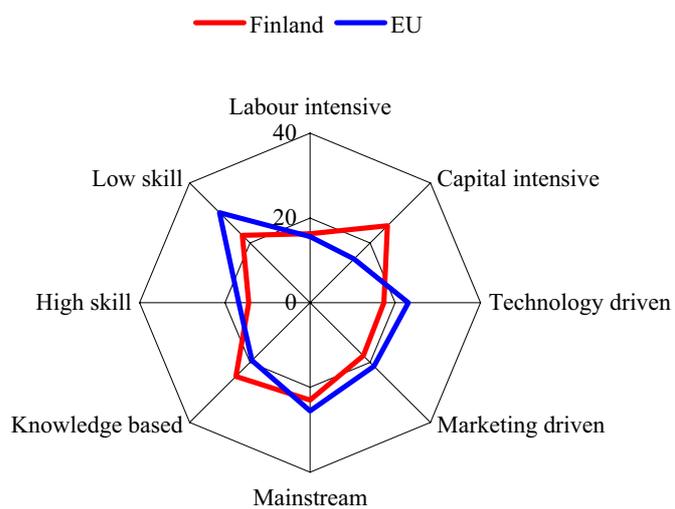
Finland maintained strongholds in resource related industries and has the highest share of capital intensive industries in 1998 (25.7%). On the other hand Finland has become one of the new leaders in information technology as shown by the second highest share in industries characterised by high inputs from knowledge based services (24.5%). Pulp and paper is still the most important sector, one third of exports are in the wood and paper sector. The “forestry cluster” is even increasing its share of value added, partly through complementary services, technology centres and headquarter functions (backward and forward integration). Radio and communication equipment jumped from rank 15 to rank 2 in production during the period of observation, with the highest increase in production as well as in export shares. Finland’s market share in European exports rose from 2.8% to 5.9%. Other increases occurred in electrical machinery and in printing and publishing, both sectors in which the old and new economy meet. Finnish industries with high market shares are ships and boats and sports goods. Given the high research intensity and the high share of information and technology-based services, it is to be expected that structural change and high growth will continue. The impact can be seen already in the increasing shares of technology driven, industries characterised by high inputs from knowledge based services and in the much lower than average share of low skill industries. The large share of capital intensive industries reflects the strongholds in resource-based industries.

Figure 9: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 10: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.  
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 10: Country profile: Finland

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	24,3	25,7	23,0	-0,4	0,2	-2,6
Labour intensive	19,3	18,8	16,3	3,2	2,2	0,7
Capital intensive	21,5	21,4	25,7	4,0	5,9	11,1
Marketing driven	25,2	23,5	17,7	4,9	3,0	-3,5
Technology driven	9,7	10,6	17,3	-11,8	-11,3	-5,7
<b>Skills</b>						
Low skills	32,0	29,0	22,5	-0,1	-2,5	-7,6
Medium skills/blue collar workers	16,9	18,2	16,7	-3,4	-3,2	-5,9
Medium skills/white collar workers	38,0	37,7	46,4	6,8	7,4	15,8
High skills	13,1	15,1	14,4	-3,2	-1,7	-2,3
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	15,5	16,1	24,5	-3,0	-2,2	5,2
Industries with high inputs from retail and advertising services	24,4	25,7	21,1	-2,4	-1,9	-7,0
Industries with high inputs from transport services	36,3	37,5	36,9	12,6	13,4	13,2
Other industries	23,9	20,7	17,5	-7,3	-9,4	-11,5

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

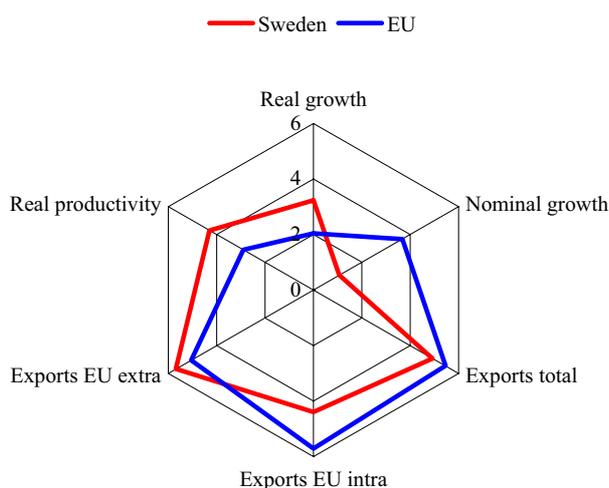
### *Towards the lead in the information society*

In **Sweden**, real growth in manufacturing is above average, as is productivity growth (in real terms). Nominal growth of value added is low, as is export growth, both due to the devaluation of the Swedish currency in 1993. Growth surged in the second half of the nineties and is now driven by new technologies, specifically in the ICT sector. Extra EU exports are growing faster than intra EU exports. The export ratio as well as openness are higher than average. The productivity level and wages are in line with the average of the member countries (taking devaluation into account), as is the unit value of exports, due to the large share of capital intensive industries. The share of technology driven industries is increasing fast, as is that of industries characterised by high inputs from knowledge-based services. Sweden has the lowest share of low skilled industries reflecting the former high wage position. Marketing driven industries have a production share, which is smaller than the European average.

Machinery and motor vehicles are the largest sectors in Sweden. Pulp and paper is placed third, and is losing production shares (in contrast to Finland). Basic metals have higher market shares in Europe than total manufacturing, both with rising trends. Radio, telecom and communication equipment is the sector with the fastest growing export share, now amounting to 15% of exports, which is as much as wood and paper together. 7% of exports was in telecom equipment in 1988 versus 22% in wood and

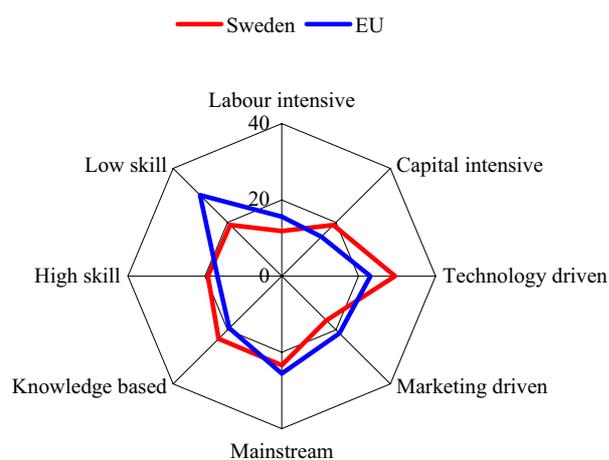
paper. Measured in comparison to Sweden's share in total European exports, the market shares of wood and paper are still higher (both around 15%) than that of telecom equipment (10%). With the full impact of Sweden's high amount of outlays for research and technology, the ICT market shares will increase further. Sweden is considered today to be one of the leading countries in information technology, even catching up with or surpassing – in certain respects – the USA.

Figure 11: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 12: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 11: Country profile: Sweden

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	26,0	26,4	23,3	1,3	0,9	-2,2
Labour intensive	14,7	15,5	11,8	-1,3	-1,0	-3,8
Capital intensive	20,5	21,2	19,0	2,9	5,7	4,4
Marketing driven	17,9	17,4	16,4	-2,4	-3,1	-4,8
Technology driven	20,9	19,5	29,5	-0,5	-2,4	6,4
<b>Skills</b>						
Low skills	25,5	25,1	19,0	-6,6	-6,4	-11,1
Medium skills/blue collar workers	24,0	23,5	26,2	3,6	2,1	3,5
Medium skills/white collar workers	33,5	33,6	35,7	2,3	3,3	5,1
High skills	17,1	17,9	19,2	0,7	1,0	2,4
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	17,3	15,4	23,3	-1,1	-2,9	4,0
Industries with high inputs from retail and advertising services	24,1	25,1	23,1	-2,7	-2,5	-4,9
Industries with high inputs from transport services	31,6	35,1	26,3	8,0	11,0	2,6
Other industries	26,9	24,5	27,3	-4,2	-5,6	-1,6

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

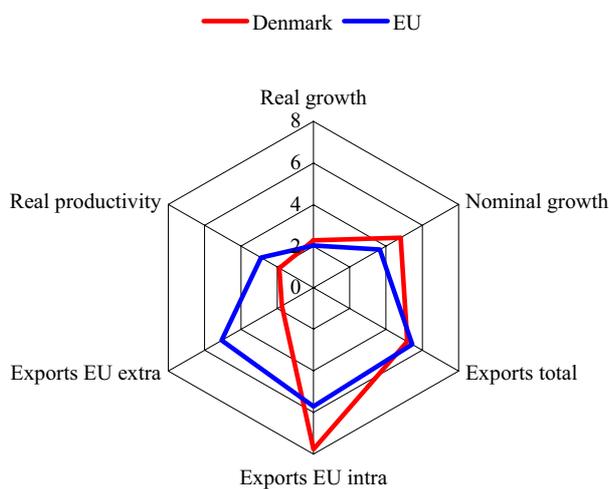
### *High income and employment by intra trade*

**Denmark** is leading in GDP per capita among European Union member countries. It is one of the three small countries with an approximate share of 1.5% of production. Its share in European manufacturing is rising slightly, reflecting above average manufacturing sector growth. Productivity is increasing rather slowly, partly as a result of the policy goal to decrease unemployment by spreading employment among more people, encouraging part time work, sabbaticals, and job sharing. Denmark thus achieved – as one of only four countries – a stabilisation of employment in manufacturing.

Denmark's industrial profile reveals a two-tier structure with an overproportionate share of industries based on low skilled inputs, as well as high shares of skilled and marketing intensive industries. The last tendency is being driven by the food sector, which supplies 19% of output and 23% of exports (3rd highest in Europe after Greece and Ireland). The second largest sector is machinery. Furthermore, Denmark is specialised in wood products and furniture. It has a rather low share in capital intensive and technology driven industries, both tendencies are contributing to below average productivity. High tech industries with relatively large export shares are pharmaceuticals and medical equipment. The fastest growing industries are wood products, tobacco and motor vehicles; the shares of other transport equipment and of the apparel industry are decreasing significantly. Summing up, Denmark is a country

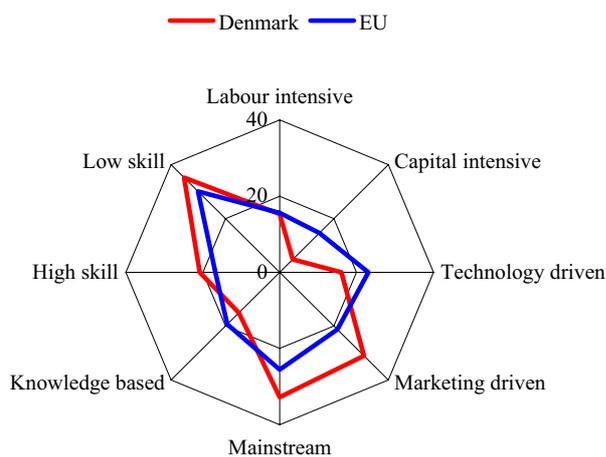
with a rather small industrial sector, and with high per capita wages. Denmark is deeply integrated in the EU, with a high and rising intra trade share. It has been successful in maintaining employment in manufacturing, partly through higher growth and partly at the expense of higher productivity.

Figure 13: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 14: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 12: Country profile: Denmark

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	31,0	33,6	32,8	6,3	8,1	7,2
Labour intensive	15,5	14,8	15,3	-0,6	-1,8	-0,3
Capital intensive	8,0	6,0	4,8	-9,5	-9,5	-9,8
Marketing driven	31,8	30,7	31,0	11,6	10,2	9,8
Technology driven	13,6	14,9	16,1	-7,9	-7,0	-7,0
<b>Skills</b>						
Low skills	37,8	36,2	35,2	5,7	4,8	5,1
Medium skills/blue collar workers	17,9	18,6	18,9	-2,5	-2,8	-3,7
Medium skills/white collar workers	24,7	23,9	25,1	-6,5	-6,4	-5,4
High skills	19,6	21,2	20,8	3,3	4,4	4,0
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	19,2	15,4	15,0	0,7	-2,8	-4,3
Industries with high inputs from retail and advertising services	26,4	30,8	33,0	-0,4	3,2	4,9
Industries with high inputs from transport services	20,1	20,8	22,1	-3,5	-3,3	-1,5
Other industries	34,4	33,0	29,9	3,2	2,9	0,9

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

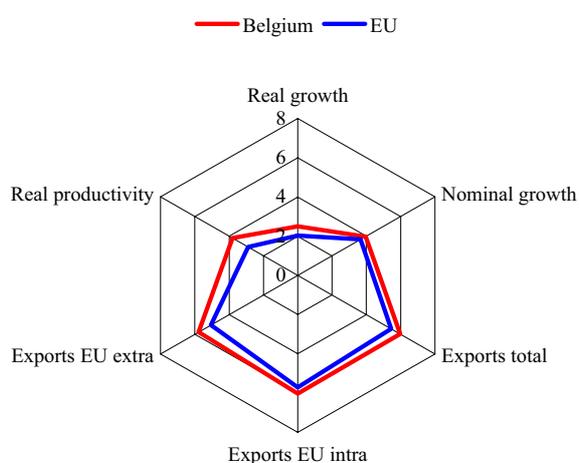
### *Productivity guarantees price competition*

**Belgium** supplies 3.6% of European value added in manufacturing and 8.2% of total exports, both with slightly rising trends. Growth is above average in nominal and real terms. Productivity is increasing fast, making value added per employee in Belgium second highest among member countries. Its industrial structure is rather traditional in the sense that specifically capital intensive and low skill industries have an unusually high share. Belgium maintained its high share in textile sectors, with textiles proper even increasing its share. Capital intensive industries located in Belgium are steel, cement and several chemical industries. The chemical sector provides 17% of value added (constant over time) and is the largest industrial sector in Belgium. Within this sector, basic chemicals are decreasing their share. Exports in pharmaceuticals are booming and the market share in Europe has increased from 6.3% to 9.6% in the observed period. Food is the second largest sector, vehicles the third.

Traditional industries achieve their high shares at the expense of technology driven and skill intensive industries. Significant inroads in technology driven industries can be observed in the production of audio and video apparatus. Publishing and printing is a marketing driven industry with high growth in Belgium. Machinery and electrical machinery have lower shares than in other countries and these

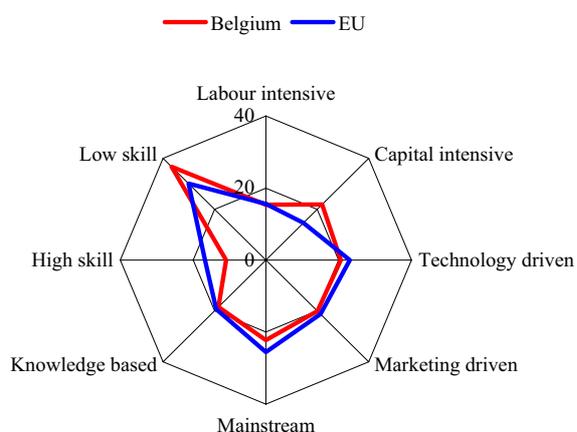
industries are losing shares. The share of skill intensive industries is low, and the unit value of exports is stagnating, which is in contrast to the high and rising productivity and the highest wage levels per employee. The lower skill input and the higher capital intensity, in addition to the high productivity, may to some extent reflect a skill drain precipitated by the well paid administrative jobs in the capital. Belgium has an open economy with the second highest export ratio and degree of openness. The importance of European integration to Belgium is reflected in the fact that the share of intra exports is high and that nevertheless intra exports still rise faster than extra exports.

Figure 15: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 16: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.  
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 13: Country profile: Belgium

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	22,9	22,7	22,2	-1,8	-2,8	-3,4
Labour intensive	14,2	16,4	15,4	-1,9	-0,2	-0,3
Capital intensive	25,4	20,5	21,9	7,9	5,0	7,3
Marketing driven	20,5	21,1	20,1	0,2	0,5	-1,1
Technology driven	17,1	19,4	20,5	-4,4	-2,5	-2,5
<b>Skills</b>						
Low skills	40,2	38,2	36,6	8,1	6,8	6,5
Medium skills/blue collar workers	17,2	21,1	21,7	-3,2	-0,3	-0,9
Medium skills/white collar workers	30,7	29,1	30,8	-0,5	-1,2	0,2
High skills	11,9	11,6	10,9	-4,4	-5,3	-5,8
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	15,2	13,8	18,4	-3,3	-4,5	-0,9
Industries with high inputs from retail and advertising services	27,5	26,9	23,5	0,7	-0,7	-4,5
Industries with high inputs from transport services	29,6	31,6	30,2	6,0	7,5	6,6
Other industries	27,8	27,8	27,8	-3,4	-2,3	-1,1

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

### *Consumer goods, investment goods and services compensate losses in steel*

**Luxembourg** is the smallest member country, growth of manufacturing is about average, and growth of GDP is higher than EU average. Luxembourg has a traditional stronghold in basic metals, but the share of this formerly dominant sector is declining. Specifically, the steel industry now produces 13% of total value added, down from 41% in 1985. Rubber and plastic products are the second strongest sector, with a rather constant share of about 14%. Fabricated metals and chemicals are growing with annual rates of just below or slightly above 10%. The machinery industry is the most important engineering industry, several food industries and printing are increasing their shares, broadening Luxembourg's industrial base and contributing to a – slightly above average – annual growth of 4.0% in nominal terms respectively 2.1% in real terms. Its overall share in European manufacturing has increased slightly, reaching 0.2% in 1998. Employment in manufacturing is 34.000, down from 38.000 in 1998. The annual decline of 0.9% is as in EU average. 8000 jobs lost in the steel industry were partially compensated by increases in the chemical industry, metal products, food and miscellaneous consumer and investment industries.

*An open economy in transition from resources to knowledge*

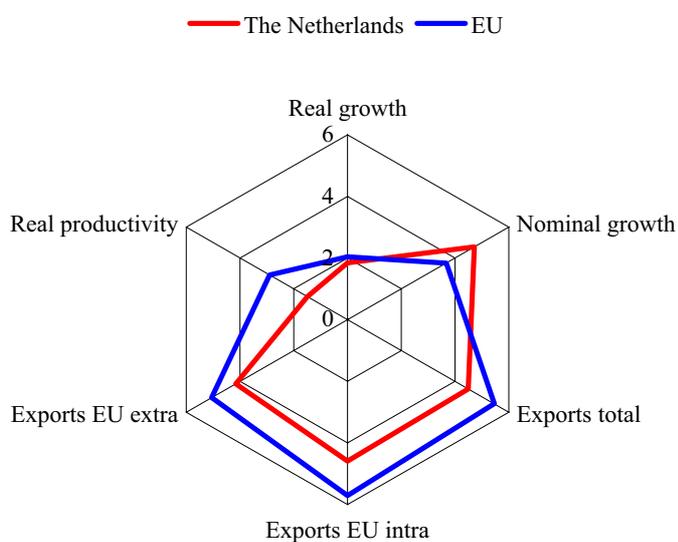
**The Netherlands** have a share of manufacturing in GDP somewhat below the EU average; growth performance is slightly higher, so that the market share in nominal production is increasing (from 3.2% to 3.8% for production). Exports, however, are growing less than European exports, starting from a very high export ratio. The Netherlands is the most open economy in the EU, with combined export plus import shares amounting to 170% of total production<sup>6</sup>. Low skill and capital intensive industries are somewhat larger than on average, so is the share of marketing driven industries. Technology driven industries have a lower share, as do skill intensive industries, while industries characterised by high inputs from knowledge-based services have a higher share.

The largest sectors are chemicals and food. Both contribute a 16% share of value added. Their share in exports and their market share in European exports is however decreasing. Three fifths of production in chemicals is basic chemicals, pharmaceuticals account for 20%. Food from the Netherlands contribute to 14% of total European exports, although the market share is declining. The publishing industry is in third place and is raising its share in value added. The tobacco industry accounts for the highest market share in EU exports - for which the Netherlands provides one third of European exports - and the petroleum industry with one fifth. Capital intensive industries with high shares are bricks and non-ferrous metals. Among the marketing driven industries, the Netherlands is specialised in games and toys, and bicycles and motorcycles. Audio and video apparatus, computers and medical equipment are high tech industries with high export shares.

---

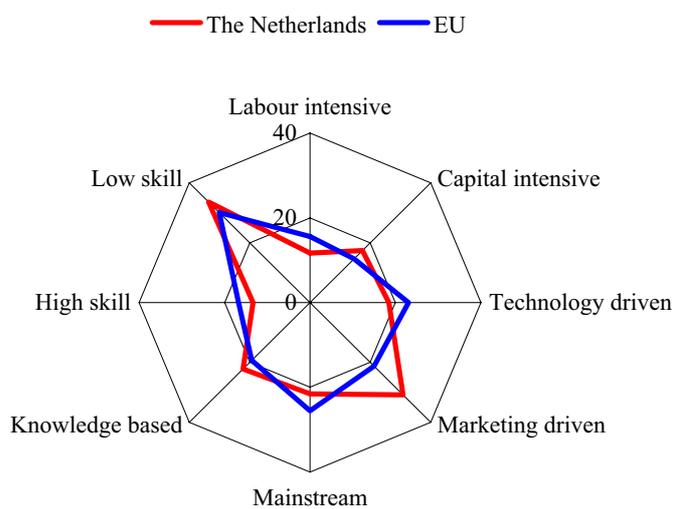
<sup>6</sup> Note however that the volume of the imports and exports could be overestimated, since the Netherlands are an important hub for trade ("Rotterdam effect").

Figure 17: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 18: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.  
 Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 14: Country profile: Netherlands

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	19,8	20,9	21,6	-4,8	-4,6	-4,0
Labour intensive	12,0	12,0	11,7	-4,1	-4,6	-3,9
Capital intensive	23,6	21,6	17,4	6,0	6,1	2,8
Marketing driven	26,5	27,9	30,8	6,3	7,3	9,6
Technology driven	18,1	17,5	18,5	-3,4	-4,4	-4,5
<b>Skills</b>						
Low skills	31,6	32,5	33,5	-0,4	1,0	3,4
Medium skills/blue collar workers	13,2	14,5	15,9	-7,1	-6,9	-6,7
Medium skills/white collar workers	44,3	42,0	37,2	13,1	11,7	6,6
High skills	10,9	11,0	13,4	-5,5	-5,8	-3,4
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	26,1	25,1	22,1	7,6	6,9	2,8
Industries with high inputs from retail and advertising services	21,3	22,6	28,2	-5,5	-5,0	0,2
Industries with high inputs from transport services	23,1	24,8	23,6	-0,5	0,7	0,0
Other industries	29,5	27,5	26,0	-1,6	-2,6	-2,9

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

### *Technology, knowledge and logistics for European projects*

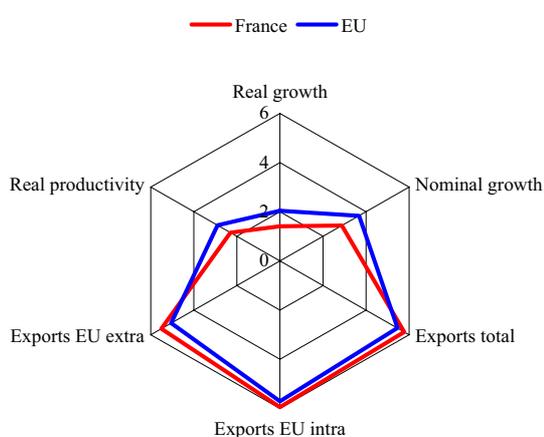
**France** has the third largest market share in production (14% of EU value added) and the second largest in exports. Manufacturing is growing - as in most large countries - by less than the EU average (1.4% p.a. in real terms, 3% in nominal figures). The share of manufacturing in total production declined to 18.5%, and now ranks 12<sup>th</sup> in relative size among members. Export growth is somewhat more dynamic than that of EU partners. The share and the dynamics of intra trade, the export ratio, and openness are all about average. The trade deficit of 1985 has been turned into a small surplus. The unit value of exports is fourth highest, productivity and per capita wages are near to the European average.

In general the industrial structure of France is very similar to that of total European industry<sup>7</sup>. However, the share of technology driven industries is higher for France, as is the share of industries characterised by high inputs from knowledge-based services, while mainstream industries have a lower share. France has strongholds in large industries, in the two largest – chemicals and food - it is expanding further; motor vehicles and machinery are the third and fourth largest sectors. Cars and other transport are leading in exports, together supplying more than one quarter of total exports. The greatest market shares are achieved in food and electrical machinery. The specific success of France in

<sup>7</sup> The sum of the (absolute) differences of the sectors between France and total EU (last column table 8) is 19, the sum for Germany is 35, for the United Kingdom 28.

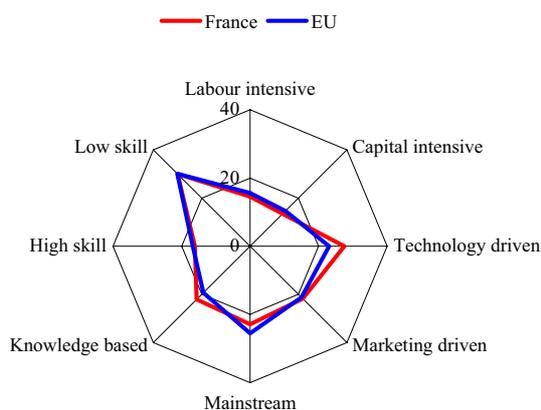
aircraft and spacecraft is reflected in the sector "other transport": 18% of value added and 45% of total European exports are reported as coming from France, reflecting trans-European projects in space and aircraft. Aircraft and spacecraft is the single largest industry: the production share of France in Europe is 18%, the export market share nearly 45%. The difference indicates the leading role of France as headquarter, project leader or as an export hub. Ships and boats, watches and clocks, luggage and handbags, and beverages and dairy products are industries in which France supplies more than one fifth of total European exports. In chemicals, the strongholds are pesticides and other agricultural products and perfumes.

Figure 19: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 20: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 15: Country profile: France

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	21,4	22,2	22,9	-3,3	-3,3	-2,7
Labour intensive	14,6	14,6	14,5	-1,5	-2,0	-1,1
Capital intensive	16,1	15,2	13,4	-1,4	-0,3	-1,2
Marketing driven	20,0	21,1	21,7	-0,2	0,6	0,5
Technology driven	27,9	27,0	27,5	6,4	5,1	4,4
<b>Skills</b>						
Low skills	31,3	31,3	29,9	-0,8	-0,2	-0,2
Medium skills/blue collar workers	20,2	22,0	22,0	-0,2	0,6	-0,7
Medium skills/white collar workers	31,1	30,3	32,1	-0,1	0,0	1,5
High skills	17,4	16,4	16,1	1,0	-0,4	-0,7
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	21,8	20,4	22,1	3,3	2,1	2,8
Industries with high inputs from retail and advertising services	23,8	25,1	26,5	-2,9	-2,6	-1,5
Industries with high inputs from transport services	21,6	23,2	23,0	-2,1	-0,9	-0,7
Other industries	32,8	31,4	28,4	1,7	1,4	-0,6

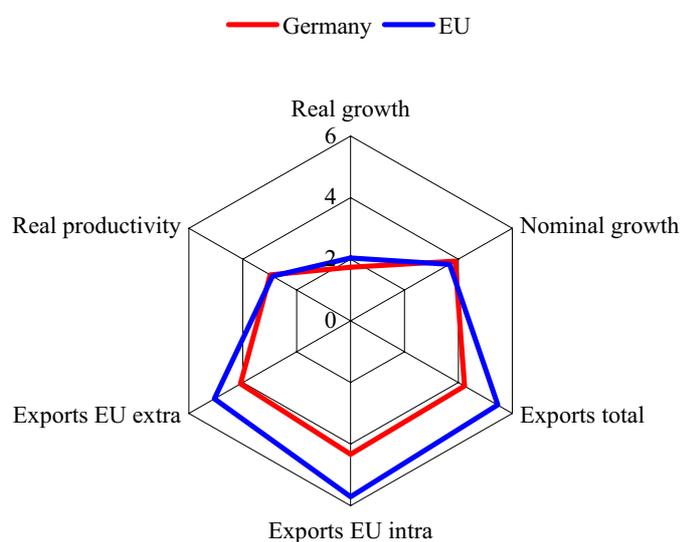
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

### *Quality based export champion*

**Germany** produces 30.4% of the value added of European manufacturing. In relation to GDP, the share of manufacturing has decreased from 30% to 24%; Germany is now only third with respect to the relative share of manufacturing in GDP, behind Ireland and Finland. Growth is less than average in real terms, productivity growth and nominal growth of value added are about average over the entire period. However, Germany's share in European manufacturing increased slightly up to 1991, then it dropped significantly up to 1994 (under the combined influence of a high currency, sluggish European business conditions and the impact of restructuring in the New Provinces). Since then, German manufacturing has been catching up in growth to a certain extent. Export dynamics are below average, the export ratio and openness of the economy is below average due to the large domestic market. The trade balance has a large surplus, amounting to more than three fourths of the EU trade surplus, and has increased by 30% between 1988 and 1998. Germany's export share in European exports declined from 28.7% to 24.6%. The extra share is large due to exports to Central and Eastern European countries. Value added per employee is 10% higher than the EU average (rank 6), wages per capita are 20% higher (rank 3), imposing pressure on costs and pushing quality up. The unit value of exports is the third highest (behind Ireland and UK) and is enjoying the second highest rate of growth, reflecting Germany's potential and competitiveness in high quality segments.

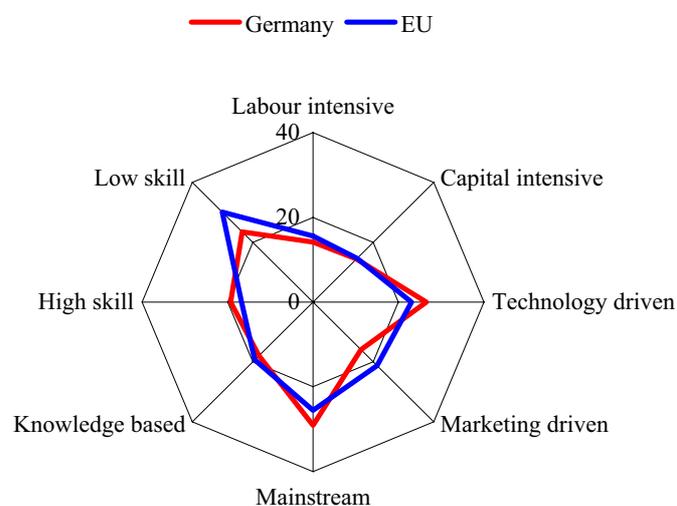
Germany's real strength is in skill intensive and mainstream industries. The share of low skill industries is 10%, the smallest among member countries, the share of exports in the highest price segment is 62%, second only to Ireland (Aiginger, 2000). The share of marketing driven industries is low due to a smaller food sector and the printing and publishing sector, which is growing, although at a slower rate than in other countries. The largest sectors in production and exports are machinery, vehicles and chemicals; together these three sectors provide 40% of value added and 50% of exports, exhibiting the unique specialisation of exports and production in Germany. In these sectors, German market shares in Europe are high, but have been decreasing over the last decade. Nevertheless, 36% of car exports and 33% of machinery are produced in Germany. Stable or even increasing market shares are seen in sectors where market shares are smaller than for total manufacturing: in paper and wood products, petroleum and other exports. In some of the technology driven industries, Germany's export market shares are below average and declining, with the strongest decline in the telecom industries. Technology driven industries with increasing market shares are aircraft and spacecraft, instruments and electronic components. The highest degree of specialisation is given – apart from motor vehicles - for machine tools, electrical apparatus, and measuring and musical instruments. In general, Germany is extremely well positioned in skill intensive mainstream industries; firms are pursuing a strategy of increasing quality, often within a given industry structure.

Figure 21: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 22: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.  
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 16: Country profile: Germany

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	27,7	29,0	29,1	3,0	3,5	3,5
Labour intensive	15,0	15,9	14,2	-1,1	-0,7	-1,5
Capital intensive	17,0	15,3	14,4	-0,5	-0,2	-0,2
Marketing driven	14,5	14,9	15,9	-5,8	-5,6	-5,3
Technology driven	25,8	25,0	26,5	4,3	3,1	3,5
<b>Skills</b>						
Low skills	24,9	24,4	23,5	-7,2	-7,1	-6,6
Medium skills/blue collar workers	23,7	24,3	26,4	3,4	2,9	3,8
Medium skills/white collar workers	32,4	31,7	30,9	1,2	1,3	0,3
High skills	19,0	19,6	19,3	2,6	2,8	2,5
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	17,8	17,6	17,9	-0,7	-0,6	-1,4
Industries with high inputs from retail and advertising services	29,5	30,6	30,4	2,7	3,0	2,4
Industries with high inputs from transport services	22,0	21,9	21,8	-1,6	-2,2	-1,9
Other industries	30,8	29,9	29,9	-0,4	-0,2	0,9

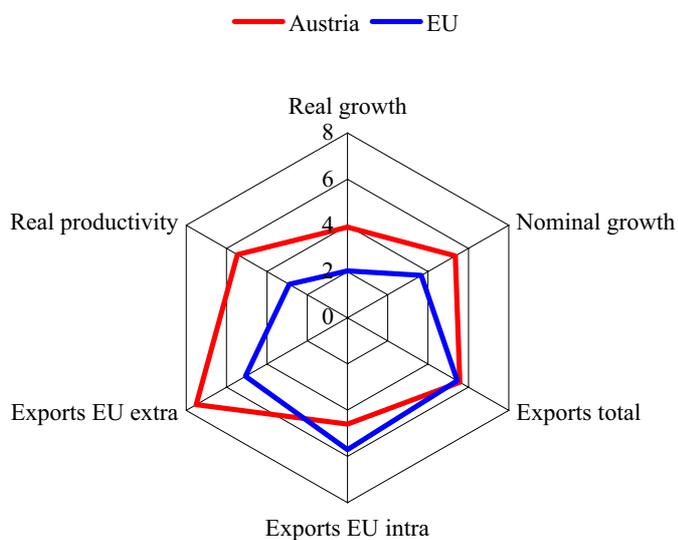
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

### *Intra sectoral quality upgrading and growth*

**Austria** has a fast growing manufacturing sector, ranked 2<sup>nd</sup> and 3<sup>rd</sup> in real and nominal growth of value added respectively. The share of manufacturing in total production is now above average (21% in 1998), although declining as in most other countries. Austria's share in European production rose from 2.2% to 2.8%. Productivity growth is specifically high, partly in the wake of privatisation and the restructuring of formerly nationalised or bank owned firms, partly due to successful medium sized firms with increasing market shares in market niches. Absolute value added per employee is now the third highest in Europe. The export ratio is high; export growth is much higher versus non-member countries. This reflects increasing trade surpluses with the accession countries in Central and Eastern Europe, but also dynamic exports to the USA. The degree of openness is high even compared to other small countries.

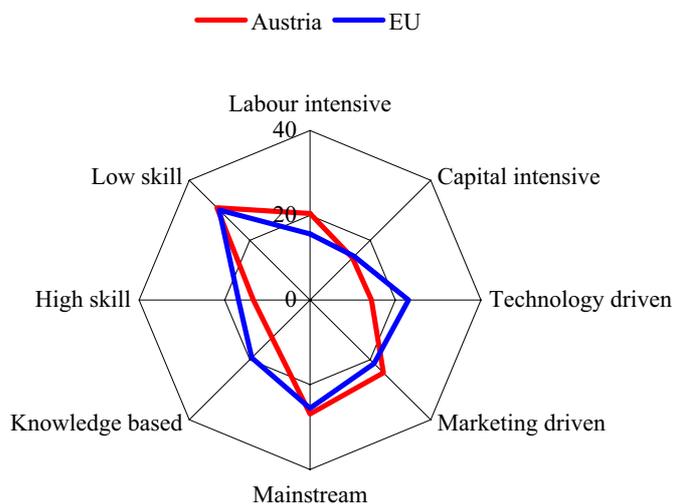
The unit values of exports are above average, but less than the unit values of imports and according to this indicator, Austria's performance is less convincing for unit values than in the productivity comparison. This stems from a certain persistence of the production structure in traditional former strongholds or, in other words, by slow *inter industry* shifts of production. However *within* industry exports are moving into higher quality segments (6<sup>th</sup> largest share in highest quality segment within industries). The share of technology driven industries is significantly smaller than in the EU, as is the share of industries characterised by high inputs from knowledge-based services and that of high skill industries. The share of labour intensive and of mainstream industries is larger. The absolutely largest sector is machinery. The highest increase in exports can be seen in motor vehicles. This is now also the second largest sector in exports; Austria supplies sophisticated parts for European and US car manufacturers. Above average market shares in exports are in traditional strongholds such as the pulp and paper industry, the leather industry, metal products, and basic metals. The largest increase in the production share occurred in the publishing and printing sector, partly due to an upcoming cluster around recorded media. Industries with a market share at or above 10% of European exports are, on the one hand, sawmilling, wood boards and panels, and builders carpentry; on the other hand, railway locomotives and sports goods. In none of the technology driven industries Austria has significantly above average market shares, reflecting insufficient research outlays and headquarters. The share of industries characterised by high inputs from knowledge based services is the 2<sup>nd</sup> lowest of the member countries. This is, at the first glance, in contrast to high and rising productivity, however skilled workers, incremental innovation and within industry quality upgrading were able – for the time period investigated - to compensate for this deficit.

Figure 23: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 24: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 17: Country profile: Austria

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	23,6	24,9	26,9	-1,1	-0,6	1,4
Labour intensive	20,9	21,8	20,4	4,8	5,2	4,8
Capital intensive	20,6	17,4	14,1	3,1	1,9	-0,5
Marketing driven	24,2	24,0	24,2	4,0	3,5	3,0
Technology driven	10,7	11,9	14,4	-10,7	-10,0	-8,7
<b>Skills</b>						
Low skills	40,7	37,9	30,8	8,6	6,5	0,7
Medium skills/blue collar workers	20,0	22,1	24,9	-0,4	0,7	2,2
Medium skills/white collar workers	28,3	28,5	31,1	-2,9	-1,8	0,5
High skills	11,0	11,5	13,3	-5,4	-5,4	-3,5
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	9,4	10,4	12,6	-9,0	-7,8	-6,8
Industries with high inputs from retail and advertising services	27,3	28,0	25,6	0,5	0,4	-2,5
Industries with high inputs from transport services	29,3	29,9	32,8	5,7	5,8	9,1
Other industries	34,0	31,6	29,0	2,8	1,5	0,1

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

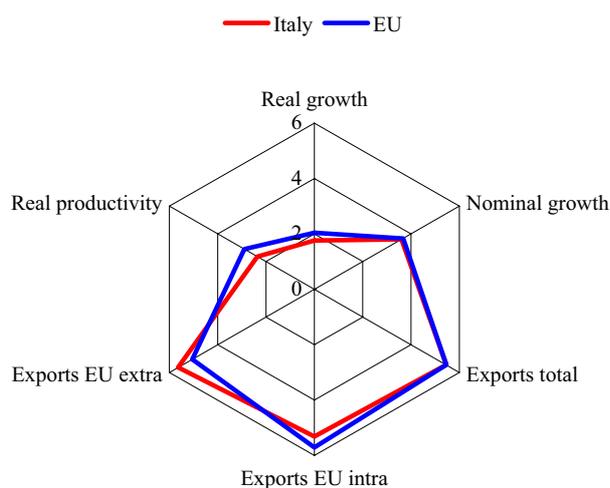
### *A two tier economy based on fashion and engineering*

**Italy** produces rather constantly 12% of European manufacturing products; real growth is below the EU average. The industrial sector amounts to 20% of GDP - somewhat below average. The export ratio and degree of openness are smaller, reflecting strong domestic demand for consumption and investment goods. Extra exports are growing strongly; trade in manufactured goods is creating a surplus. The unit value and productivity are now above average. Wages per capita are about 10% lower than the EU average and there are significant differences between the north and south.

Italy has a two-tiered industrial structure. On the one hand, the share of labour intensive and low skill industries is larger than in most other member countries; on the other hand, high skill and mainstream industries are also strong. Technology driven industries, those with high inputs from knowledge-based services, and marketing driven industries are underrepresented. Italy has a large textile sector, specifically if textiles are defined to include leather and high fashion products. The three textile sectors supply 12% of production and 17% of Italian exports. These shares are decreasing slightly as compared to total exports. Since however, in other countries this sector has contracted, or fragmented, or outsourced, Italy is now the leading export country in textiles supplying 25% of total exports. Italy is specialised in high quality, fashion products and enjoys unit values for above average in textiles,

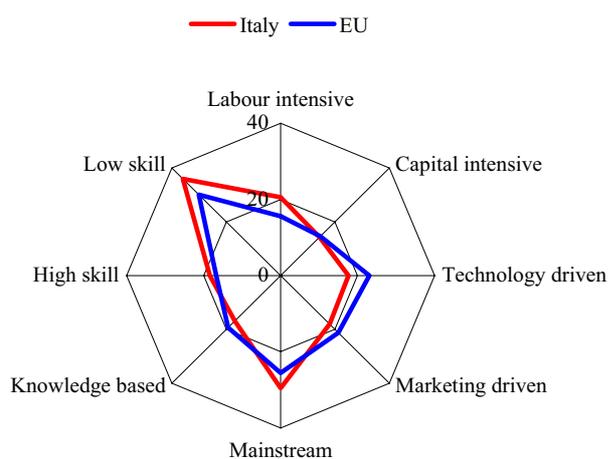
leather products and apparel. Machinery – a skill intensive, mainstream sector - is the largest single sector, followed by chemicals in production and by cars in exports. Fabricated metals is ranked 4<sup>th</sup>, cars 5<sup>th</sup> in production. On the industry level, the motor vehicles and consumer goods, such as sports goods, furniture, jewellery, domestic appliances, and pharmaceuticals, enjoy high shares in the European market.

Figure 25: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 26: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 18: Country profile: Italy

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	26,8	27,4	29,5	2,1	1,9	3,9
Labour intensive	19,3	19,6	20,6	3,2	3,0	4,9
Capital intensive	17,0	14,9	14,3	-0,5	-0,7	-0,3
Marketing driven	19,1	18,9	18,0	-1,1	-1,6	-3,2
Technology driven	17,8	19,3	17,6	-3,6	-2,6	-5,4
<b>Skills</b>						
Low skills	37,5	36,1	35,8	5,4	4,6	5,8
Medium skills/blue collar workers	18,0	18,5	20,6	-2,4	-2,9	-2,0
Medium skills/white collar workers	26,4	27,0	25,2	-4,8	-3,3	-5,4
High skills	18,1	18,4	18,4	1,7	1,6	1,6
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	15,3	16,9	16,9	-3,2	-1,3	-2,4
Industries with high inputs from retail and advertising services	27,3	27,4	27,1	0,6	-0,3	-1,0
Industries with high inputs from transport services	22,3	21,6	22,5	-1,3	-2,5	-1,2
Other industries	35,1	34,1	33,5	3,9	4,1	4,5

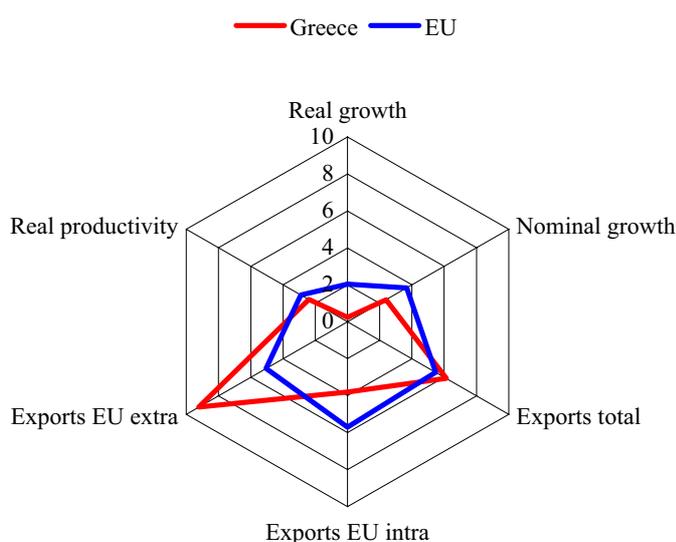
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

### *Extra EU exports stabilise production*

**Greece** is the country with the smallest share of industry in GDP. The share of manufacturing declined from 19% to 12% between 1985 and 1998, and is the lowest of all member countries. Real output increased only slightly. Greek production and exports amount to about one half of a percentage point of the EU total. In contrast to other peripheral economies Greece did not attract sufficient investments by multinational firms. Productivity and wages have been rather low, but both are catching up and have reached nearly one half of the figures for the European average. Exports are growing faster (1988 to 1998) than the European average, they have been stimulated by extra EU exports, which are growing at the second highest rate of the member countries. In contrast, intra European exports are growing more slowly than in any other member state. Extra EU exports made up 50% of total exports in 1998, singular for member countries. This reflects high and growing trade shares with Cyprus, Bulgaria, Macedonia and Turkey, but also with other Eastern European countries and Russia. Greece is the fourth most open economy as measured by the combined export and import share, and increased this openness faster than all other countries. However, trade is imbalanced, exports in manufacturing amount only to one third of imports, the trade deficit doubled between 1990 and 1999, and the industrial structure is differing ever more strongly from the EU structure. The share of low skill industries is by far the highest and is still increasing, as is the share of marketing driven industries.

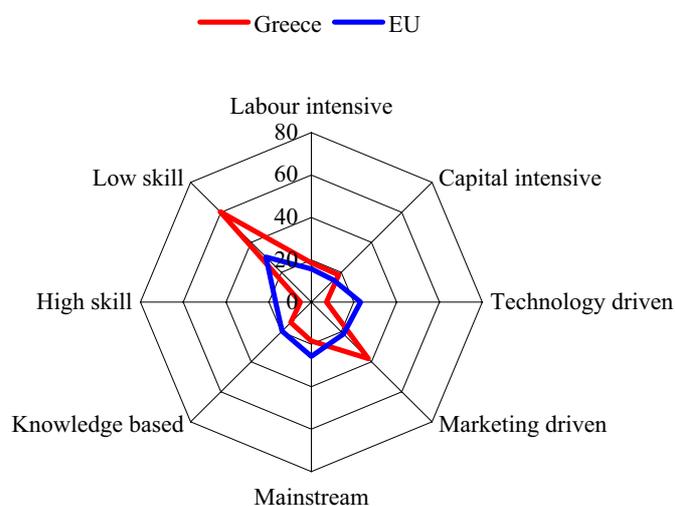
Food is the largest sector, specifically beverages. Chemicals follow second with a high share of detergents. Textiles, which in the wider sense includes leather and apparel, makes up one fourth of production as well as of exports. The share of textiles in Greek exports and production is decreasing. However, they are remaining high when compared to EU total exports, indicating relative specialisation. Apart from textiles, Greece is specialised in tobacco, boats, petroleum, cement and ferrous metals. Growing specialisation is also taking place in the printing industry, where increasing shares of Greek exports go to Cyprus, Romania, and also to the USA. In general, labour intensive, low skill, and capital intensive industries have higher production shares in Greece. The breakdown of Yugoslavia has increased transport and transaction costs with core European countries and the transformation of former socialist countries has increased competitive pressure in former strongholds of Greek industry. Normalisation in both areas and membership in the European Monetary Union will hopefully help to decrease the “economic distance” and foster the ongoing process of catching up in productivity.

Figure 27: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 28: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 19: Country profile: Greece

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	19,7	18,4	18,4	-5,0	-7,0	-7,2
Labour intensive	20,9	19,3	18,6	4,8	2,7	2,9
Capital intensive	24,2	22,7	18,1	6,7	7,2	3,5
Marketing driven	29,5	32,2	37,9	9,2	11,7	16,7
Technology driven	5,8	7,4	7,1	-15,7	-14,5	-16,0
<b>Skills</b>						
Low skills	46,9	55,0	60,3	14,8	23,6	30,2
Medium skills/blue collar workers	21,2	13,7	13,0	0,9	-7,7	-9,7
Medium skills/white collar workers	27,0	24,4	21,7	-4,2	-5,9	-8,8
High skills	4,9	6,9	5,1	-11,5	-10,0	-11,7
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	18,1	15,1	13,5	-0,4	-3,1	-5,8
Industries with high inputs from retail and advertising services	17,2	21,0	27,8	-9,5	-6,6	-0,2
Industries with high inputs from transport services	19,7	23,4	26,2	-3,9	-0,7	2,6
Other industries	44,9	40,5	32,5	13,8	10,5	3,5

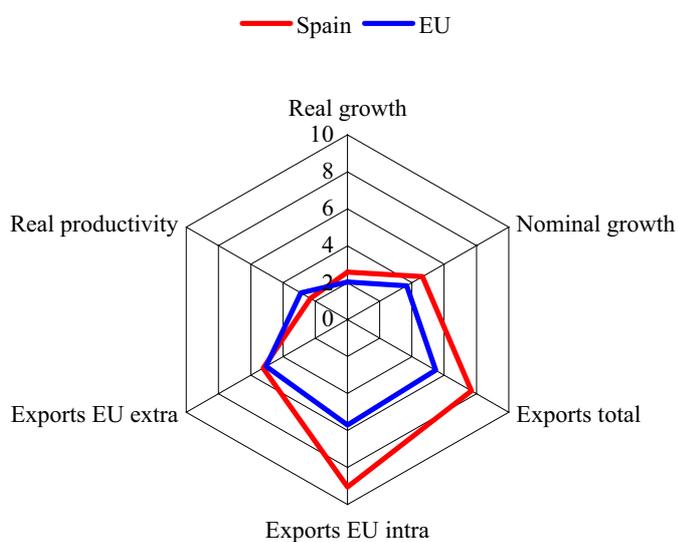
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

### *Deep integration plus cars boost growth*

Manufacturing growth in **Spain** is larger than the EU average. Spain now produces 7.2% of European manufacturing value added as compared to 6.5% in 1985. Exports are growing by 10% p.a., and are being lead by intra European exports, which exhibit the second highest growth rates. The intra EU share in exports is relatively large, openness less than average, even when compared to large countries (which traditionally rely more strongly on home markets). Exports are lower than imports; the deficit is rising, but can be compensated by Spain's strength in tourism. The share of industry in GDP is now below average. Productivity and wages are low, the unit value of exports increased more strongly than the European average. Labour intensive industries, low skill industries and marketing driven industries have a larger share of production than the EU. Industries characterised by high inputs from knowledge-based services, technology driven industries and high skill industries are underrepresented.

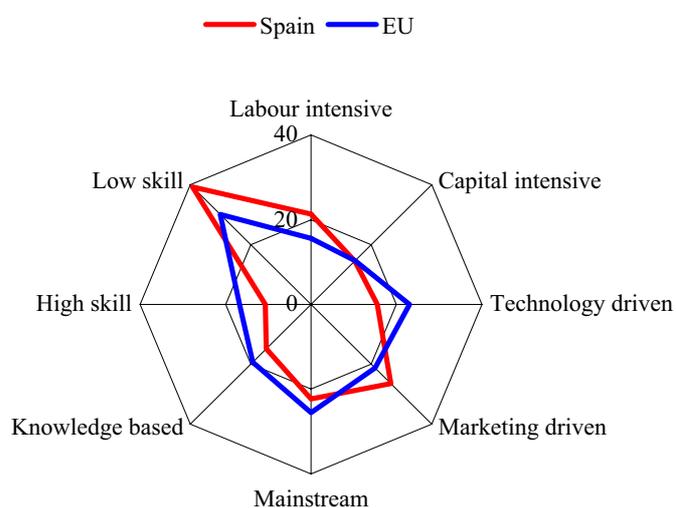
Food is the largest sector in production and the second largest in exports; fish, fruits and vegetables have double digit market shares in European exports. Chemicals had been second largest, and are now third in production and exports. Specifically, the pharmaceutical industry is the fifth largest industry in production and 10<sup>th</sup> in exports among 99 industries. Metal industries, minerals and textiles are traditionally strong sectors, with declining shares in production. However, they are exhibiting stable or increasing market shares in total European exports. The car industry doubled its share in production and is now the second largest sector in production, climbing from 5.3% to 9.5%. It is the strongest export sector, responsible for more than one fourth of exports. 10% of European car exports come from Spain. Two car industries (motor vehicles and parts) and three basic goods industries (chemicals, petroleum products, and basic steel) share the top five ranks in exports. Railway and locomotives is another industry gaining market shares. Looking at the structure according to skill types, low skill industries are still overrepresented, but so are labour intensive and marketing driven industries. The high shares of pharmaceutical industries, audio and video apparatus and medical equipment reflect successful clusters of high tech industries, often plants owned by multinational firms which are supplying leading technologies. Spain is an economy on the periphery, enjoying strong and increasing ties with the other EU countries. It is successfully catching up, partly thanks to investments by the subsidiaries of multinational firms, which are helping to restructure the economy and foster catching up.

Figure 29: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 30: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 20: Country profile: Spain

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	21,6	21,2	22,3	-3,1	-4,3	-3,3
Labour intensive	20,4	21,2	21,3	4,3	4,6	5,7
Capital intensive	19,2	15,9	14,4	1,6	0,4	-0,2
Marketing driven	26,9	26,4	26,5	6,7	5,9	5,3
Technology driven	12,0	15,3	15,5	-9,4	-6,6	-7,5
<b>Skills</b>						
Low skills	45,0	41,6	39,3	13,0	10,1	9,2
Medium skills/blue collar workers	20,6	23,6	26,2	0,2	2,2	3,5
Medium skills/white collar workers	25,0	25,1	23,9	-6,2	-5,2	-6,7
High skills	9,4	9,7	10,7	-7,0	-7,1	-6,0
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	14,0	15,9	14,8	-4,5	-2,4	-4,5
Industries with high inputs from retail and advertising services	27,6	25,9	26,8	0,8	-1,7	-1,3
Industries with high inputs from transport services	27,7	27,2	27,2	4,0	3,1	3,5
Other industries	30,8	31,0	31,2	-0,4	1,0	2,2

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

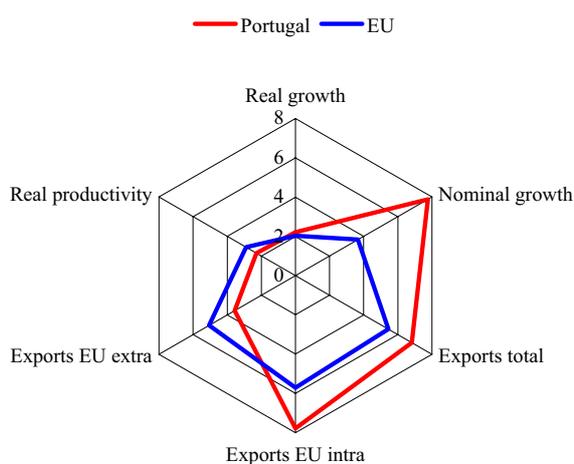
### *Europe based catching up process*

Relative to GDP, **Portugal** has a large industrial sector. It amounts to 23% of GDP of the Portuguese economy, and is growing faster, specifically in nominal terms. In real terms manufacturing declined in the first half of the nineties after a steep increase from 1985 to 1990. Portugal's production share in the EU rose from 0.9% to 1.4%, and Portugal's market share of exports is 1.2%. Productivity and wages are the lowest among member countries but catching up. The EU countries are driving the development, the intra share of exports is the largest among member countries, and intra exports are growing faster than extra exports. However, the export share of production is the second lowest of the EU members, and the degree of openness is still rather low for such a small country. The traditional trade deficit doubled over the last decade and amounts nearly to half of the exports.

Food and textiles are the largest sectors. The share of the three textile sectors – textiles, apparel, leather - decreased from 24% to 19% during the observed period; nevertheless, this share is still the second largest (after Greece) of the member countries. The share of textiles in exports decreased from 40% to 30%. However, Portugal still supplies 6% of total European exports, five times its market share in total manufacturing. Mineral products have climbed to the third largest position. Cars ranked fourth in production, and are now the largest export industry (ahead of the three textile industries, if

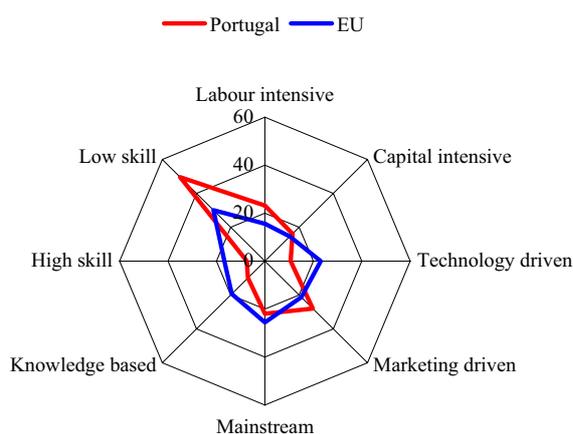
these are taken separately). Telecom equipment has gained the fifth largest export share, tobacco, wood (specifically cork), and made up textiles are industries in which Portugal has high market shares. In general, low skill and labour intensive industries still dominate, but the catching up process is under way in productivity and wages. The structure is adapting towards European demand, specifically by increasing shares of skill intensive mainstream industries. Portugal attracts foreign investments up to 3% of its GDP.

Figure 31: Country profiles: dynamics of manufacturing



Source: WIFO calculations using SBS and COMEXT.

Figure 32: Structural profile: Share of sectors in industry types



Remark: Three taxonomies as in table 5 to 7; non complete and overlapping.  
Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 21: Country profile: Portugal

	Shares in value added			Difference to EU		
	1985	1990	1998	1985	1990	1998
<b>Factor inputs</b>						
Mainstream	19,2	21,8	22,0	-5,5	-3,7	-3,6
Labour intensive	23,8	25,1	23,2	7,7	8,5	7,6
Capital intensive	21,4	15,1	16,1	3,9	-0,5	1,5
Marketing driven	28,3	28,5	28,0	8,0	7,9	6,8
Technology driven	7,2	9,6	10,7	-14,2	-12,3	-12,4
<b>Skills</b>						
Low skills	51,6	54,5	49,5	19,5	23,0	19,4
Medium skills/blue collar workers	16,9	16,6	23,3	-3,4	-4,8	0,7
Medium skills/white collar workers	26,7	22,0	19,7	-4,5	-8,3	-10,9
High skills	4,8	6,9	7,5	-11,6	-10,0	-9,2
<b>Service inputs</b>						
Industries with high inputs from information and knowledge-based services	11,2	8,2	9,9	-7,3	-10,1	-9,4
Industries with high inputs from retail and advertising services	22,2	25,5	27,3	-4,6	-2,1	-0,7
Industries with high inputs from transport services	22,6	23,3	23,3	-1,0	-0,8	-0,4
Other industries	44,1	43,0	39,5	12,9	13,0	10,5

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

Table 22: Country profile: EU

	Shares in value added		
	1985	1990	1998
<b>Factor inputs</b>			
Mainstream	24,7	25,5	25,6
Labour intensive	16,1	16,6	15,6
Capital intensive	17,5	15,5	14,6
Marketing driven	20,2	20,5	21,2
Technology driven	21,5	21,9	23,0
<b>Skills</b>			
Low skills	32,1	31,5	30,1
Medium skills/blue collar workers	20,4	21,4	22,6
Medium skills/white collar workers	31,2	30,3	30,6
High skills	16,4	16,8	16,7
<b>Service inputs</b>			
Industries with high inputs from information and knowledge-based services	18,5	18,3	19,3
Industries with high inputs from retail and advertising services	26,8	27,6	28,1
Industries with high inputs from transport services	23,6	24,1	23,7
Other industries	31,2	30,0	29,0

Source: WIFO calculations using EUROSTAT (NEW CRONOS).

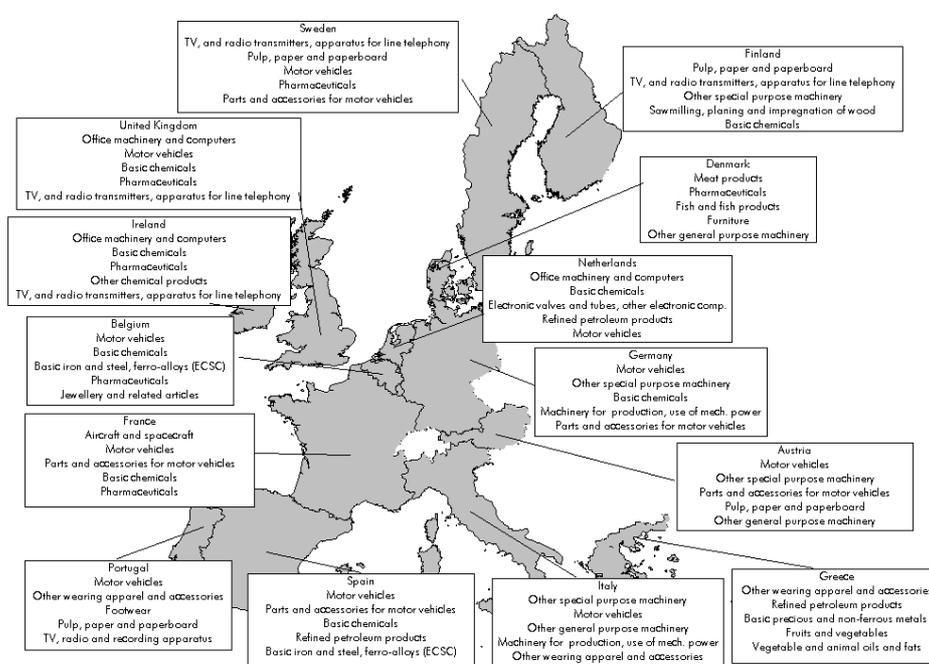
Figure 33: Specialisation of countries in sectors



Remark: Relative specialisation = large share of country in 2 digit industry relative to share of country in total exports (1999).

Source: WIFO calculations using EUROSTAT (COMEXT).

Figure 34: Specialisation of countries in industries



Remark: Absolute specialisation = large share of country in 3 digit industry of country exports (1999).

Source: WIFO calculations using EUROSTAT (COMEXT).

## References

- Aiginger, K., Trends in the specialisation of countries and the regional concentration of industries: a survey on empirical literature, WIFO Working Papers, No. 116, 1999.
- Aiginger, K., Europe's Position in Quality Competition, Background Report for Competitiveness Report 2000 (European Commission, DG Enterprise).
- Aiginger, K., Böheim, M., Gugler, K., Peneder, M., Pfaffermayr, M., Specialisation and (Geographic) Concentration of European Manufacturing, Working Paper No 1, DG Enterprise, European Commission, Brussels, 1999.
- Bonder M., Student T., Wem gehört was in Europa? Metropolitan Verlag, Düsseldorf, 2000.
- Braunerhjelm, P., Faini, R., Norman, V., Ruane, F., Seabright, P., Integration and the Regions of Europe: How the Right Policies Can Prevent Polarization, Monitoring European Integration 10, CEPR, 2000.
- Buigues P., Ilzkovitz, F., "The impact of the internal market by industrial sector: the challenge for the Member States", European Economy, European Commission 1990.
- Davies, St., Lyons B., Industrial Organisation in the EU, Oxford University Press, 1996.
- Davies, St., Rondi, L., Sembenelli, A., SEM and the changing Structure of EU Manufacturing, 1987-1993, UEA, The Economics Research Centre, Discussion Paper No. 9815, 1998.
- European Commission: The Competitiveness of European Industry, 1998, 1999, 2000. Brussels.
- Hallet, M., Regional specialisation and concentration in the EU, Economic Papers 141, European Commission, March 2000.
- Ilzkovitz, F., Dierx, A., European Integration and the location of industries: recent empirical evidence and main policy issues, European Commission DG for Economic and Financial Affairs, European Economy, 2000.
- Karsten, J., Economic Development and Industrial Concentration; an Inverted U-curve, Kiel Working Paper 770, Kiel, 1996.
- Knarvik, M.K., Overman, H., Redding, H., Venables, A., The location of European Industry, Economic Papers 142, European Commission.
- Peneder, M., Intangible Assets and the Competitiveness of European Industries, forthcoming in Buigues, P., Jacquemin, A., Marchipont, J-F. (eds.), Intangibles and Competitiveness: An Empirical Approach, Edward Elgar, UK, 2000.
- Peneder, M., Intangible Investment and Human Resources. The new WIFO Taxonomy of Manufacturing Industries, WIFO Working Papers No. 114, 1999.
- Peneder, M., Entrepreneurial Competition and Industrial Location, Edward Elgar, 2001.
- Sapir, A., Regional integration in Europe, The Economic Journal, no 102, 1992, pp 1491 –1506.
- Sapir, A., The effect of Europe's Internal Market Program on Production and Trade: A first assessment, Weltwirtschaftliches Archiv 132 (3), 1996, pp 457 – 75.
- Schulmeister, St., Die unterschiedliche Wachstumsdynamik in den USA und Deutschland in den neunziger Jahren, WIFO Working Paper No. 134, 2000.
- Wolfmayr-Schnitzer, Y., Globalisation, Integration and Specialisation of Countries: A Survey on Literature, WIFO-Working Paper, 1999.