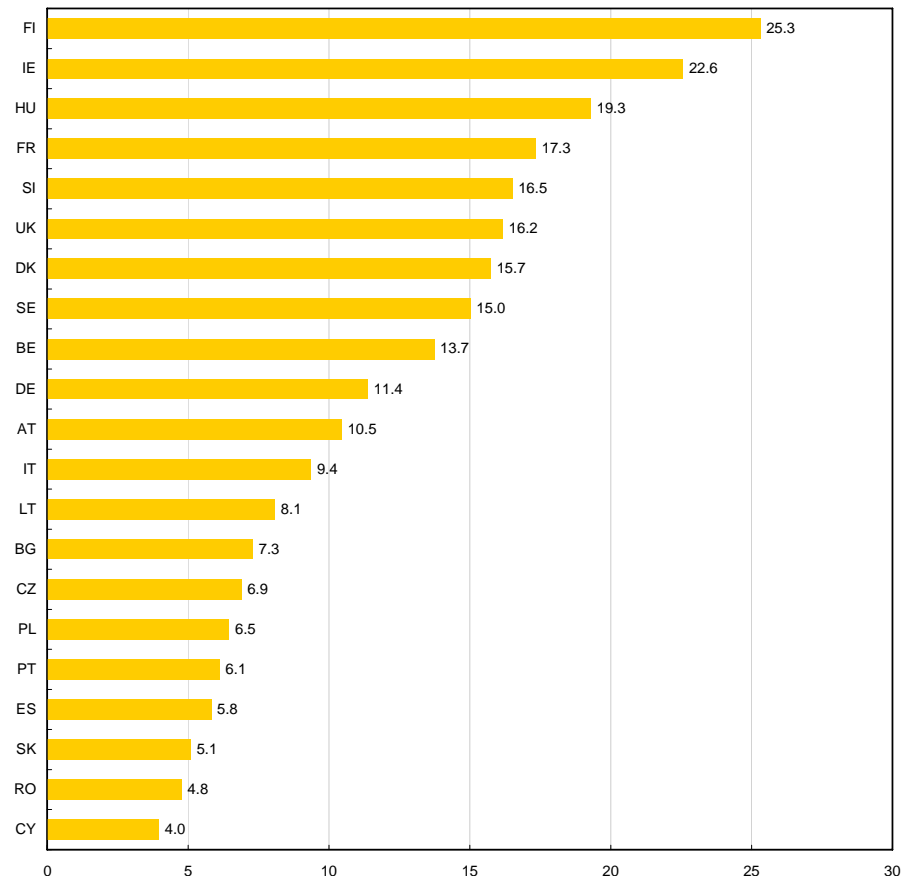


# High-tech enterprises

Most of the new Member States have to make up leeway

Figure 1: Value added of high-tech manufactures as a percentage of value added of the total manufacturing sector, EU Member States — 2003



Exceptions to the reference year: 2002: LT, PL and SE 2001: CY.

Source: Eurostat, High-tech statistics

## Main findings

- In 2003, the high-tech manufacturing sector was the best developed in Finland and in Ireland, with 25.3% and 22.6% respectively of the value added of the total manufacturing sector.
- Cyprus was the only new Member State with labour productivity in all high-tech sectors above the EU-25 average (EUR 69 000). However, in absolute terms, the high-tech sectors in Cyprus were rather small.
- The production value per enterprise in the high-tech sectors was highest in Ireland, with an average of EUR 7.9 million.
- Personnel costs per person employed in the high-tech sectors were highest in Luxembourg (EUR 54 000), closely followed by Belgium and France. However, when only remunerations are taken into account, the ranking changes: Luxembourg (EUR 48 000) is still in the lead, but followed by Denmark and the United Kingdom.
- In the high-tech sectors as a whole, Cyprus (EUR 16 500) and Portugal (EUR 13 900) led the field in terms of investments per person employed.
- The gross operating surplus was highest in Ireland, both per enterprise (EUR 2.2 million) and per person employed (EUR 101 000). Finland and Cyprus were also among the leading countries for both indicators.

## Statistics in focus

SCIENCE AND  
TECHNOLOGY

37/2007

Author

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## High-tech manufactures make a strong showing in Finland and in Ireland

The high-tech manufacturing sector, which comprises manufactures of pharmaceuticals and medicinal products, communication equipment and computers, made a strong showing in Finland and in Ireland in 2003. In fact, high-tech manufactures accounted for 25.3% and 22.6% respectively of the value added of the total manufacturing sector in these two countries.

High-tech manufactures accounted for more than 10% of the value added of the total manufacturing sector in nine other Member States, including two new Member States: Hungary (19.3%) and Slovenia (16.5%).

High-tech manufactures accounted for less than 10% of the value added of the total manufacturing sector in Italy (9.4%), Portugal (6.1%), Spain (5.8%) and most of the new Member States and candidate countries.

This reference indicator even dropped below the 5% mark in Romania (4.8%) and Cyprus (4.0%).

In 2003, EU-25 counted approximately 135 000 high-tech manufacturers and 529 000 high-tech KIS — Table 2.

High-tech manufacturers were most numerous in Italy (with over 33 000), followed by Germany (20 000), France (17 000) and Poland (15 000). In other words, Italy was the location for one quarter of European high-tech manufacturers.

However, as regards the turnover in the high-tech manufacturing sector, the ranking was quite different. France led with EUR 147 billion, followed by Germany (EUR 143 billion) and the United Kingdom (EUR 92 billion). The ranking was the same for the total production value of high-tech manufactures. For France, this is mainly due to "aircraft and spacecraft" and to a lesser extent to the firms that are active in the "pharmaceuticals, medicinal chemicals and botanical" sector.

**Table 2: High-tech sectors in the EU Member States — 2003**

	High-tech manufacturing				Total high-tech sectors (1)	High-tech knowledge-intensive services			
	Number of enterprises	Turnover in EUR million	Prod. value in EUR million	Value added in EUR million		Labour productivity in EUR thousands	Number of enterprises	Turnover in EUR million	Prod. value in EUR million
<b>EU-25</b>	<b>134 895 s</b>	:	:	:	<b>69 s</b>	<b>528 935 s</b>	<b>770 994 s</b>	<b>715 568 s</b>	<b>385 874 s</b>
<b>EU-15</b>	<b>103 259 s</b>	:	:	:	<b>73 s</b>	<b>470 564 s</b>	<b>749 769 s</b>	<b>697 871 s</b>	<b>375 923 s</b>
BE	1 887	15 020	15 554	6 279	91	13 982	22 814	22 440	11 167
CZ	8 288	: c	6 817	1 296	22	25 035	6 917	6 342	3 489
DK	1 085	9 261	9 240	4 007	78	7 802	14 285	14 170	6 931
DE	19 987	143 358	125 240	46 918	71	53 335	148 362	129 666	79 130
EE	250	: c	: c	: c	28	872	683	656	325
EL	:	:	:	:	:	:	:	:	:
ES	7 826	22 850	21 227	6 538	66	32 680	51 341	41 458	25 695
FR	16 635	147 185	135 542	35 757	71	52 920	114 626	111 805	57 194
IE	309	30 458	30 036	8 714	142	4 971	16 326	11 607	7 408
IT	33 447	59 482	57 327	18 896	65	96 738	93 386	92 220	44 801
CY	85	90	89	37	75	231	538	525	429
LV	212	: c	: c	: c	22	1 097	763	711	456
LT	363	379	384	125	16	1 348	972	897	403
LU	63	: c	: c	: c	115	1 095	2 210	1 964	1 211
HU	5 685	13 887	12 940	2 715	27	24 932	7 374	5 027	2 896
MT	:	:	:	:	49	684	314	312	230
NL	3 055	: c	: c	: c	79	22 890	40 094	38 658	20 912
AT	1 751	10 816	9 629	3 961	72	13 667	14 965	11 069	7 354
PL	15 398	7 789	7 095	2 498	19	:	:	:	:
PT	1 162	4 730	4 542	1 124	66	3 194	9 149	8 769	4 260
SI	913	2 022	1 882	908	42	2 787	1 797	1 537	807
SK	442	1 166	1 113	229	17	1 385	1 867	1 690	916
FI	1 289	28 816	17 401	7 398	92	5 155	12 453	11 722	5 142
SE	3 359	24 535	25 471	6 518	57	28 200	26 788	26 579	11 506
UK	11 404	92 178	80 451	32 958	77	133 935	182 970	175 744	93 210
BG	1 247	526	494	156	12	3 514	1 527	1 460	848
RO	1 610	922	830	327	11	9 598	3 278	3 054	1 691

EU aggregates are based only on the available country data.

Exceptions to the reference year:

2002: High-tech KIS in CY, high-tech manufactures in LT, LU, MT, PL and SE.

2001: High-tech manufactures in CY.

(1) Total high-tech sectors include high-tech manufacturing and high-tech KIS sectors. Exceptions:

High-tech KIS only: EE, LV, LU, MT and NL.

High-tech manufacturing only: PL.

Source: Eurostat, High-tech statistics

In terms of the value added generated by high-tech manufactures, Germany was well ahead with almost EUR 47 billion.

The United Kingdom had the most enterprises in the high-tech KIS sector - 134 000 of them – making up more than one quarter of the EU-25 total. It was followed by Italy, Germany and France. However, the ranking was different when it came to turnover, production value and value added: here the United Kingdom still ranked first, but was followed by Germany, France and Italy.

Labour productivity (value added per person employed) in all high-tech sectors reached EUR 69 000 in EU-25 and EUR 73 000 in EU-15 respectively. Labour productivity per person employed in the high-tech sectors as a whole was highest in Ireland with EUR 142 000 (see

methodological notes on page 7). Luxembourg was next highest with EUR 115 000.

Seven other EU-25 Member States recorded values above the EU-25 average of EUR 69 000.

The only new Member State among those seven countries was Cyprus. However, in absolute terms, the high-tech sectors in Cyprus were rather small.

In Portugal, Spain, Italy, Sweden, all the new Member States (except Cyprus) and the candidate countries, labour productivity was below the EU-25 average.

Values for Bulgaria and Romania, the two newest Member States, were at the lowest end, with EUR 12 000 and EUR 11 000 respectively.

### Production value per enterprise lagging behind the European average in many new Member States

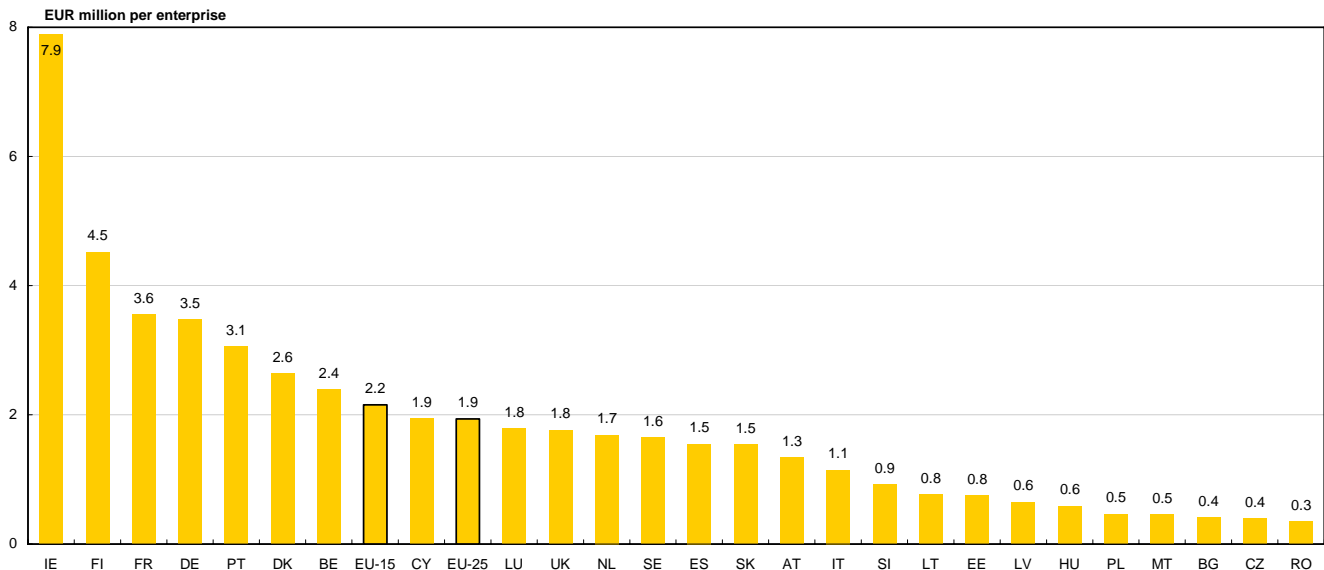
In relative terms — see Figure 3 — an average European enterprise in the high-tech sectors (high-tech manufactures and high-tech KIS) generated a production value of EUR 1.9 million.

Ireland was well in the lead with an average production value per enterprise of EUR 7.9 million (see methodological notes). Seven other Member States are listed with production values per enterprise above the EU-25 average of

EUR 1.9 million: they are Finland, France, Germany, Portugal, Denmark, Belgium and Cyprus. The United Kingdom (EUR 1.8 million), which ranked first in absolute terms (Table 2), was slightly below the European average (EUR 1.9 million).

Apart from Cyprus (EUR 1.9 million) and Slovakia (EUR 1.5 million), the production value per enterprise in the high-tech sectors was below EUR 1 million for all new Member States.

Figure 3: Production value per enterprise in EUR million, total high-tech sectors<sup>(1)</sup>, EU Member States — 2003



(<sup>1</sup>) Total high-tech sectors include high-tech manufacturing and high-tech KIS sectors.

High-tech KIS only: EE, LV, LU, MT and NL. High-tech manufacturing only: PL.

Eurostat estimates: EU-15 and EU-25.

Exceptions to the reference year:

2002: LT, LU, MT, SE and high-tech KIS in CY. 2001: High-tech manufactures in CY.

Source: Eurostat, High-tech statistics.

## Personnel costs: Gap between 'old' and new Member States

Personnel costs include remuneration (wages and salaries) and also taxes and employees' social security contributions retained by the unit, as well as the employer's compulsory and voluntary social contributions.

In 2003, the costs for a person employed in the high-tech sectors (high-tech manufactures and high-tech KIS) amounted to EUR 41 000 in EU-25 and EUR 44 000 in EU-15. Of these total costs 77% were wages and salaries.

Personnel costs were highest in Luxembourg, with EUR 54 000 per person employed. Luxembourg was closely followed by Belgium, France, Denmark and Sweden.

Ireland, which ranked first in terms of labour productivity (Table 2), was just above the EU-25 average (EUR 41 000).

Though labour productivity in France was slightly higher than the EU-25 average, in terms of personnel costs France was in the top three.

Personnel costs were also higher than the EU-25 average for six other Member States. All of them were EU-15 Member States.

Among the EU-15 Member States, only Spain, Italy and Portugal reported personnel costs per person employed below the EU-25 average (EUR 41 000). These ranged between EUR 30 000 and EUR 33 000.

By contrast, the personnel costs per person employed of all new Member States were below the EU-25 average and even under the EUR 30 000 threshold.

Two newest Member States, Romania and Bulgaria, were again at the bottom end of the scale. In these countries, personnel costs in high-tech sectors did not reach EUR 5 000 per person employed.

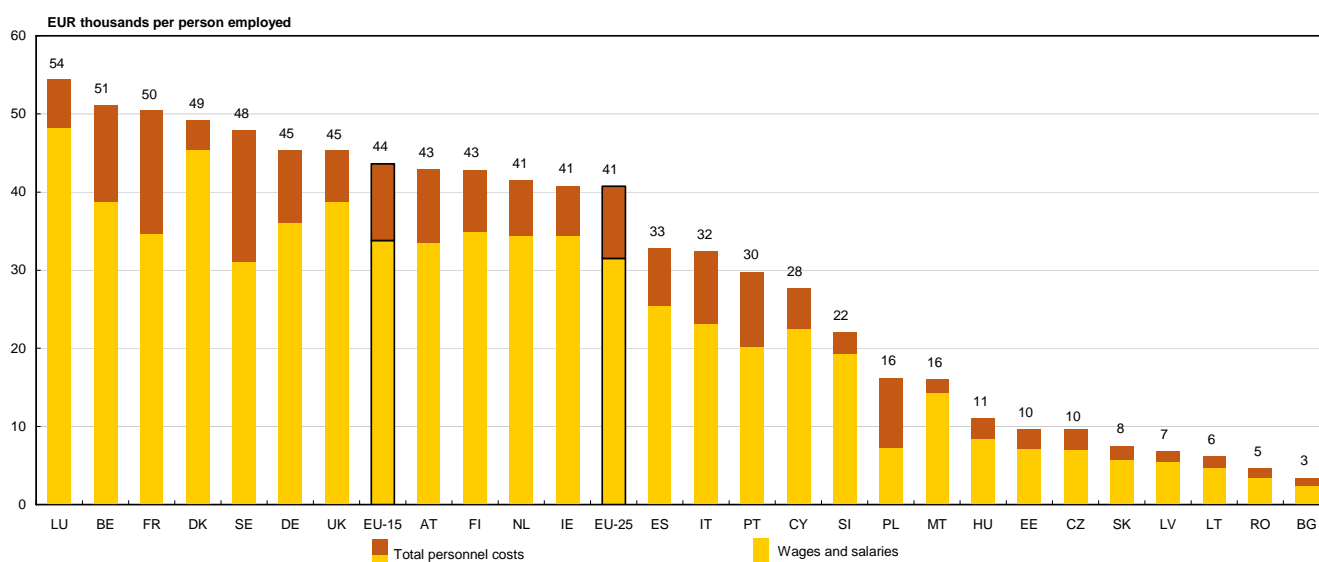
If considered separately, personnel costs per person employed were higher in high-tech manufacturing than in high-tech KIS in the majority of countries. The EU-25 averages amounted to EUR 43 000 and EUR 40 000 respectively for high-tech manufacturing and high-tech KIS.

Remuneration (wages and salaries) as a share of total costs varied from country to country. Although, this proportion reached 77% at EU-25 level, it was over 85% in Denmark, Malta, Slovenia and the United Kingdom. By contrast, in Poland less than half (45%) of the total personnel costs were in fact remunerations.

When only remunerations for the high-tech sectors are taken into account, Luxembourg still led with EUR 48 000 per person employed, but was followed by Denmark (EUR 45 000) and the United Kingdom (EUR 39 000).

Belgium and France, ranking respectively second and third in terms of total personnel costs, only came fourth and sixth when remunerations alone are taken into account.

**Figure 4: Total personnel costs and proportion of wages and salaries, in EUR thousands per person employed, total high-tech sectors<sup>(1)</sup>, EU Member States — 2003**



<sup>(1)</sup> Total high-tech sectors include high-tech manufacturing and high-tech KIS sectors. High-tech KIS only: EE, LV, LU, MT and NL. High-tech manufacturing only: PL. Eurostat estimates: EU-15 and EU-25.

Exceptions to the reference year: 2002: LT, LU, MT, SE and high-tech KIS in CY. 2001: High-tech manufactures in CY.

Source: Eurostat, High-tech statistics

## Gross investments: will the high-tech sectors expand in Portugal?

Table 5 shows gross investments in the high-tech sectors per person employed in 2003.

EU-25's total high-tech sectors (high-tech manufactures and high-tech KIS) invested EUR 8 800 in tangible goods per person employed.

Gross investment in tangible goods of high-tech manufacturing amounted to EUR 7 300, of which EUR 5 900 was invested in machinery and equipment. In high-tech KIS, gross investment in tangible goods amounted to EUR 9 600 per person employed in EU-25.

In the high-tech sectors as a whole, Cyprus (EUR 16 500) and Portugal (EUR 13 900) were leading. In Cyprus this was mainly due to the contribution of investments in high-tech KIS, in particular in the post and telecommunications sector.

The highest investments in high-tech manufacturing sector per person employed were recorded in Ireland, with EUR 14 600. It was followed by Austria and Slovenia, with EUR 10 900 and EUR 10 000 invested respectively.

Gross investments in tangible goods were below EUR 10 000 for all other Member States and also for candidate countries.

The situation was less mixed when investments in the high-tech KIS sector were taken into account. Indeed, Cyprus (EUR 18 500) ranked first, closely followed by Portugal, Belgium and Finland. Investments were also higher than EUR 10 000 per person employed for eight other Member States, included Malta and Slovenia. However, the investments per person employed were much lower in the other new Member States.

**Table 5: Investment in high-tech sectors, in EUR thousands per person employed, EU Member States — 2003**

	High-tech manufactures		Total high-tech sectors (1)	High-tech knowledge-intensive services sector
	Gross investment in tangible goods	of which gross investment in machinery and equipment	Gross investment in tangible goods	Gross investment in tangible goods
<b>EU-25</b>	<b>7.3 s</b>	<b>5.9 s</b>	<b>8.8 s</b>	<b>9.6 s</b>
<b>EU-15</b>	<b>7.7 s</b>	<b>6.5 s</b>	<b>9.2 s</b>	<b>9.9 s</b>
BE	:	5.9	:	15.6
CZ	3.9	2.5	4.1	4.3
DK	9.2	5.8	9.9	10.2
DE	7.3	6.4	7.8	8.1
EE	: c	: c	:	5.0
EL	:	:	:	:
ES	8.9	7.3	9.8	10.1
FR	8.1	:	7.6	7.4
IE	14.6	9.4	11.4	8.3
IT	7.7	6.7	9.4	10.2
CY	5.9	3.4	16.5	18.5
LV	: c	: c	:	5.1
LT	3.5	0.6	6.4	8.2
LU	: c	: c	:	: c
HU	7.1	5.5	6.2	5.5
MT	:	:	:	14.5
NL	: c	: c	:	: c
AT	10.9	7.8	11.2	11.3
PL	2.9	:	:	:
PT	9.8	8.8	13.9	16.0
SI	10.0	6.4	10.6	11.2
SK	2.8	2.3	5.0	6.0
FI	6.1	5.5	11.5	15.1
SE	9.0	6.1	11.6	12.9
UK	7.1	5.9	10.1	11.2
BG	1.7 s	0.9 s	4.4	5.4
RO	3.1	1.9	3.9	4.1

(1) Total high-tech sectors include high-tech manufacturing and high-tech KIS sectors.

Exceptions to the reference year:

2002: LT, LU, MT, SE and high-tech KIS in CY.

2001: High-tech manufactures in CY.

Source: Eurostat, High-tech statistics

## High-tech enterprises generate larger gross operating surplus in Ireland and Finland

In 2003, the gross operating surplus of EU-25's high-tech sectors amounted to EUR 28 000 per person employed and to EUR 352 000 per enterprise.

Both per enterprise and per person employed, Ireland led and Finland was always among the top three countries. Belgium, Cyprus, Luxembourg, Portugal, the Netherlands and Spain were also among the leading countries for both indicators.

Except for Cyprus and Malta, all other new Member States were below the EU-25 average in terms of gross surplus per person employed. This was also the case for Sweden.

The ranking was fairly different when the gross surplus per enterprise was taken into account. In fact, Italy and Malta, which were above the EU-25 average in terms of gross operating surplus per

person employed, were lower than the European average in terms of gross operating surplus per enterprise.

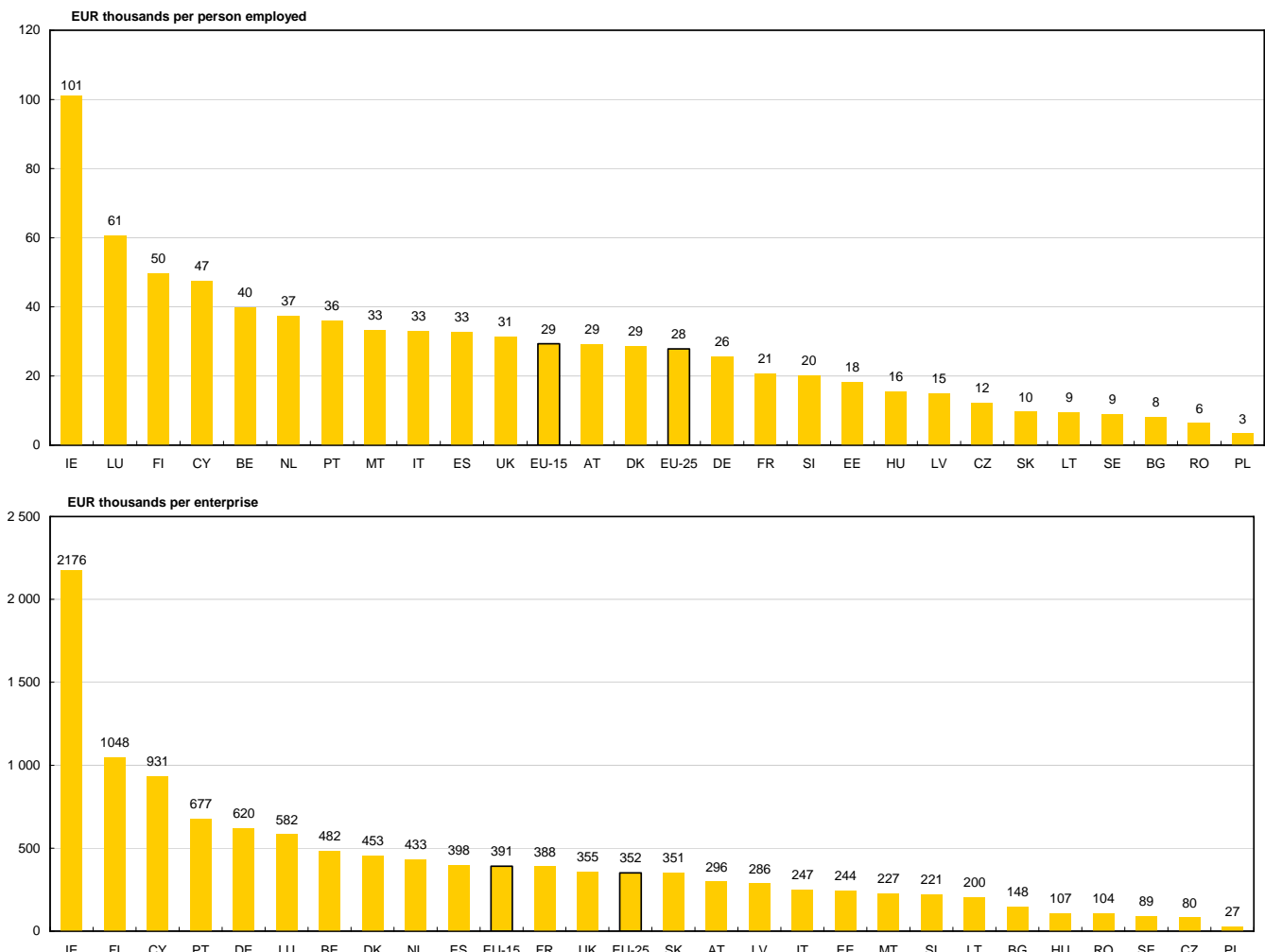
The reverse situation was seen in Germany (EUR 620 000) which ranked among the leading countries in terms of gross operating surplus per enterprise.

For both indicators, the gross operating surplus in high-tech sectors was the lowest in Poland.

In absolute terms, the highest gross operating surpluses in high-tech sectors were found in the United Kingdom, Germany and France, with EUR 52 billion, EUR 45 billion and EUR 32 billion respectively.

With the exception of the Czech Republic, the gross operating surplus of high-tech sectors did not reach EUR 1 billion in any of the new Member States.

**Figure 6: Gross operating surplus in EUR thousands per enterprise and per person employed, total high-tech sectors<sup>(1)</sup>, EU Member States — 2003**



<sup>(1)</sup> Total high-tech sectors include high-tech manufacturing and high-tech KIS sectors.

High-tech KIS only: EE, LV, LU, MT and NL. High-tech manufacturing only: PL.

Eurostat estimates: EU-15 and EU-25.

Exceptions to the reference year:

2002: LT, LU, MT, SE and high-tech KIS in CY.

2001: High-tech manufactures in CY.

Source: Eurostat, High-tech statistics

## ➤ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

### Sources

Data in this present Statistics in Focus (SIF) are based on the Structural Business Statistics (SBS). This source was used to extract information related to high-tech industries and knowledge-intensive services.

### Definitions

Data are collected within the framework of the Council Regulation on structural business statistics. This Regulation governs the transmission of data to Eurostat from the reference year 1995 onwards. In principle, it covers all market activities in sections C to K and M to O of the NACE Rev.1, but, in practice, the data available are confined to sections C to K, excluding section J (financial services). For further methodological notes, see the methodology document for "SBS" on NewCronos:

[http://europa.eu.int/estatref/info/sdds/en/sbs/sbs\\_base.htm](http://europa.eu.int/estatref/info/sdds/en/sbs/sbs_base.htm)

**Number of enterprises:** a count of the number of enterprises active during at least a part of the reference period.

**Turnover** comprises the totals invoiced by the observation unit during the reference period, and this corresponds to market sales of goods or services supplied to third parties; it includes all duties and taxes on the goods or services invoiced by the unit, with the exception of the VAT invoiced by the unit to its customer and other similar deductible taxes directly linked to turnover; it also includes all other charges (transport, packaging, etc.) passed on to the customer. Price reductions, rebates and discounts as well as the value of returned packing must be deducted.

**Production value** measures the amount actually produced by the unit, based on sales, including changes in stocks and the resale of goods and services. The production value is defined as turnover, plus or minus the changes in stocks of finished products, work in progress and goods and services purchased for resale, minus the purchases of goods and services for resale, plus capitalised production, plus other operating income (excluding subsidies). Income and expenditure classified as financial or extra-ordinary in company accounts is excluded from production value.

**Value added at factor costs** is the gross income from operating activities after adjusting for operating subsidies and indirect taxes. It can be calculated from turnover, plus capitalised production, plus other operating income, plus or minus the changes in stocks, minus the purchases of goods and services, minus other taxes on products which are linked to turnover but not deductible, minus the duties and taxes linked to production. Alternatively it can be calculated from gross operating surplus by adding personnel costs.

**Labour productivity** refers to the value added at factor costs per person employed.

**Personnel costs** are defined as the total remuneration, in cash or in kind, payable by an employer to an employee (regular and temporary employees as well as home-workers) in return for work done by the latter during the reference period. Personnel costs also include taxes and employees' social security contributions retained by the unit as well as the employer's compulsory and voluntary social contributions.

**Gross investment in tangible goods** is defined as investment during the reference period in all tangible goods. Included are new and existing tangible capital goods, whether bought from third parties or produced for own use (i.e. Capitalised production of tangible capital goods), having a useful life of more than one year including non-produced tangible goods such as land. Investments in intangible and financial assets are excluded.

**Gross investments in machinery and equipment** are the investments in all machinery and equipment goods during the reference period.

**Gross operating surplus** is the surplus generated by operating activities after the labour factor input has been recompensed. It can be calculated from the value-added at factor cost less the personnel costs. It is the balance available to the unit which allows it to recompense the providers of own funds and debt, to pay taxes and eventually to finance all or a part of its investment.

### Exception

The high values of the Irish data for value added, labour productivity, production value, etc. show the extent to which the data are influenced by foreign ownership of enterprises, outsourcing of activities and accounting practices of multinational enterprises.

### General abbreviations

KIS Knowledge-intensive services;  
s Eurostat estimate;  
: Not available.  
:c Confidential data

### Geographical coverage

EU-25 Member States and candidate countries.

### Classification of high-tech manufacturing industries

Eurostat and OECD define the following sector, based on NACE rev. 1.1 at 3-digit level, as high-tech manufacturing:

<i>High-technology manufacturing</i>	NACE Rev. 1.1 codes:
	24.4 Manufacture of pharmaceuticals, medicinal chemicals and botanical products;
	30 Manufacture of office machinery and computers;
	32 Manufacture of radio, television and communication equipment and apparatus;
	33 Manufacture of medical, precision and optical instruments, watches and clocks.
	35.3 Manufacture of aircraft and spacecraft

### Classification of high-tech knowledge-intensive services

In the same way as for manufacturing, Eurostat defines the following sector as high-tech knowledge-Intensive Services (KIS):

<i>High-technology KIS</i>	NACE Rev. 1.1 codes:
	64 Post and telecommunications;
	72 Computer and related activities;
	73 Research and development.

Data presented in this Statistics in Focus shows the data availability in Eurostat's reference database as of October 2006.

## Further information:

Data : [EUROSTAT Website/Home page/Science and technology/Data](#)

### Science and technology

#### **High-tech industry and knowledge-intensive services**

 High-tech industries and knowledge-intensive services: economic statistics at national level

 High-tech industries and knowledge-intensive services: employment statistics at national and regional level

 High-tech industries and knowledge-intensive services: science and technology statistics at national and regional level

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