5

Wood and paper

This chapter covers forest-based activities regarding the manufacture of wood and wood products (classified under NACE Division 20) and the manufacture of pulp, paper and paper products (found under NACE Division 21). The former includes all stages of wood processing that follow on from the activity of forestry, while the latter covers downstream activities that use output from the initial processing of wood. Together, these activities are referred to, hereafter, as the wood and paper manufacturing sector. It is important to underline that this sector does not include forestry, logging and related activities (NACE Division 02) that are not covered within this publication.

The multi-functional role of forests is an area of increasing global scrutiny. Wood is an important, renewable economic resource, while forests are increasingly recognised for the environmental role they play in climate regulation, biodiversity, air, soil and water quality, as well as their recreational function.

Table 5.1: Wood and wood products; pulp, paper and paper products
Top ten EU-27 enterprise (groups) in forest, paper and packaging activities, 2007 (EUR million) (1)

		World ranking	Sales
Stora Enso	FI	2	13 369
Svenska Cellulosa	SE	4	11 437
UPM	FI	6	10 031
Metsäliitto	FI	8	7 667
Smurfit Kappa	IE	10	7 270
Mondi Group	UK/South Africa	11	6 267
Sequana Capital	FR	16	4 325
DS Smith	UK	26	2 579
Cartiere Burgo	IT	29	2 381
Holmen	SE	33	2 069

(1) All figures reported for calendar year 2007, except DS Smith which is the year to 30 April 2007; data in US dollars converted to EUR, using the average exchange rate of EUR 1 = USD 1.3705 for 2007.

Source: PricewaterhouseCoopers 2008 Global Forest, Paper & Packaging Industry Survey, available at: http://www.pwcglobal.com/forestry

Building on the EU Forest Action Plan [1] for 2007 to 2011 and its 18 key actions for sustainable forest management and the improved long-term competitiveness of its associated industries, the EU has been active in pushing for international commitment to end global forest cover loss by 2030 as part of a new 'forestry package'. This package includes proposals from the European Commission that look to address some of the challenges of deforestation and forest degradation in order to tackle climate change and biodiversity loss [2], as well as laying down obligations for operators who place timber and timber products on the market [3]. These would include obliging market traders to certify that the timber and timber products they sell have been harvested according to the relevant laws of the country of origin. It is also proposed that a new global financial fund, known as the Global Forest Carbon Mechanism (GFCM), be made available to developing countries as a reward for emissions reductions achieved by taking action to reduce deforestation and forest degradation. The EU's Emissions Trading Scheme would be a major source of funding for any GFCM, whereby EUR 2.5 billion could be provided to the fund by 2020 through 5 % of auctioning revenues. Furthermore, those governments that sign-up to a global climate change deal could also be allowed to use so-called deforestation credits towards their individual CO_2 reduction commitments.

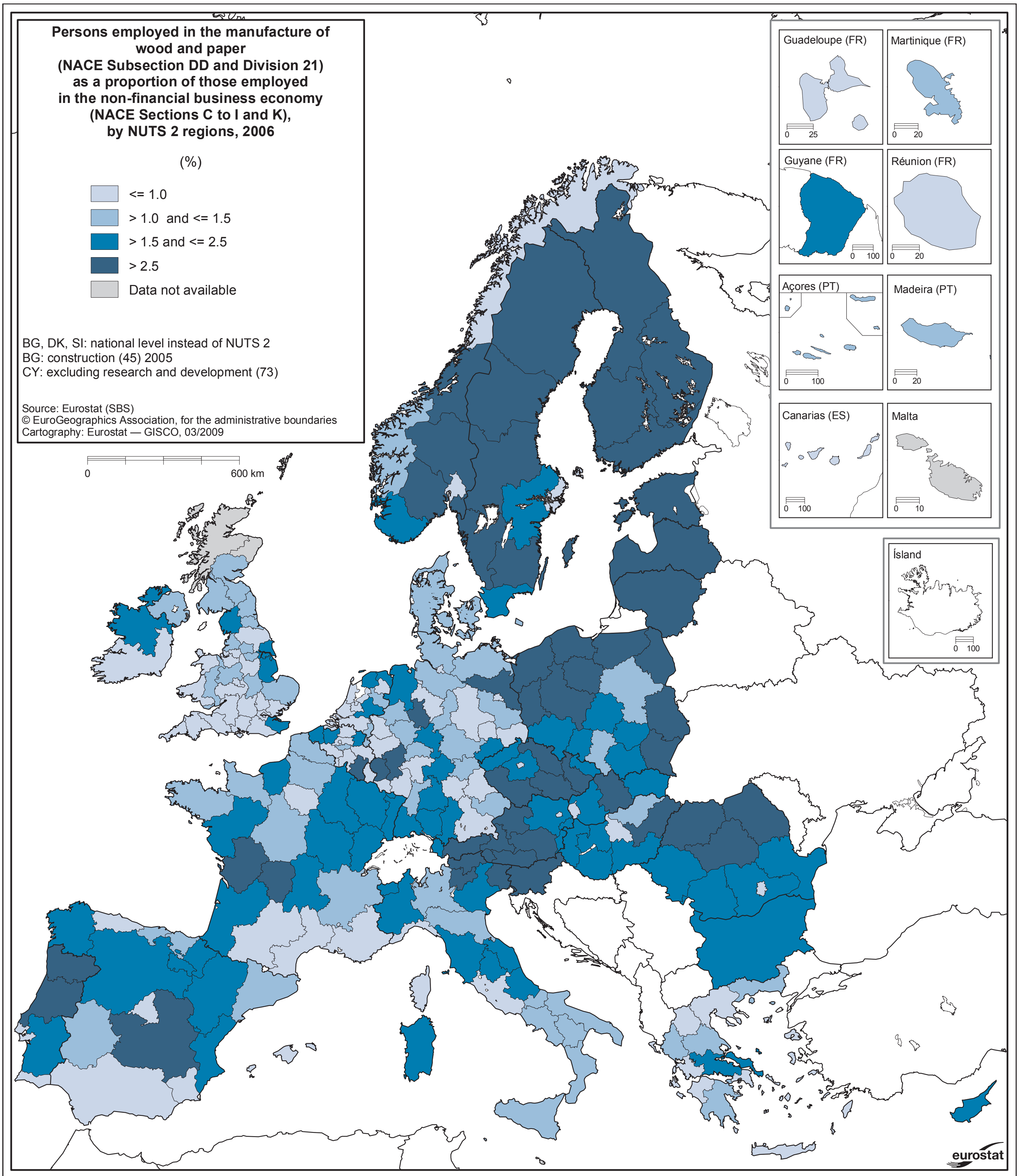
These proposals, as well as an EU Forest Action plan could have implications for the diverse wood and paper manufacturing sector in the EU. In part, this may reflect the varied size structure of enterprises within the two subsectors: the pulp, paper and paper products subsector is dominated by large, multinational enterprises, many of which are in the Nordic Member States; whereas, the wood and wood products subsector is characterised by relatively small-scale enterprises that are predominantly privately-owned and serve local or national markets.

Structural profile

The manufacture of wood and paper (NACE Divisions 20 and 21) was the main activity of 216.2 thousand enterprises across the EU-27 in 2006. These enterprises employed 2.0 million people in 2006, the equivalent of 1.5 % of the total non-financial business economy (NACE Sections C to I and K) workforce. They generated EUR 78.3 billion of value added, equivalent to a 1.4 % contribution to the added value of the non-financial business economy.

(1) COM(2006) 302.
(2) COM(2008) 645.
(3) COM(2008) 644/3.

Map 5.1: Wood and wood products; pulp, paper and paper products (NACE Subsection DD and Division 21)
Persons employed in the manufacture of wood and paper (NACE Subsection DD and Division 21) as a proportion of those employed in the non-financial business economy (NACE Sections C to I and K) (%)



Source: Eurostat (SBS)

Table 5.2: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of pulp, paper and paper products (NACE Divisions 20 and 21)
Structural profile, EU-27, 2006

	Enterprises		Turnover		Value added		Persons employed	
	(thousand)	(% of total)	(EUR million)	(% of total)	(EUR million)	(% of total)	(thousand)	(% of total)
Wood and wood products; pulp, paper and paper products	216.2	100.0	299 766	100.0	78 255	100.0	1 983.7	100.0
Wood and wood products	196.8	91.0	133 766	44.6	37 155	47.5	1 268.7	64.0
Pulp, paper and paper products (1)	19.4	9.0	166 000	55.4	41 100	52.5	715.0	36.0

(1) Rounded estimates based on non-confidential data, except for the number of enterprises.

Source: Eurostat (SBS)

Table 5.3: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of pulp, paper and paper products (NACE Divisions 20 and 21)
Structural profile: ranking of top five Member States, 2006

	Highest value added (1)			Largest number of persons employed (1)			Most specialised: share in the non-financial business economy (%) (2)	
	Country	(EUR million)	(% of EU-27)	Country	(thou-sand)	(% of EU-27)	Value added	Persons employed
1	Germany	16 338	20.9	Germany	286.8	14.5	Finland (6.3)	Latvia (5.2)
2	Italy	9 542	12.2	Italy	248.0	12.5	Estonia (4.2)	Estonia (5.0)
3	France	7 829	10.0	Poland	173.8	8.6	Latvia (4.1)	Finland (4.7)
4	United Kingdom	7 669	9.8	France	165.6	8.3	Sweden (3.7)	Lithuania (3.8)
5	Spain	6 550	8.4	United Kingdom	158.9	8.0	Austria (2.7)	Sweden (3.1)

(1) Luxembourg and Malta, not available; Cyprus, the Netherlands and Poland, 2005.
(2) Luxembourg, Malta and the Netherlands, not available; Bulgaria, Cyprus, Poland and Romania, 2005.

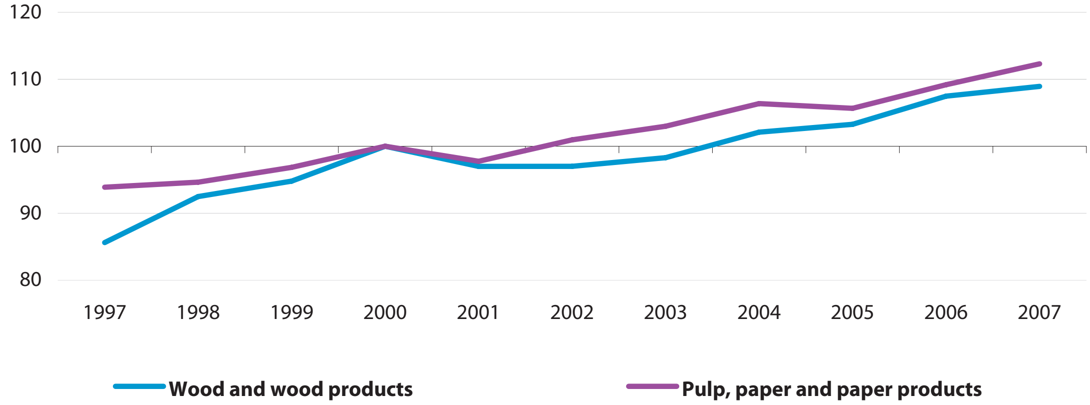
Source: Eurostat (SBS)

The manufacture of wood and wood products was much larger than the manufacture of pulp, paper and paper and paper products, in terms of both enterprise numbers (91.0 % of all enterprises manufacturing wood and paper) and employment (64.0 % of the sectoral workforce). However, it was a little smaller in terms of the value added that it generated (EUR 37.2 billion) in 2006, compared with EUR 41.1 billion for the manufacture of pulp, paper and paper products.

Wood and paper manufacturing enterprises in Italy accounted for a little over one fifth (21.2 %) of all enterprises across the EU-27, far more than in any other Member State, including Germany (6.9 %). However, it was the wood and paper manufacturing enterprises in Germany that generated by far the most value added (20.9 % of the EU-27 total in 2006), far ahead of Italy (12.2 %) and then France (10.0 %). None of these Member States were particularly specialised in wood and paper manufacturing activities, as the relative contributions of this sector to non-financial business economy value added was close to or below the EU-27 average in each of the three main producing countries. In these relative terms, Finland was by far the most specialised Member State, as the relative contribution of wood and paper manufacturing to the non-financial business economy value added was about four and a half times the EU-27 average. Estonia, Latvia and Sweden were also relatively specialised in these activities in 2006.

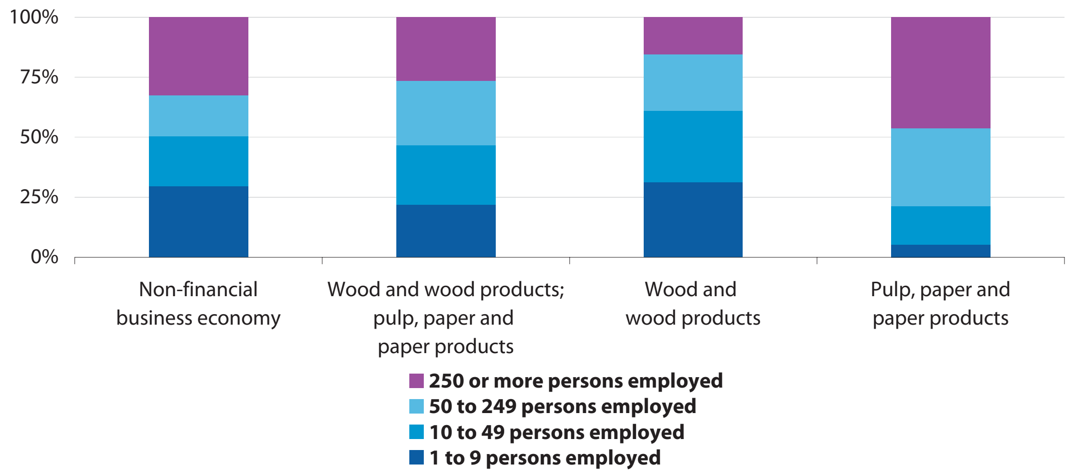
In terms of the contribution of the wood and paper manufacturing sector to employment within the non-financial business economy, the region of Detmold (Germany) was the most specialised in this activity; 9.1 % of its non-financial business economy workforce were employed in wood and paper manufacturing activities in 2006. The next most specialised regions were found in Finland and Sweden, with high degrees of specialisation also recorded in the Baltic Member States (each considered as one region at the level of detail shown in the map), as well as parts of Romania, the Czech Republic, Italy, Austria and Slovenia.

Figure 5.1: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of pulp, paper and paper products (NACE Divisions 20 and 21)
Index of production, EU-27 (2000=100)



Source: Eurostat (STS)

Figure 5.2: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of pulp, paper and paper products (NACE Divisions 20 and 21)
Share of employment by enterprise size class, EU-27, 2006



Source: Eurostat (SBS)

The evolution of EU-27 production indices for wood and wood products manufacturing on the one hand, and pulp, paper and paper products manufacturing on the other, were relatively similar in the ten years through until 2007. For both of these activities, output growth was relatively strong in the period between 1997 and 2000 (particularly in the case of wood and wood products), before a decline in production was observed in 2001. This was then followed by a relatively steady upswing (albeit with a temporary fall in the output of pulp, paper and paper products in 2005).

The growth in output over the ten year period through until 2007 averaged 1.8 % per annum for pulp, paper and paper products and 2.4 % per annum for wood and wood products, both of these rates were relatively similar to the average recorded for the whole of the industrial economy (2.1 % per annum).

There were distinct differences in enterprise size structure between the two subsectors. The pulp, paper and paper products subsector in the EU-27 was dominated by medium-sized (those employing between 50 and 249 people) and large enterprises (those employing more than 250 people); these two size classes accounted for a combined share of 78.8 % of this subsector's workforce. In contrast, micro (those employing less than 10 persons) and small enterprises (those employing 10 to 49 persons) together accounted for the majority (61.0 %) of employment within the wood and wood products subsector.

These relative differences in the size class structure between the two subsectors may, at least in part, explain some of the differences observed in productivity levels between the two activities. EU-27 apparent labour productivity was highest among large enterprises within the pulp, paper and paper products subsector (EUR 73.3 thousand per person employed) in 2006. At the other end of the range, each person employed in a micro enterprise in the wood and wood products subsector generated an average of EUR 20.0 thousand of added value.

Employment characteristics

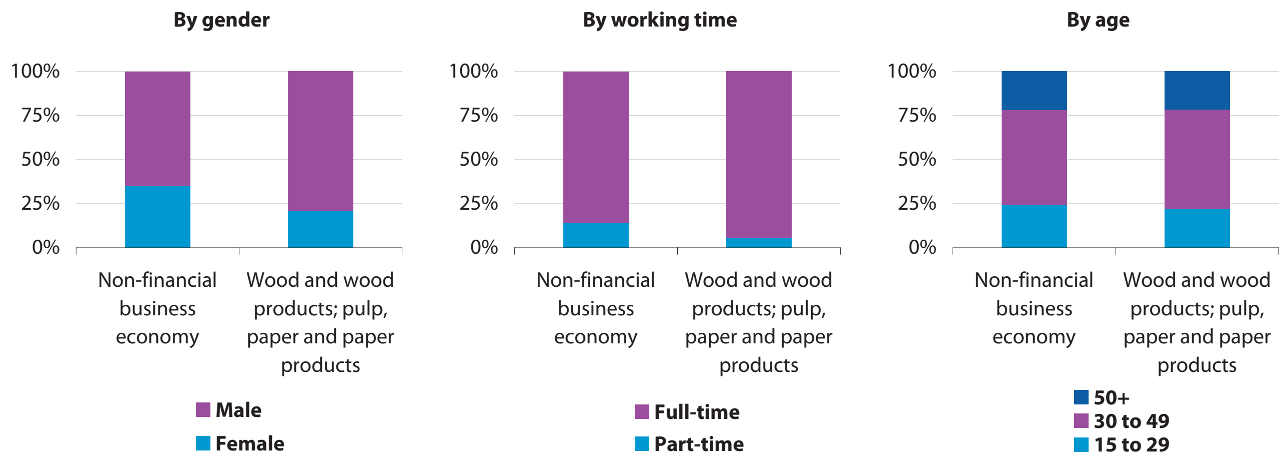
The workforce of the EU-27's wood and paper manufacturing sector displayed a particularly high propensity to employ men; in 2007, almost four fifths (79.0 %) of the workforce were men, compared with a little less than two thirds (64.9 %) across the non-financial business economy as a whole. This characteristic was common across all of the Member States for which data are available [4].

The overwhelming majority (94.6 %) of the wood and paper manufacturing workforce were engaged full-time across the EU-27 in 2007, a notably higher proportion than the non-financial business economy average (85.7 %). These working-time characteristics were common to all of the Member States with the exception of Hungary, where the proportion of part-time work (6.8 %) in wood and paper manufacturing was almost three percentage points higher than the non-financial business economy average (3.9 %).

The age profile of the EU-27's wood and paper manufacturing workforce was broadly similar to that of the non-financial business economy in 2007, albeit with a slightly lower proportion of persons under 30 years of age (22.0 % compared with 24.3 %). Among the Member States, however, the proportion of young workers in the wood and paper manufacturing sector was significantly lower than national non-financial business economy averages in Denmark (15.6 % compared with 27.1 %) and the Netherlands (19.2 % compared with 30.3 %), and to a lesser degree in France, the United Kingdom, Sweden and Cyprus.

(4) Luxembourg and Malta, not available.

Figure 5.3: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of pulp, paper and paper products (NACE Divisions 20 and 21)
Employment characteristics, 2007



Source: Eurostat (LFS)

Expenditure, productivity and profitability

The structure of operating costs in the EU-27's wood and paper manufacturing sector was similar to that observed for the whole of the non-financial business economy in 2006; the bulk (82.1 %) of operating expenditure was accounted for by purchases of goods and services.

Investment across the EU-27 in the wood and paper manufacturing sector accounted for 1.4 % of the non-financial business economy total in 2006, which was the same proportion as the relative share of wood and paper manufacturing in total value added. The relative importance of investment within wood and paper manufacturing activities was highest in Finland (6.3 % of total investment), Estonia (4.2 %) and Latvia (4.1 %), three of the Member States that were most specialised in the manufacture of wood and paper.

Investment in tangible goods covered 18.6 % of the value added that the wood and paper manufacturing sector generated in the EU-27 in 2006, a very similar proportion (18.4 %) to that noted across the whole of the non-financial business economy. Among the Member States, the investment rate for wood and paper manufacturing was particularly high in Latvia (66.3 %) and Lithuania (53.5 %); these rates were also relatively high in relation to national investment rates for the non-financial business economy (47.1 % and 39.9 %).

The apparent labour productivity of the wood and paper manufacturing sector across the EU-27 was EUR 39.4 thousand per person employed in 2007, about 10 % less than the non-financial business economy average. However, apparent labour productivity of the pulp, paper and paper products subsector was EUR 57.5 thousand per person employed, which was about double the level recorded for the wood and wood products manufacturing subsector (EUR 29.3 thousand per person employed). In all of the Member States for which information is available [5], with the notable exception of Ireland, the apparent labour productivity of the pulp, paper and paper products manufacturing subsector was higher (often considerably so) than productivity within the wood and wood products subsector.

(5) Cyprus, the Netherlands and Poland, 2005; Luxembourg and Malta, not available.

Table 5.4: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of pulp, paper and paper products (NACE Divisions 20 and 21)
Expenditure, productivity and profitability, EU-27, 2006

	(EUR million)			(EUR thousand per person)		(%)	
	Personnel costs	Purchases of goods & services	Investment in tangible goods	Apparent labour productivity	Average personnel costs	Wage adjusted labour productivity	Gross operating rate
Wood and wood products; pulp, paper and paper products	48 883	223 931	14 528	39.4	27.4	144.0	9.8
Wood and wood products	22 883	97 931	6 528	29.3	20.9	140.1	10.7
Pulp, paper and paper products (1)	26 000	126 000	8 000	57.5	37.7	152.5	9.1

(1) Rounded estimates based on non-confidential data.

Source: Eurostat (SBS)

Table 5.5: Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products (CPA Divisions 20 and 21)
External trade, EU-27, 2007

	Value (EUR million)			Share of industrial exports (%)	Share of industrial imports (%)
	Extra-EU exports	Extra-EU imports	Trade balance		
Wood and wood products, paper and paper products	30 403	24 197	6 207	2.6	1.8
Wood and wood products	9 965	12 083	-2 117	0.9	0.9
Pulp, paper and paper products	20 438	12 114	8 324	1.8	0.9

Source: Eurostat (Comext)

Average personnel costs in the EU-27's pulp, paper and paper products manufacturing subsector (EUR 37.7 thousand per employee) were also higher than those experienced across the wood and wood products manufacturing subsector (where each employee cost about 20 % less). As a result, the difference in productivity levels when measured in wage adjusted terms narrowed, with the ratio for the pulp, paper and paper products manufacturing sector (152.5 %), almost identical to the non-financial business economy average (151.1 %), while that for the wood and wood products manufacturing subsector was somewhat lower (140.1 %).

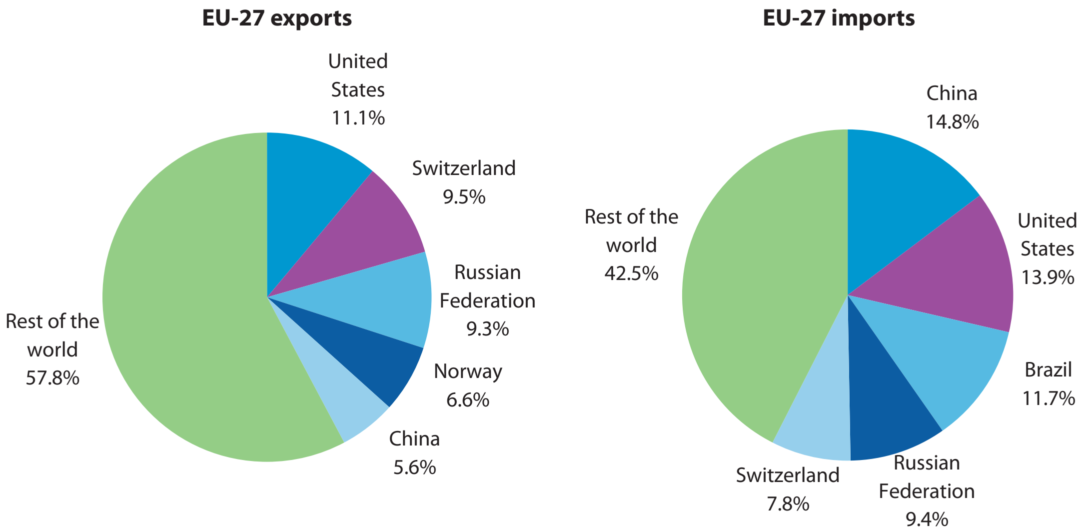
The gross operating rate (which is one measure of profitability) of the wood and paper manufacturing sector of the EU-27 was 9.8 % in 2006, a little below the corresponding rate for the non-financial business economy (10.8 %). Whilst this pattern was repeated across most of the Member States, the profitability of the wood and paper manufacturing sector was about half the non-financial business average in the United Kingdom (7.6 % compared with 14.4 %), while in Portugal it was about higher (13.3 % compared with 9.2 %). Whereas the profitability of the EU-27's pulp, paper and paper products subsector had been higher than that of the wood and wood products subsector in 2002 (12.6 % and 9.5 % respectively), the difference between these two rates subsequently narrowed and reversed, with the gap widening in 2006 (9.1 % and 10.7 % respectively).

External trade

The EU's internal market accounted for approximately three quarters (74.8 %) of the EU-27's trade in wood and paper products (CPA Divisions 20 and 21) in 2007. Trade in wood and paper products with the rest of the world, however, recorded a surplus of EUR 6.2 billion in 2007, with exports valued at EUR 30.4 billion and imports valued at EUR 24.2 billion. More specifically, the overall surplus was derived from pulp, paper and paper products (a surplus of EUR 8.3 billion) as there was a deficit (EUR 2.1 billion) for wood and wood products. The trade surplus for pulp, paper and paper products grew considerably (58.4 % overall) in the period between 2002 and 2007, during which time the trade deficit for wood and wood products also widened (from EUR 0.4 billion in 2002).

Exports of wood and paper products represented a significant share of all industrial exports in just a handful of Member States; in Finland and Latvia they represented a fifth of industrial exports in 2007, while in Estonia and Sweden they accounted for a little more than 10 % of the total, significantly more than their average share (2.6 %) across the whole of the EU-27. Finland and Sweden had the highest trade surpluses for wood and paper products in 2007 (EUR 11.2 billion and EUR 10.8 billion respectively), with surpluses also recorded in Germany (EUR 5.5 billion) and Austria (EUR 4.2 billion). In contrast, the United Kingdom had by far the largest trade deficit for wood and paper products (EUR 9.5 billion).

Figure 5.4: Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products (CPA Divisions 20 and 21)
Main trading partners, EU-27, 2007 (% share of exports/imports in value terms)



Source: Eurostat (Comext)

Although the United States remained the largest export market for EU-27 wood and paper products (accounting for an 11.1 % share of extra-EU exports) in 2007, this share was down sharply on the corresponding value for 2006 (14.2 %); the relative importance of exports to Russia and Norway grew between 2006 and 2007. Imports of wood and paper products into the EU-27 from China continued to grow, overtaking the United States for the first time in 2007, with a 14.8 % share of all EU-27 wood and paper imports. Brazil and Canada were also relatively important providers of wood and paper products to EU-27 markets; they accounted for 11.7 % and 7.1 % respectively of extra-EU imports in 2007 (significantly higher than their shares for all industrial goods, 1.9 % and 1.5 % respectively).

5.1: Wood and wood products

The wood and wood products sector is classified as NACE Division 20. It is split into five groups that cover the initial processing stages of sawing and planing of wood (NACE Group 20.1), through semi-processed wood products, such as the manufacture of boards and panels (NACE Group 20.2) and builders' carpentry and joinery (NACE Group 20.3), towards finished products such as wooden containers (NACE Group 20.4) and other wood products, including household goods made from wood (NACE Group 20.5). Note that furniture manufacturing (NACE Group 36.1), whether from wood or other materials is not covered here, but in Subchapter 13.1.

In January 2008, the European Commission released an energy and climate change package that includes a draft Directive on Renewable Energy Sources [6]. The Directive aims to achieve a 20 % mandatory share of renewable energy (including at least 10% of transport fuel consumption from biofuels, which would include timber and woodchips) in final energy consumption by 2020. This has led to some concerns about growing wood shortages and resultant price rises for the EU's wood and paper sector. The European Commission's Enterprise Directorate-General [7] hopes the EU's woodworking industries will be able to better compete in the future through the promotion of greater skills, higher levels of training, innovation, the use of new technology and better networking between small and medium-sized enterprises in order to improve supply and distribution chains.

Structural profile

There were 196.8 thousand enterprises across the EU-27 for which wood and wood products manufacturing (NACE Division 20) was their main activity. These enterprises generated EUR 37.2 billion of value added in 2006, a little under one half (47.5 %) of the total value added generated in the wood and paper manufacturing sector. They also employed just over one and a quarter million people across the EU in 2006, about two thirds (64.0 %) of the sectoral workforce.

Within the wood and wood products manufacturing sector, the largest activity at the NACE group level was the manufacture of builders' carpentry and joinery (NACE Group 20.3), which includes the manufacture of wooden goods likes beams, rafters, door, windows and parquet flooring for the construction industry; it contributed EUR 16.4 billion of value added (44.1 % of the total for wood and wood products manufacturing) and employed 579.0 thousand persons across the EU-27 (45.6 % of the wood and wood products manufacturing workforce). The second largest activity, in terms of both value added end employment was that of sawmilling, planing and the impregnation of wood (NACE Group 20.1), which is the first stage in the processing of wood; this activity generated a little less than a quarter (23.1 %) of EU-27 value added (EUR 8.6 billion) and employed about one in every four (24.2 %) persons within the wood and wood products manufacturing workforce. The remaining third (32.7 %) of value added generated across wood manufacturing, a combined EUR 12.1 billion, was generated through the manufacture of veneer sheets, plywood, laminboard, particle board, fibre board and other panels and boards (NACE Group 20.2), other products of wood (NACE Group 20.5) and wooden containers (NACE Group 20.4).

(6) COM(2008) 0019.

(7) More information at: http://ec.europa.eu/enterprise/forest_based/.

Table 5.6: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (NACE Division 20)
Structural profile, EU-27, 2006

	Enterprises (thousand)	Turnover (EUR million)	Value added (EUR million)	Persons employed (thousand)	Share in total (%)	
					Value added	Persons employed
Wood and wood products	196.8	133 766	37 155	1 268.7	100.0	100.0
Sawmilling and planing of wood, impregnation of wood (1)	34.2	36 700	8 600	307.0	23.1	24.2
Veneer sheets; plywood, laminboard, particle board, fibre board and other panels and boards (1)	2.6	24 802	5 660	125.6	15.2	9.9
Builders' carpentry and joinery (1)	114.1	49 600	16 400	579.0	44.1	45.6
Wooden containers (1)	10.0	10 569	2 830	94.1	7.6	7.4
Other products of wood; articles of cork, straw and plaiting materials (1)	36.0	12 033	3 658	162.6	9.8	12.8

(1) Rounded estimates based on non-confidential data.

Source: Eurostat (SBS)

Table 5.7: Wood and wood products (CPA Division 20)
Production of selected products, EU-27, 2007 (1)

	Prodcom code	Production value (EUR million)	Rounding base (EUR million)	Volume of sold production (million)	Unit of volume	Rounding base (million)
Builders' joinery and carpentry of wood excluding windows, french-windows and doors, their frames/thresholds, parquet panels, shuttering for concrete constructional work - shingles, shakes	20.30.13.00	9 164	-	5 043.5	kg	-
Doors and their frames and thresholds of wood	20.30.11.50	8 723	-	123.1	units	-
Windows; French-windows and their frames of wood	20.30.11.10	7 731	-	52.4	units	-
Spruce wood (Picea abies Karst.), fir wood (Abies alba Mill.)	20.10.10.35	7 586	-	43.4	m^3	-
Prefabricated buildings of wood	20.30.20.00	7 337	-	-	-	-
Particle board, of wood	20.20.13.13	6 537	-	28.0	m^3	-

(1) Excluding products of a generic nature (other), sales of services such as repair, maintenance and installation; estimates; threshold of production value set at EUR 6 billion.

Source: Eurostat (PRODCOM)

The wood and wood products manufacturing sector in Germany generated EUR 6.6 billion of value added in 2006, the largest contribution (17.7 %) to the EU-27 total. A further two fifths (43.0 %) of the value added generated across the EU-27's wood and wood products manufacturing sector came from the output of Italy, the United Kingdom, France and Spain. However, it was the Baltic Member States that were the most specialised in this activity. Indeed, in Latvia and Estonia wood and wood products manufacturing contributed almost 4 % of the value added generated across their respective non-financial business economies, which was a little more than five and a half times the average contribution made by these activities across the EU-27 as a whole.

Among the subsectors covered, the strongest rise in EU-27 output during the ten-year period through to 2007 was recorded for veneer sheets, plywood, laminboard, particle board, fibre board and other panels and boards (where growth

Table 5.8: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (NACE Division 20)
Expenditure and productivity, EU-27, 2006

	(EUR million)			(EUR thousand per person)	
	Personnel costs	Purchases of goods & services	Investment in tangible goods	Apparent labour productivity	Average personnel costs
Wood and wood products	22 883	97 931	6 528	29.3	20.9
Sawmilling and planing of wood, impregnation of wood (1)	4 800	29 000	2 150	28.0	17.1
Veneer sheets; plywood, laminboard, particle board, fibre board and other panels and boards	3 233	19 350	1 286	45.1	26.2
Builders' carpentry and joinery (1)	10 700	34 000	2 160	28.3	22.6
Wooden containers	1 882	7 717	415	30.1	22.2
Other products of wood; articles of cork, straw and plaiting materials	2 320	8 546	522	22.5	17.7

(1) Rounded estimates based on non-confidential data.

Source: Eurostat (SBS)

averaged 3.4 % per annum in the EU-27). In contrast, there was a relatively sharp decline (-3.4 % per annum between 2000 and 2007) for the production of other wood products, articles of cork, straw and plaiting materials.

Against a background of progressive increases in the output of wood and wood products within the EU-27 (averaging 2.4 % per annum during the period 1997 to 2007), there were particularly high gains recorded in Luxembourg (12.4 % per annum), Poland (8.1 % per annum), Romania (6.3 % per annum), Latvia (5.8 % per annum) and Austria (5.7 % per annum).

Expenditure and productivity

Average personnel costs in the wood and wood products sector were relatively low in the EU-27, as they averaged EUR 20.9 thousand per employee in 2006, which was 23.7 % less than for the whole of the wood and paper manufacturing sector. As a proportion of total operating expenditure, however, personnel costs in the wood and wood products sector accounted for a slightly higher share (18.9 %) than the corresponding figure for wood and paper manufacturing (17.9 %).

Average personnel costs were particularly low in the sawmilling, planing and impregnation of wood subsector (EUR 17.1 thousand per employee) and the other wood products, articles of cork, straw and plaiting materials manufacturing subsector (EUR 17.7 thousand per employee). In the case of the other wood products, articles of cork, straw and plaiting materials manufacturing subsector, personnel costs nevertheless accounted for over one fifth (21.4 %) of total operating expenditure, suggesting that this is a relatively low-wage, labour-intensive activity.

The apparent labour productivity of the wood and wood products manufacturing sector in the EU-27 was about one quarter (25.8 %) less than the average recorded for the whole of the wood and paper manufacturing sector in 2006. There was a considerable spread, however, in apparent labour productivity levels; at one extreme, the manufacture of other wood products, articles of cork, straw and plaiting materials subsector reported that each person employed generated an average of EUR 22.5 thousand of added value, which was about half the level recorded within the veneer sheets, plywood, laminboard, particle board, fibre board and other panels and boards subsector (EUR 45.1 thousand per person employed).

With both average personnel costs and apparent labour productivity about a quarter less than across the wood and paper manufacturing sector as a whole, wood and wood products manufacturing recorded a wage adjusted labour productivity ratio that was similar to that for the whole of wood and paper manufacturing (140.1 % compared with 144.0 % in 2006). Wage adjusted labour productivity ratios for both the manufacture of veneer sheets, plywood, laminboard, particle board, fibre board and other panels and boards subsector (172.0 %) and the sawmilling, planing and impregnation of wood subsector (164.0 %) were notably higher.

5.2: Pulp, paper and paper products

The pulp, paper and paper products sector is broken down in the NACE classification into two groups. The first, NACE Group 21.1, covers the manufacture of pulp, paper and paperboard, through mechanical and chemical processes. These products often require further processing, as covered by the second activity, NACE Group 21.2, which includes the manufacture of corrugated, household and sanitary paper products, as well as newsprint, wallpaper and stationery.

Pulp is the basic material for the manufacture of paper and board and can be made from woodchips (a by-product of sawmills), fresh wood, recovered paper and from some agricultural products (natural textiles or industrial crops). However, it is in the use of recycled fibres that much progress has been made: the principle is that recycling helps keep the sourcing of virgin fibres at volumes where forests can be managed sustainably, as well as keeping recoverable materials out of landfill. The European Parliament and Council Directive on packaging and packaging waste of 1994 set relatively broad recycling targets for packaging by the end of 2008. The European Commission is currently in the process of making a new set of target proposals for packaging and packaging waste, which should cover the period 2009 to 2014.

The European Declaration on Paper Recycling is an industry initiative that has set a specific target for the recycling rate at 66 % of all paper and board products consumed in Europe to be achieved by 2010. The European Recovered Paper Association (ERPA) reported that the recycling rate for 2006 had reached 63.4 % [8], with 58.2 million tonnes of paper and board having been recycled (marking an overall increase of about 10 % since 2004) in the EU-27, Switzerland and Norway. The European Recovered Paper Identification System [9] is a further industry initiative that was launched by the Confederation of European Paper Industries (CEPI) in October 2008 to promote a more consistent quality and grade of every bale of recovered paper by means of identification that will enable full traceability.

Structural profile

The pulp, paper and paper products (NACE Division 21) manufacturing sector was dominated by a relatively few number of large enterprises; there were only 19.4 thousand enterprises across the EU-27 that had pulp, paper and paper products manufacturing as their main activity in 2006, together they employed an estimated 715.0 thousand persons and generated EUR 41.1 billion of value added, which was equivalent to 52.5 % of the total value added generated across the whole of the wood and paper manufacturing sector.

(8) More information at: http://www.erpc.info.

(9) More information at: http://www.cepi.org.

Table 5.9: Manufacture of pulp, paper and paper products (NACE Division 21)
Structural profile, EU-27, 2006

	Enterprises (thousand)	Turnover (EUR million)	Value added (EUR million)	Persons employed (thousand)	Share in total (%) Value added	Share in total (%) Persons employed
Pulp, paper and paper products (1)	19.4	166 000	41 100	715.0	100.0	100.0
Pulp, paper & paperboard (1)	2.4	78 000	18 200	224.0	44.3	31.3
Pulp (2)	0.3	7 000	1 700	20.0	4.3	2.7
Paper & paperboard (3)	2.1	70 572	16 048	205.9	39.0	28.8
Articles of paper & paperboard (1)	17.0	87 692	22 865	491.5	55.6	67.8
Corrugated paper & paperboard & of containers of paper & paperboard (4)	8.3	44 000	12 000	281.5	29.2	39.4
Household & sanitary goods & of toilet requisites	1.4	22 318	4 737	78.5	11.5	11.0
Paper stationery	3.1	8 192	2 040	52.5	5.0	7.3
Wallpaper (5)	0.1	1 113	:	6.0	:	0.8
Other articles of paper & paperboard n.e.c.	4.0	12 084	3 768	75.6	9.2	10.6

(1) Rounded estimates based on non-confidential data. (2) Turnover, value added and number of persons employed, rounded estimates based on non-confidential data, 2005. (3) Number of enterprises, 2005. (4) Number of persons employed, 2005. (5) Turnover, 2005.

Source: Eurostat (SBS)

Table 5.10: Manufacture of pulp, paper and paper products (NACE Division 21)
Structural profile: ranking of top five Member States in terms of value added and persons employed, 2006

	Highest value added (1)			Largest number of persons employed (1)			Most specialised: share in non-financial business economy (%) (2)	
	Country	(EUR million)	(% of EU-27)	Country	(thou-sand)	(% of EU-27)	Country	Value added
1	Germany	9 744	23.7	Germany	143.6	20.1	Finland	4.3
2	Italy	4 305	10.5	Italy	78.9	11.0	Sweden	2.3
3	France	4 136	10.1	France	78.5	11.0	Slovakia	1.2
4	United Kingdom	3 788	9.2	United Kingdom	73.5	10.3	Austria	1.2
5	Sweden	3 669	8.9	Spain	55.2	7.7	Portugal	1.1

(1) Luxembourg and Malta, not available; the Netherlands and Poland, 2005.
(2) Luxembourg, Malta and the Netherlands, not available; Bulgaria, Cyprus, Poland and Romania, 2005.

Source: Eurostat (SBS)

Table 5.11: Pulp, paper and paper products (CPA Division 21)
Production of selected products, EU-27, 2007 (1)

	Prodcom code	Production value (EUR million)	Rounding base (EUR million)	Volume of sold production (million)	Unit of volume	Rounding base (million)
Cartons; boxes and cases of corrugated paper or paperboard	21.21.13.00	20 442	-	21 158	kg	-
Folding cartons; boxes and cases of non-corrugated paper or paperboard	21.21.14.00	12 120	-	6 963	kg	-
Envelopes of paper or paperboard	21.23.12.30	6 000	600	679	kg	-
Coated paper, for writing, printing, graphic purposes (excluding coated base, weight ≤ 150 g/m²)	21.12.53.37	5 898	-	7 956	kg	-
Newsprint in rolls or sheets	21.12.11.50	5 454	-	10 393	kg	-
Toilet paper	21.22.11.10	5 432	-	3 572	kg	-
Graphic paper, paperboard: mechanical fibres ≤ 10 %, weight ≥ 40 g/m² but ≤ 150 g/m², sheets	21.12.14.39	5 140	-	5 959	kg	-

(1) Excluding products of a generic nature (other), sales of services such as repair, maintenance and installation; estimates; threshold of production value set at EUR 5 billion; the rounding base indicates the magnitude of the rounding employed to protect confidential cells (in the case of PRODCOM code 21.23.12.30, the value lies within the range +/- EUR 600 million of the reported value).

Source: Eurostat (PRODCOM)

The manufacturing of articles of paper and paperboard (NACE Group 21.2) subsector was larger than the manufacturing of pulp, paper and paperboard (NACE Group 21.1) subsector, both in terms of value added generated (55.6 % of the pulp, paper and paperboard total) and, more particularly, of employment (68.7 %). The manufacture of corrugated paper and paperboard and of containers of paper and paperboard (NACE Class 21.21) was the main activity among those covered by the manufacture of articles of paper and paperboard, accounting for more than 50 % of its value added and employment. The manufacture of paper and paperboard (NACE Class 21.12) was the principal activity among those within the pulp, paper and paperboard (NACE Group 21.1) manufacturing subsector, accounting for the overwhelming share of value added and employment.

The value added generated by the pulp, paper and paper products manufacturing sector in Germany was EUR 9.7 billion in 2006, which equated to 23.7 % of the EU-27's value added. This was more than twice the contribution made by Italy or France, the next largest Member States within this activity. However, in terms of the relative contribution made by pulp, paper and paper products to the overall value added of the non-financial business economy, it was Sweden and Finland that were by far the most specialised producers; the sector contributed 2.3 % of Swedish value added in the non-financial business economy, which was three times as high as the EU-27 average, while in Finland its share of non-financial business economy value added rose to 4.3 %, which was six times as high as the EU-27 average.

Between 1997 and 2007, there were upward trends in EU-27 output of pulp, paper and paper board (with production rising by an average of 2.1 % per annum) and articles of paper and paper board (1.5 % per annum). At a more detailed level, there was a relatively uniform and upward evolution (growth of 2.5 % per annum on average) for the manufacture of household and sanitary goods and of toilet requisites (NACE Class 21.22), which contrasted sharply with a relatively unchanged evolution of output observed for paper stationery (-0.2 % per annum).

Expenditure and profitability

Personnel costs in the pulp, paper and paper products manufacturing sector accounted for 17.1 % of total operating expenditure across the EU-27 in 2006, a slightly lower proportion than for the whole of the wood and paper manufacturing sector (17.9 %). Average personnel costs in the pulp, paper and paper products manufacturing sector, however, were relatively high at EUR 37.7 thousand per employee in 2006. This was particularly the case with respect to the pulp, paper and paperboard subsector, where average personnel costs were EUR 46.1 thousand per employee, while personnel costs accounted for a relatively low share of operating expenditure (14.2 %), suggesting a relatively high-wage, but capital-intensive manufacturing activity.

The apparent labour productivity of the EU-27's pulp, paper and paper products manufacturing sector was EUR 57.5 thousand per person employed in 2006. In more detail, the apparent labour productivity of the pulp, paper and paperboard subsector reached EUR 81.3 thousand per person employed in 2006, which was well above that registered for the articles of paper and paperboard subsector (EUR 47.6 thousand per person employed). Even when taking into account the differences in wages, the productivity of the subsectors remained wide apart; as the wage adjusted labour productivity ratio for the pulp, paper and paperboard subsector was 176.2 % in 2006, compared with 138.9 % for the articles of paper and paperboard subsector.

Among the Member States, the highest wage adjusted labour productivity ratios for the pulp, paper and paper products manufacturing sector were recorded by Slovakia (282.1 %), Poland (278.7 % in 2005) and Portugal (264.2 %).

Table 5.12: Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (NACE Division 20)
Main indicators, 2006 (1)

	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT
Enterprises	1.7	2.0	28.9	0.6	13.2	1.1	0.3	6.0	16.2	10.9	41.6	0.9	1.7	4.5
Persons employed	13.8	20.0	73.4	15.0	143.2	19.4	7.0	14.5	103.3	87.1	169.0	3.1	32.1	33.1
Turnover	3 526	373	3 330	2 182	23 583	1 135	1 257	770	11 298	13 715	18 051	187	1 371	810
Production	3 480	339	3 077	2 174	22 437	1 116	1 200	750	10 640	12 280	17 561	186	1 322	782
Purch. of goods & serv.	2 660	310	2 678	1 477	16 881	876	851	557	8 284	9 927	13 116	120	1 100	616
Value added	905	82	824	799	6 594	275	376	257	3 194	3 693	5 237	74	333	214
Personnel costs	465	35	416	587	4 253	156	230	169	2 112	2 759	2 736	51	151	135
Average personnel costs	38.1	1.9	8.6	39.6	32.7	8.2	33.7	19.8	22.8	32.8	24.7	20.2	4.7	4.6
Gross operating surplus	441	47	408	211	2 341	119	145	88	1 082	935	2 501	23	182	80
Gross investment	126	36	135	108	967	89	35	50	507	541	926	13	224	121
Apparent labour prod.	65.4	4.1	11.2	53.1	46.0	14.2	53.8	17.7	30.9	42.4	31.0	23.8	10.3	6.5
Wage adj. labour prod.	172.0	218.2	131.3	134.0	140.9	173.8	159.6	89.8	135.4	129.1	125.2	117.4	218.3	142.1
Gross operating rate	12.5	12.7	12.3	9.7	9.9	10.5	11.6	11.4	9.6	6.8	13.9	12.2	13.2	9.9
Investment rate	13.9	44.1	16.4	13.5	14.7	32.4	9.3	19.6	15.9	14.6	17.7	16.9	67.3	56.2
	LU	**HU**	**MT**	**NL**	**AT**	**PL**	**PT**	**RO**	**SI**	**SK**	**FI**	**SE**	**UK**	**NO**
Enterprises	0.0	4.7	:	2.0	3.5	18.4	9.3	7.4	1.7	0.8	2.5	6.9	8.4	2.0
Persons employed	0.6	27.0	:	19.3	38.6	130.9	46.6	80.7	12.1	14.7	28.4	42.5	85.4	16.0
Turnover	181	1 031	:	2 850	7 130	5 222	3 661	1 945	718	711	7 593	9 362	11 029	3 332
Production	178	843	:	2 726	6 942	4 994	3 339	1 853	674	672	7 120	8 981	10 422	3 057
Purch. of goods & serv.	138	821	:	1 944	5 205	3 908	2 871	1 604	513	570	6 047	7 126	7 147	2 440
Value added	43	230	:	922	2 129	1 351	844	381	210	151	1 600	2 302	3 882	936
Personnel costs	24	149	:	639	1 243	574	528	204	152	87	1 031	1 461	2 449	667
Average personnel costs	41.4	6.1	:	37.5	35.0	5.3	11.8	2.6	13.9	6.0	37.1	38.5	30.5	44.0
Gross operating surplus	19	81	:	283	886	778	316	177	58	65	569	807	1 432	269
Gross investment	9	49	:	100	350	382	165	344	105	86	219	453	313	119
Apparent labour prod.	73.6	8.5	:	47.8	55.2	10.3	18.1	4.7	17.4	10.3	56.4	54.2	45.5	58.6
Wage adj. labour prod.	177.8	139.9	:	127.5	157.5	194.8	153.7	183.4	125.2	172.2	151.9	140.5	149.2	133.2
Gross operating rate	10.6	7.9	:	9.9	12.4	14.9	8.6	9.1	8.1	9.1	7.5	8.6	13.0	8.1
Investment rate	21.2	21.1	:	10.9	16.4	28.3	19.5	90.3	49.8	57.0	13.7	19.7	8.1	12.7

(1) Cyprus, Netherlands and Poland, 2005; unless otherwise stated, values refer to EUR million; number of enterprises and number of persons employed are given in thousands; average personnel costs and apparent labour productivity are given in EUR thousand per person; wage adjusted labour productivity, gross operating rate and investment are ratios expressed as percentages.

Source: Eurostat (SBS)

Table 5.13: Manufacture of pulp, paper and paper products (NACE Division 21)
Main indicators, 2006 (1)

	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	IT	CY	LV	LT
Enterprises	0.3	0.4	0.6	0.2	1.7	0.1	0.1	0.4	2.0	1.5	4.3	0.0	0.1	0.1
Persons employed	14.2	11.0	20.0	7.5	143.6	1.9	3.4	7.5	55.2	78.5	78.9	0.8	1.6	2.3
Turnover	4 951	290	1 949	1 412	35 700	149	600	948	12 385	19 724	20 388	65	76	126
Production	4 627	275	1 905	1 369	33 320	147	563	937	12 023	17 701	19 559	60	77	122
Purch. of goods & serv.	3 884	239	1 547	949	25 975	125	419	719	9 223	15 262	16 294	47	56	101
Value added	1 046	59	473	480	9 744	34	141	286	3 356	4 136	4 305	22	23	29
Personnel costs	702	28	220	367	6 355	19	149	181	1 905	3 437	2 695	14	10	16
Average personnel costs	50.2	2.6	11.4	49.3	44.6	10.2	44.2	26.0	35.1	43.8	37.4	18.5	6.5	7.2
Gross operating surplus	344	31	254	113	3 389	15	-8	106	1 451	699	1 610	8	12	13
Gross investment	136	37	131	91	1 511	32	18	54	1 206	724	751	5	12	10
Apparent labour prod.	73.5	5.4	23.7	64.2	67.9	18.3	41.6	38.1	60.8	52.7	54.5	28.4	13.9	12.7
Wage adj. labour prod.	146.4	204.9	208.1	130.4	152.3	180.0	94.1	146.4	172.9	120.2	145.9	153.1	215.1	177.3
Gross operating rate	6.9	10.7	13.0	8.0	9.5	10.3	-1.4	11.1	11.7	3.5	7.9	11.8	15.9	10.2
Investment rate	13.0	62.6	27.6	19.0	15.5	92.1	12.8	18.8	35.9	17.5	17.4	20.7	51.1	33.1

	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	NO
Enterprises	0.0	0.5	:	0.4	0.1	2.2	0.5	0.8	0.2	0.1	0.2	0.5	2.1	0.1
Persons employed	:	17.2	:	22.1	17.6	42.9	12.0	16.3	5.3	7.6	31.8	41.1	73.5	6.3
Turnover	:	1 107	:	5 944	5 472	3 791	2 492	584	655	1 135	15 027	13 300	16 908	2 004
Production	:	984	:	5 521	5 183	3 640	2 558	577	634	1 010	14 565	13 199	15 945	1 969
Purch. of goods & serv.	:	902	:	4 354	4 005	2 857	1 731	496	514	906	11 788	9 963	13 040	1 495
Value added	:	253	:	1 597	1 605	1 020	804	109	138	217	3 577	3 669	3 788	518
Personnel costs	:	159	:	1 051	900	343	302	67	95	77	1 864	1 902	3 086	362
Average personnel costs	:	9.4	:	47.6	51.2	8.5	25.4	4.1	18.1	10.1	58.6	50.6	42.5	58.0
Gross operating surplus	:	94	:	546	705	677	502	43	43	140	1 713	1 692	702	156
Gross investment	:	70	:	356	225	395	131	99	54	83	697	840	526	98
Apparent labour prod.	:	14.7	:	72.1	91.0	23.8	67.0	6.7	26.0	28.5	112.4	89.3	51.5	82.9
Wage adj. labour prod.	:	156.9	:	151.4	177.9	278.7	264.2	162.4	143.1	282.1	191.8	176.4	121.1	142.9
Gross operating rate	:	8.5	:	9.2	12.9	17.9	20.1	7.3	6.6	12.3	11.4	12.7	4.2	7.8
Investment rate	:	27.5	:	22.3	14.0	38.7	16.3	90.1	38.7	38.1	19.5	22.9	13.9	18.8

(1) Netherlands and Poland, 2005; unless otherwise stated, values refer to EUR million; number of enterprises and number of persons employed are given in thousands; average personnel costs and apparent labour productivity are given in EUR thousand per person; wage adjusted labour productivity, gross operating rate and investment are ratios expressed as percentages.

Source: Eurostat (SBS)