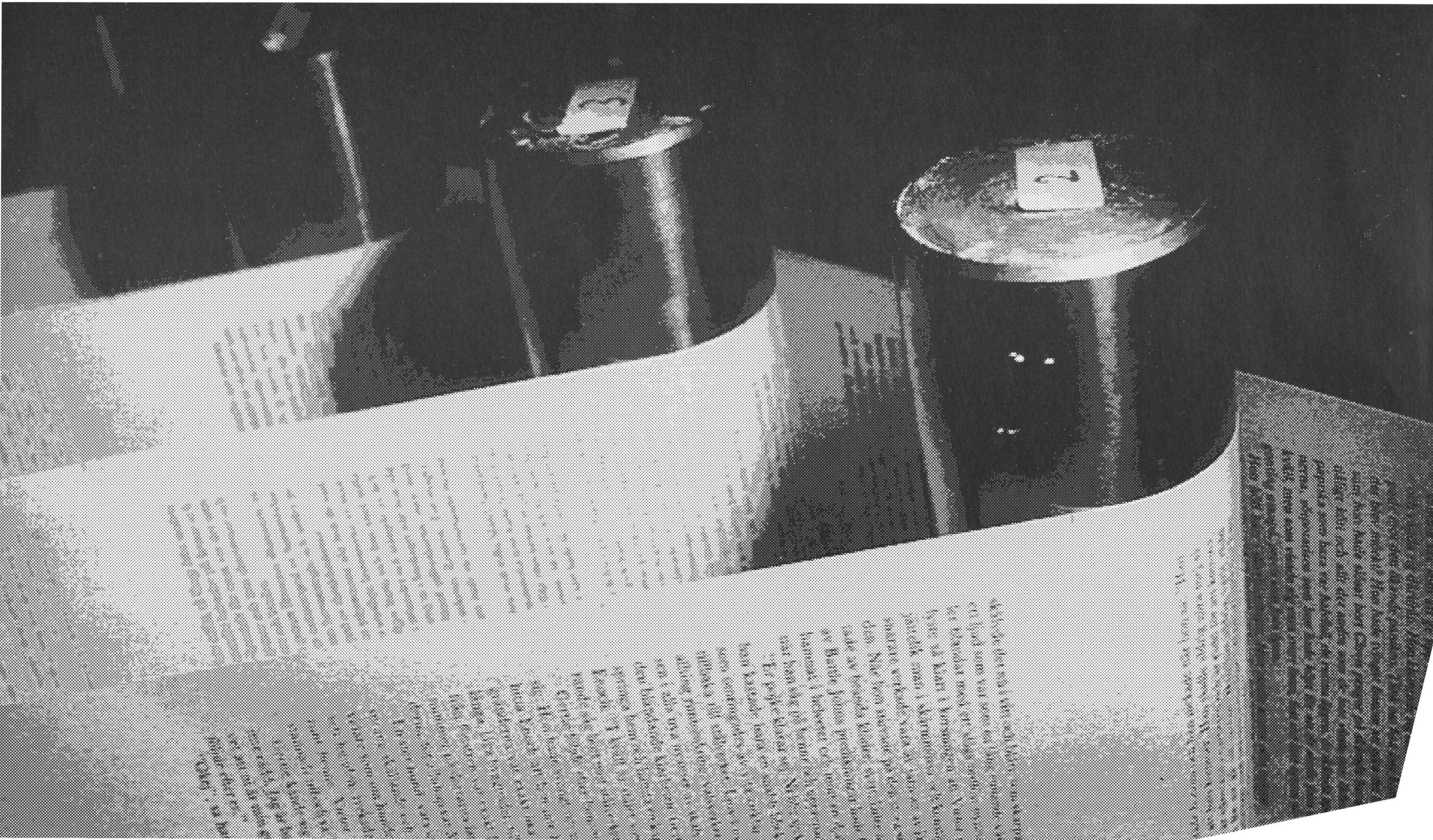
Pulp, paper, printing and publishing



Pulp, paper, printing and publishing

The European Community is - after the United States - the second largest producer and consumer of paper and cardboard.

This industry is represented by a vertical line, with vastly differing constituents, ranging from heavy industry upstream (production of paper pulp) to downstream activities connected with services such as the publishing of magazines and daily newspapers.

Despite the extreme diversity of the situations observed in the member countries, the trend over the past ten years is reflected overall in increased and steady growth of all the sub-sectors, with the exception of production of paper pulp.

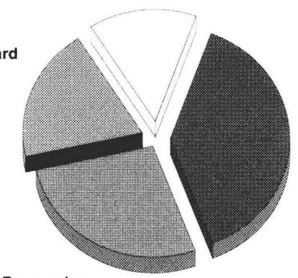
The latter activity has suffered from cyclical phenomena which have been reflected in a crisis during the first half of the 1980s and the appearance of another crisis since 1990.

This industry has undergone considerable structural upheavals (mergers, acquisitions, re-centering), which have been particularly intense for three or four years now, with three major consequences; concentration of activities, modernisation of the industrial machinery, and internationalisation.

The growth of business should continue during the next five years, at the rate of 4 to 5% per annum, thanks to the adjustment of supply to market demands.

19

Figure 1
Paper pulp, paper, printing and publishing industry
Composition of the industry: % of production, 1989



Total: 147,7 billion ECU

Source: Eurostat, DRI Europe

Description of the industry

This sector is included under NACE code 47: Paper industry and manufacture of paper goods; printing works and publishers. It includes the production of paper pulp, paper and cardboard (NACE 471), the processing of paper and cardboard (NACE 472), printing and allied industries (NACE 473) and publishing (NACE 474). The primary activity of the industry is the manufacture of paper pulp, paper and cardboard based on straw pulp.

Economic importance of the industry

Present situation With a production of approximately 148 billion ECU, this industry represents 5.9% of the total production of the manufacturing sector of the EC. Since 1982, production has experienced relatively high growth rates, both in volume and value. A growth of 10% was recorded in 1989 (4% in volume).

With 1,485,000 employees, it represents approximately 1% of the total employment of the EC. After a decreasing trend throughout the whole of the 80s, the number of jobs (except in Spain) showed a recovery from 1985-1987, depending on the countries. During the period 1987-1989, employment increased by an average of 1.7% per annum. The paper and cardboard market of the EC is the second largest market in the world. Consumption of paper and cardboard per inhabitant is, however, not so high in the EC as in North America, Scandinavia or Japan. The buoyancy of publishing activities, the information technologies, as well as the increasingly intensive use of packaging, continues to sustain the development of this industry.

Table 1
Principal characteristics of the pulp, paper, printing and publishing industry in 1989

	Production (million ECU)	Employment
Manufacture of pulp, paper and cardboard	28 600	191 000
Processing of paper and cardboard	40 300	412 000
Printing works	57 300	671 000
Daily newspapers/Periodicals	21 500	211 000
Total	147 700	1 485 000

Source : Eurostat, Sema Group Management Consultants

Production and consumption No production and consumption statistics according to value exist for the period 1980-1989 for certain sectors of the industry such as the printing and publishing of daily newspapers and magazines. However, cross-checking of data for the different sub-sectors enables total production of the industry to be evaluated at 147.7 billion ECU in 1989, as shown in table 1.

The overall growth rates of the different sub-sectors of this industry have been high, but contrasting.

- after a recession at the beginning of the 1980s, production of paper and cardboard has experienced a steady growth since 1982, increasing from 26.9 million tonnes in 1982 to 36.6 million tonnes in 1989, i.e. an average annual growth of 4.5% in weight;
- during the same period, the paper and cardboard processing industry doubled its production in value, from 20.8 billion ECU in 1980 to 40.3 billion ECU in 1989.
- the printing industry has recorded a regular growth in volume and in value. Growth has been over 7% per annum over the past ten years;
- production of daily newspapers (expressed in tonnes) has shown an overall increase at EC level (15% between 1986 and 1989), but with considerable disparities depending on countries. The Federal Republic of Germany and the United Kingdom are the only countries where the number of titles of daily newspapers has increased, these countries alone representing 60% of EC production.

Table 2
Pulp, paper, printing and publishing
EC export and import trends (printing and printing works)
Mean annual fluctuation in % current ECU

EC Exports	Total	EFTA	North America	Pacific Rim	USSR	Eastern Europe	South-East Asia	Rest of the world
1982-1988	5.17	11.75	10.80	7.49	3.86	2.85	11.28	-4.69
1982-1986	6.36	13.03	18.22	5.85	2.16	3.27	9.90	-4.39
1986-1988	2.82	9.24	-2.67	10.84	7.36	2.00	14.09	-5.29
1988-1989 (*)	10.68	9.55	15.54	8.50	27.78	4.43	20.50	10.16
EC Imports								
1982-1988	7.32	8.00	6.67	10.95	5.99	7.44	11.82	0.08
1982-1986	6.01	8.69	4.60	13.35	3.55	9.57	6.77	-5.54
1986-1988	9.99	6.64	10.93	6.29	11.05	3.31	22.65	12.34
1988-1989 (*)	9.70	11.25	26.00	5.26	10.64	6.40	8.62	7.67

(*) 6 European countries
Source : DRI

Foreign trade Unlike production and consumption, the trend of foreign trade during the past decade has been less favourable, the main reason being a steady falling-off of exchanges of the paper pulp, paper and cardboard manufacturing sub-sector, the negative trade balance of which increased from 6.3 billion ECU in 1980 to 14.9 billion ECU in 1989. During the latter year, 34% of apparent consumption of the sub-sector was covered by imports. Extra-EC imports basically originate from the Scandinavian countries and North America, and are mainly concentrated on bulk products of lower quality or "utility" qualities (paper pulps, kraft liners, newsprint). On the other hand, the paper and cardboard processing and printing sub-sectors recorded surpluses of 497 and 596 million ECU respectively in 1989. The share of extra-EC exports consequently represented 7% of the value of production. During the period 1980-1989 the balance of each of these sub-sectors has continued to be positive.

Investment Investment has increased rapidly over the past three years in the different sub-sectors of the industry.

In the field of paper pulp, paper and cardboard manufacture, after a period of under-investment between 1980 and 1983, investments have recorded a brisk recovery, increasing from 777 billion ECU in 1983 to 1,840 billion ECU in 1987.

The paper and cardboard processing sector, in which up to 1984 investment was relatively low, has strongly increased its investments over the past 5 years. Investments have increased from 1.2 billion ECU in 1984 to 2 billion ECU in 1989.

The sub-sectors of printing, periodicals and the daily press have in turn made considerable investment efforts to modernise their production techniques.

The structure of the industry

As a whole, the industry has undergone considerable development over the past ten years as a result of concentration and internationalisation.

In the sub-sector of paper pulp, paper and cardboard production, the number of factories has steadily decreased, but with an increase of average capacities. In 1989 the number of paper factories in the EC with capacities of over 100,000 tonnes per annum increased to 100, representing 10% of all operating units as well as around 40 to 45% of the total production of the Community.

During the past three years, the sectors of manufacture and processing of paper and cardboard have seen a rapid wave of acquisitions, creation of particular partnerships, and mergers. North American, Community and especially Scandinavian companies are trying to create a strong position for themselves in an increasingly competitive and homogeneous market.

The Scandinavian companies, the number of which has recently considerably decreased, are particularly aggressive. A large share of their production is exported to the EC countries and they therefore consider it essential, with 1992 in mind, to have production installations in the member States.

It is mainly the sector of manufacture of paper and cardboard which is undergoing restructuring and being combined in a few large production units. The paper and cardboard processing industry still consists of small and medium-sized companies. This enables it to be more flexible and to adapt rapidly to changes of market conditions. Companies in this type of industry are generally located near agro-food factories, in view of the fact that the major part of their production is destined for food packaging and because transport over long distances is difficult and costly.

During 1990, there has been a sustained

rate of mergers and acquisitions, involving, just as in previous years, some of the largest companies in this industry.

The most outstanding occurrence at world level has been the take-over of American paper-manufacturers Great Northern Nekooska by their compatriot Georgia Pacific, the new entity becoming the biggest paper-manufacturer in the world, ahead of International Paper.

At European level, in the sector of manufacture, processing and distribution of paper and card, several outstanding operations can be pointed out; the association Kymmene (Finland) / Stora (Sweden) has purchased Chapelle Darblay, the leading French manufacturer of newsprint, Stora has also purchased Feldmühle Nobel, the market leader in paper in the Federal Republic of Germany; Arjomari (France) has purchased Quaife Paper, one of the six leading British distributors of paper; Charfa, a large French company manufacturing paper bags, has been acquired by the Swedish NCB; in the Netherlands, the paper distributor VRG has been bought by KNP.

Finally, the rapprochement of James River (United States), Ferruzzi (Italy) and Nokia (Finland) in the field of toilet papers has enabled a group to be formed which is one of the three largest in the world in this field.

In the publishing and press sector, acquisition of interests and take-overs have continued, with a recent orientation resulting from the growing attraction represented by the markets of Eastern Europe and the USSR. In this connection, for example, the establishment of the French group Hachette on the Soviet publishing market, through an association with the Editions du Progrès group, as well as the participation of the Hersant group in the capital of the Hungarian daily newspaper Magyar Nemzet deserves a mention. The internationalisation of publishing groups has also continued:

- acquisition of a holding by the Italian Mondadori and the Spanish Prisa in Newspaper Publishing, which publishes the "The Independent" newspaper (United Kingdom);
- rearrangement of the capital of the Gallimard group (France), which now becomes Franco-Italian;
- strengthening of the position of the Hachette group in the United States as wholesale newsagents, by the acquisition of a majority shareholding in Imperial News Company, the fourth largest American wholesaler of magazines and paperback books.

In the majority of the countries of the Community a tendency can also be seen towards internationalisation of ownership of shares, both for the periodical press and for the daily newspapers.

Risks and opportunities

The main weakness of the industry is its dependence on imports of commercialised paper pulp and medium quality paper and cardboard.

Two factors represent essential opportunities to reduce the risk of aggravation of this dependence. Firstly, the intensification of collection of paper for recycling and the use of recycled paper on a large scale, and secondly, the encouragement of the use of existing forestry resources as well as the creation of new resources.

In the sub-sector of processing of paper and cardboard, the varying ability of the small and medium-sized businesses in the EC to adjust to the evolution of rules and standards relative to products and manufacturing processes will also be a decisive factor.

In the sub-sector of printing works, changes of secondary jobs into tertiary jobs necessitate a thorough retraining of wage-earners. Optimisation of training conditions in the new technologies will be a determining factor in respect of evolution in the next few years.

Economies of scale, continuous improvements in the quality of products and services, well organised and established distribution networks, access to new advances in technology (especially in the printing sector) will become the key points of development in future years. There will, however, always be a place for the smaller firms which are specialised and orientated towards specific market slots.

The demand for advertising and printed sales literature (for instance, catalogues and direct mail shots) has strongly increased in the EC during the past ten years, as well as in the United States.

It will probably enable companies to sustain growth in this sector, particularly towards 1992. In the field of the daily press and periodicals, specialisation appears to be the best way of protecting the written word against competition from the audio-visual media.

Outlook

The situation of a surplus of production capacity and falling prices, which has appeared in 1990 in the manufacture of commercialised paper pulp, should persist through to 1992-1983, under the effect of the starting up of new factories already in the pipeline and a certain settling down in the demand for cardboard paper.

The growth in processing of paper and cardboard, printing and publishing will, on the other hand, continue to be stimulated by a sustained demand and by the opening-up of the countries of Eastern Europe. Overall, during the next few years, the growth of activity of the industry should continue, at the rate of 3 to 4% per annum for paper pulp (approximately 2% per annum for commercial pulp) and 3 to 6% for processing.

Printers and publishers, for their part, should record growth rates of 3 to 4% per annum with the approach of 1992.

Written by: Sema Group Management Consultants

Table 3
Paper pulp, paper, printing and publishing
Production forecast
(million ECU 1989)

	1989	1990	1991/90 %	1992/91 %	1994/92 %
Manufacture of pulp, paper and cardboard	28 639	29 100	3.7	3.5	N/A
Processing of paper and cardboard	40 347	41 690	6.0	6.0	N/A
Printing works	57 336	59 056	3.0	4.0	N/A
Total	126 322	129 846	4.5	4.5	4.0

Source: SEMA

Pulp, paper and board manufacturing

In 1989, total pulp, paper and board output in the EC came to 28.6 thousand million ECU that is 12% more than in 1988. This remarkable performance not only reflects a new record volume of 36.6 million tonnes, but also higher prices, which is particularly true for the production of pulp. Value rose by near 23% to reach 2.3 thousand million ECU against an increase of around 2.2% in volume. Overall, therefore, the situation in the entire sector in 1989 was an excellent one, benefitting from stable demand.

Description of sector

According to NACE, the pulp, paper and board industry falls within category 471, which is divided into three sub-categories: the manufacture of pulp other than macerated straw pulp (NACE 471.1), the manufacture of paper and board from straw (including the production of straw pulp) (NACE 471.2) and the manufacture of paper and board (NACE 473.3). This latter sub-category includes the manufacture of printing and writing paper, the manufacture of kraft paper and board and wrapping paper, the manufacture of thin paper and the manufacture of cartonboard.

As far as their use is concerned, paper and board are generally seen as filling three essential functions:

- communication; press, education and culture, advertising, administration and office work (graphic paper);
- packaging and protection: for the conditioning, stocking, transporting and presentation of products for retailing (packaging papers and boards);
- other specific functions and applications: hygienic and sanitary; fiduciary (money, cheques, securities); building (wallpaper); technical (filters, insulation, cigarettes, etc.)

Current situation

The European pulp and paper industry experienced constant and sustained growth during the 1980s at above Community GDP. The strength of the publishing industry, information technologies, food distribution and consumer marketing continues to support the industry's development.

The rhythm of capital investment and active restructuring was maintained in 1989, allowing the industry to bolster its competitive position internationally, and the continued expansion of exports to countries outside the EC is clear proof of this. The combined value of EC pulp, paper and

Table 1
Pulp, paper and board manufacturing
Main Indicators, 1980-90

(million ECU)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990(¹)
Apparent consumption	21 240	23 755	24 174	25 087	30 636	30 924	31 205	33 994	38 110	43 521	43 674
Net exports	- 6 343	- 7 494	- 7 579	- 7 925	- 9 742	- 9 438	- 9 523	- 10 992	- 12 472	- 14 882	- 14 574
Production	14 897	16 261	16 595	17 162	20 894	21 486	21 682	23 002	25 638	28 639	29 100
Employment (thousands)	232	212.1	203	192	186	179	178.9	175	189	191	N/A

(¹) Estimated SEMA
Source: CEPAC, Eurostat (Comext)

board production in 1989 has been estimated at 28.6 thousand million ECU.

Indicators The combined turnover of the paper industry with the connected sectors of paper conversion and printing amounts to 4.6% of total turnover for all manufacturing industries.

In 1989, total world production of paper and board was around 233 million tonnes. The EC, whose output and consumption came to 36.6 million tonnes of paper and 49.4 million tonnes of board in 1989, accounted for 15.6% of world output and 21.2% of world consumption. The Community is the world's second largest producer and consumer, after the United States. The respective percentages have changed very little compared to previous years. As far as market pulp is concerned, total international trade (excluding trade between EC countries) is around 24.7 million tonnes. The EC is by far the world's biggest market, with the 8.1 million tonnes imported in 1989 accounting for 33% of the world total.

The balance of payments deficit in the pulp, paper and board sector overall grew once again in 1989 both in terms of volume and value. The deficit in terms of value rose much more than by volume due to the very high prices in the market pulp sector especially (up 20% in 1989 compared to 1988).

As the table shows, the combined tonnage deficit rose by 700,000 tonnes, or 3.4%, to exceed 20 million tonnes in 1989. In value terms, the deficit grew by 19% compared to 1988, reaching 14.8 thousand million ECU, or half of the combined production value of the entire sector.

Table 2
Pulp, paper and board manufacturing
External trade deficit 1988 and 1989

	1988		1989	
	million tonnes	billion ECU	million tonnes	billion ECU
Paper and board	12.2	7.8	12.7	8.6
Market pulp	7.9	5.1	8.1	6.2
Total deficit	20.1	12.9	20.8	14.8

Source: CEPAC

The paper and board sector

Since 1980 recession, paper and board production has grown steadily.

EC output, which in 1989 stood at 36 million tonnes, is only half that of United States output (69.5 million tonnes), but is almost one and a half times greater than Japanese output (26.8 million tonnes). The EC is the world's second largest producer of paper and board.

More than 92% of Community production, i.e. 33.7 million tonnes, was sold on markets within the EC. This volume accounted for 68.2% of EC consumption in 1989. The involvement of European industry in the domestic market has slowly but surely declined since it stood at 72.8% in 1980.

Exports have grown at a faster rate than imports. Exports to outside the EC have reached a record level of 2.9 million tonnes. These exports presently account for 7.9% of total output, a figure which has grown regularly over the past years.

Imports of paper and board from outside the EC essentially come from Nordic countries and North America, and are particularly concentrated in lower value-added bulk or "commodity" grades of paper and board. In 1989, they reached 15.6 million tonnes, or 43% of total production.

The import penetration level is higher for kraft covering and newsprint. These two commodity grade sectors account for around 40% of all EC imports.

Most EC exports are high-quality products like coated graphic paper and folding boxboard. The export/import ratio is higher by value than by volume. Investments accounted for around 8% of production.

Market pulp sector Total EC production of pulp for paper-making has risen by 2% to reach 9.5 million tonnes.

Pulp integrated directly into paper and board production is included in this figure, as is "market pulp" (pulp which is dried and sold to third parties). Market pulp pro-

Table 3
Paper and board
Production, external trade and investment, 1980-89

(million ECU)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Production										
Value	14 192	15 350	15 680	16 190	19 596	20 184	20 406	21 460	23 769	26 346
Index	70.3	76.1	77.7	80.2	97.1	100	101.1	106.3	117.8	130.5
Quantity (thousand tonnes)	27 759	27 534	26 885	27 637	30 039	29 771	30 994	32 799	35 011	36 610
Index	93.2	92.5	90.3	92.8	100.9	100	104.1	110.2	117.6	123
Exports extra-EC										
Value	1 144	1 263	1 277	1 442	2 086	2 279	1 998	2 282	2 652	3 077
Index	50.2	55.4	56	63.3	91.5	100	87.7	100.1	116.4	135
Quantity (thousand tonnes)	1 474	1 401	1 318	1 497	2 046	2 123	2 002	2 326	2 645	2 896
Index	69.4	66	62.1	70.5	96.4	100	94.3	109.6	124.6	136.4
Imports extra-EC										
Value	4 796	5 403	5 689	6 220	7 479	7 854	8 020	9 150	10 446	11 700
Index	61.1	68.8	72.4	79.2	95.2	100	102.1	116.5	133	148.9
Quantity (thousand tonnes)	9 842	10 022	10 040	10 778	11 696	11 638	12 672	13 652	14 809	15 648
Index	84.6	86.1	86.3	92.6	100.5	100	108.9	117.3	127.2	134.4
X/M	0.24	0.23	0.22	0.23	0.28	0.29	0.25	0.25	0.25	0.26
Gross investment	1 078	927	796	777	1 150	1 589	1 610	1 840	N/A	N/A

Source: CEPAC, Eurostat (Comext)

duction stands at 3.5 million tonnes. Net imports from outside the EC have only risen by 1.9% compared to 1988 to reach 8.1 million tonnes. This is due to the sharp increase in the price of market pulp.

The effect of this price rise was to markedly increase the net balance of payments deficit in the market pulp sector (6.26 thousand million ECU, i.e. up by 23% compared to 1988).

Total market pulp consumption (used to make paper and board or hygienic products) has, at 11.5 million tonnes, risen by only 2%, which is less than the growth rate for paper and board production.

Total consumption of all pulps (integrated and market) amounted to 17.6 million tonnes in 1988. Consumption of wastepaper in 1989 reached a record level with, at 18 million tonnes in 1989, 6% up compared to 1988. These recycled fibres accounted for over 49% of the fibre raw materials used by industry. This is one of the highest levels in the world, registering a further increase compared to the previous year. Investment accounted for 5% to 6% of production.

Employment

Total employment in paper and board mills (around 178,000 persons in 1989), rose slightly (up 1% compared to 1988).

12,000 persons are also employed in market pulp mills within the Community.

In the short term, these two figures should stabilise at these levels.

As far as the manufacture of paper and board is concerned, total employment has fallen by 22% since 1980, while production rose by 25%. Productivity per employee moved from 120 tonnes a year in 1980 to 191 tonnes in 1989.

Structure of the industry

The number of paper companies and mills fell steadily between 1980 and 1989. In parallel, the average size of paper-manufacturing production units increased sharply during the 1980s. The closure of small mills with low output was compensated for by the steady growth of large production units.

In June 1980, the Swedish firm, Svenska Cellulosa (SCA), acquired the British company Reedpack Ltd. for $ 937 million. This operation marked a new stage in the control of the Community market by Scandinavian paper mills. In less than five years, the large Finnish (Kymmene, UPM), Swedish (Stora, Svenska Cellulosa, Modo, NCB) and Norwegian (NSI) groups have gained a foothold in the Community market. In April 1990, the Swedish producer, Stora, Europe's number one in the sector, took over the German firm, Feldmuehle Nobel (the largest Community producer). With its new acquisition, Stora is set to attain a production capacity of 6.2 million tonnes a year, which would move it up from thirteenth to fourth in the world league table behind Georgia Pacific, International Paper and James River.

Other acquisitions have also changed the structure of the industry in the Community. In 1989, the New Zealand group, Fletcher Challenge, acquired the British firm, UK Paper, for $ 299 million; the Dutch firm of Buhrmann-Tetterode paid $154 million for another British firm, Rober Horne, while, more recently, the American Scott Paper

Table 4
Market pulp
Production, external trade and investment, 1980-89

(million ECU)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Production										
Value	705	911	915	972	1298	1302	1276	1542	1869	2293
Index	54.1	70	70.3	74.7	99.7	100	98	118.4	143.5	176.1
Quantity (thousand tonnes)	2 190	2 240	2 241	2 528	2 535	2 917	3 124	3 363	3 458	3 536
Index	75.1	76.8	76.8	86.7	86.9	100	107.1	115.3	118.5	121.2
Exports extra-EC										
Value	78	112	101	119	172	192	156	209	243	276
Index	40.6	58.3	52.6	62	89.6	100	81.3	108.9	126.6	143.9
Quantity (thousand tonnes)	237	275	250	336	323	472	379	447	446	422.5
Index	50.2	58.3	53	71.2	68.4	100	80.3	94.7	94.5	89.5
Imports extra-EC										
Value	2 769	3 466	3 268	3 266	4 521	4 055	3 657	4 333	5 345	6 535
Index	68.3	85.5	80.6	80.5	111.5	100	90.2	106.9	131.8	161.2
Quantity (thousand tonnes)	7 776	7 522	6 874	7 366	7 675	7 701	8 034	8 363	8 365	8 523
Index	101	97.7	89.3	95.6	99.7	100	104.3	108.6	108.6	110.6
X/M	0.03	0.03	0.03	0.04	0.04	0.05	0.04	0.05	0.05	0.04
Gross investment	118	104	92	106	82	93	85	85	N/A	N/A

Source: CEPAC

Table 5
Pulp, paper and board manufacturing
Number of companies and mills in the EC

	Paper and board		Market pulp	
	No. of Companies	No. of Units	No. of Companies	No. of Units
1980	961	1 220	23	29
1981	932	1 179	22	28
1982	909	1 158	22	28
1983	871	1 098	22	28
1984	848	1 068	23	29
1985	831	1 037	23	29
1986	818	1 014	23	29
1987	793	990	35	30
1988	774	951	N/A	31
1989	769	947	N/A	34

Source: CEPAC

Table 6
Pulp, paper and board manufacturing
Hourly labour costs, 1987

(ECU)	
Belgique/België	17.0
BR Deutschland	15.3
France	10.1
Italia	15.1
Nederland	13.5

Source: CEPAC

company paid $ 250 million for the operations of Feldmuehle.

The number of paper mills in the EC which can be viewed as major concerns (production of over 100,000 tonnes/year) rose by 6% in 1989 to reach 100. This number only accounts for 10% of all working units, but it is estimated that these mills supply 40 to 45% of total Community production. During the same period, the number of small mills in the Community (fewer than 5,000 tonnes a year) fell by 2% to 248 units.

Trade

The average value of paper and board exports from the EC rose by 6% in 1989 to reach ECU 1,062/tonne; the average value of imports registered an identical percentage increase to reach ECU 748/tonne.

Although paper and board exports to outside the Community rose steadily throughout the decade (at a faster rate than imports), EC net imports are considerable and keep on rising. The balance of payments deficit in the paper and board sector is of the order of 12.7 million tonnes, thought to be worth 8.6 thousand million ECU (i.e. an increase of 10.2% compared to 1988).

The industry's chief weakness is its dependence on imports of market pulp (net imports of 8.1 million tonnes). Many mills are only partially or not at all equipped to manufacture pulp. Market pulp purchases produced an additional net external deficit of around 6.2 thousand million ECU in 1989. Large differences are to be seen between European countries. As a result, the industry's overall balance of payments deficit reached 14.8 thousand million ECU in 1989, an increase of 14.7% compared to the previous year. Imports of market pulp were partly offset by the availability of abundant quantities of wastepaper, and efforts will therefore need to be intensified within the EC to promote the collection and use of recycled paper.

Furthermore, the EC has favourable climatic conditions and forest resources which are sufficient to improve the supply of wood and raise market pulp production potential. The industry is encouraging the use of existing forest resources, as well as the development of new resources.

Trade between EC Member States has been growing at a rate of 10% for some years. The result is that nearly 25% of paper and board produced in the Community is sold to other EC partners.

Consumption and production

Apparent consumption in the EC of paper and board rose by near 5% last year to reach a record 49.3 million tonnes. This level is the world's second highest after the United States (around 70 million tonnes). Since 1985, EC consumption has grown by 25%. Paper and board production has closely followed consumption with a rise of 4.5% to reach a further record of 36.6 million tonnes. This is the fourth year in succession with record production.

The Federal Republic of Germany is the leading paper and board producer with 30% of EC production, followed by France and Italy. Portugal is the dominant country in pulp. As a result, the import penetration level increased its upward trend and rose to 31.7%. Since 1980, when it accounted for 27.2%, it has risen every year.

Analysis of different products from the industry

Nine sectors can be identified and form the subject of a statistical analysis. They have been chosen as the nine principal sectors in terms of current volume and future growth. Each sector contains at least two grades (in the case of newsprint and kraft coverings) or several dozen (coated and uncoated graphic paper). The key differentiating factors between the different degrees of grade are; weight and basic material, fibre composition (types of pulp or wastepaper), surface treatment (coating), physical properties (stiffness, strength) and optical properties (brightness, opacity, gloss).

The combined volume of the nine sectors covers around 93% of total EC production and consumption.

The sectors which have not been considered are: semi-chemical fluting, some speciality boards and certain types of industrial paper.

❖ Newsprint

Essentially made from mechanical pulp and/or wastepaper, to which small quantities of inorganic filler material are sometimes added, newsprint can be lightly calendered to improve its gloss or brightness, or lightly coloured. It is used for letterpress, flexographic or offset printing.

Newsprint consumption - which is greatly influenced by spending on advertising - has seen growth of the order of 5% a year since 1984 and of 7.7% in 1989.

Table 7
Pulp, paper and board
Main companies: Turnover and production by country in 1988

Companies	Countries	Turnover 1988 (thousand ECU)	Production 1988 (thousand ECU) Market pulp	Paper and board
Feldmuehle	BR Deutschland	84 206		1 700
PWA	BR Deutschland	80 690		1 350
Wiggins teape	United Kingdom	75 679	310	330
Arjomari	France	57 380		580
Cellulose du pin	France	54 648	140	1 070
KNP	Nederland	52 577		1 320
Cartiere Burgo	Italia	47 156		1 100
Buhrmann-Tetterode	Nederland	44 216		733
Reedpack	United Kingdom	42 020		650
Haindl	BR Deutschland	36 057		1 100
Aussedat-rey	France	28 856		500
La rochette	France	27 737	430	237

Sources : PPI, companies' annual report

Table 8
Paper, pulp import export share by country
(%)

Countries	Import rate (compared to consumption)	Export rate (compared to production)
Belgique/België/Luxembourg	86	76
Danmark	84	48
BR Deutschland	47	39
España	28	14
France	46	33
Italia	35	21
Nederland	77	73
Portugal	29	33
United Kingdom	63	19

Source : Sema Group Management Consultants

Table 9
Pulp, paper and board manufacturing
Production by country, 1989

(million ECU)	Paper and board	Pulp	Total
EC	26 346	2 293	28 639
Belgique/België/Luxembourg	1 332	177	1 509
Danmark	238	67	305
BR Deutschland	7 970	87	8 057
Hellas	266	0	266
España	2 334	310	2 644
France	4 900	625	5 525
Ireland	20	0	20
Italia	4 230	189	4 419
Nederland	1 700	0	1 700
Portugal	511	838	1 349
United Kingdom	2 845	0	2 845

Source : Sema Group Management Consultants

The expansion of offset and flexographic printing and hence the greater use of colour in newspapers has stimulated advertising in newspapers and their consumption. Production volume in the EC has seen growth of 8% a year since 1984, and of around 4% in 1989. Several totally new paper mills were built in the EC during the 1980s, while the construction of at least two others will have been completed before 1991. Production in the United Kingdom went from 84,000 tonnes in 1982 to 573,000 tonnes in 1989.

There are only a few producers in this sector and the average size of mills is relatively big, leaving them on a sound footing in international competition.

Imports mainly come from Sweden, Norway, Finland and Canada.

❖ Coated graphic paper

Production has risen by 7.6%, while apparent consumption exceeded 7.3%.

This sector includes coated mechanical printing paper and coated wood-free paper. The former contains a mixture of mechanical and chemical pulp and is used to print catalogues, magazines and advertising material in gravure or offset. It contains fillers, is coated with pigments on both sides and can be either glossy or matt. Wood-free coated paper contains little or no mechanical pulp, is heavier in weight than coated mechanical paper and is used for high-quality printed products such as annual reports, etc. External trade in coated graphic paper has grown faster than production. In spite of the latter increasing strongly, net imports for last year still came to 709,000 tonnes, having more than tripled since 1980. The main countries to supply these types of paper are Finland, Sweden and Austria. The new machinery typical of these types of product should be capable of producing 200,000 tonnes a year. As a result, this sector too is favouring concentration into large production units which can compete internationally. The sharp rise in new capacity, both in the EC and the main supply countries, has resulted in overcapacity in the sector. This could persist for some years, even if exports continue to rise.

❖ Uncoated graphic paper

This sector also contains mechanical and wood-free grades. Known also under the name of groundwood or wood-containing paper, this grade includes directory paper and heavily-filled and supercalendered (SC) paper. It is essentially sold in reels and is used in printed rotogravure and printed offset.

Production increased by 1% last year to reach 7.05 million tonnes.

Net growth in imports reached over 2.5 million tonnes, an increase of 12% compared to 1988, while the import penetration level exceeded 32%. In 1980, it had stood at 20%

The wood-free paper sector is by far the biggest of the two, with growth of 3 to 4% a year. These grades are being subjected to mounting pressure from imports essentially from the Nordic countries, who gain by integrating chemical pulp, and also Brazil.

The wood-free grades sector is characterised by a relatively large number of small producers, although a few large producers are responsible for most total production.

❖ Kraftliner paper

Kraftliner paper is used for the outer lining of corrugated board in the manufacture of boxes. This is a low-value article traded internationally.

European kraftliner paper production rose by 11.8% in 1989 to reach 785,000 tonnes. Spain and Portugal were the prime movers behind this, since, along with France, they produce virtually all the EC's kraftliner paper.

Consumption reached 2.9 million tonnes, fuelled by the 10% rise in imports essentially from the United States, Sweden and Finland. The import penetration level (78.9%) rouse by around one percentage point. This represents the highest level recorded by grades in the study.

Kraftliner is in competition with superior grades of testliner which are produced in large quantities in the EC.

❖ Material for making boxes out of wastepaper

This sector includes testliner (used for the outer lining of corrugated board) and Wellenstoff (used for the inner lining of corrugated board). These products are manufactured in varying grades from different types of wastepaper. Testliner is the main kraftliner substitute to be imported. Its production volume of 8.2 million tonnes in 1989 makes this sector the biggest in the Community. In 1989, production rose by 7.4%.

These articles are produced in all the Member States, with production spread fairly evenly. A large number of small producers can be counted in this sector.

❖ Packaging paper

Packaging paper can be made from all grades of pulp or wastepaper, or from any combination of these constituents. Depending on their final use, the substances range from thin paper (less than 30 mg/ m^2) up to 225 g/ m^2, although output mostly varies between 25 and 100 g/ m^2.

Packaging paper is produced in accordance with a series of physical and optical specifications, such as strength and stiffness. They can be machine-finished, glazed, calendered, bleached, unbleached, coloured, transparent, opaque or acid-free. They are marketed in rolls or in sheets. End uses range from household wrapping to all kinds of industrial packaging from small bags to large sacks. Food packaging has become very important, particularly as far as numerous types of flexible packaging are concerned (used also in the non-food sector). Packaging paper is also used as the base paper for other uses - surface treatment, waxing, coating. Many papers of this type are seen as speciality papers.

The possibility of combining different types of paper or combining other materials has produced new properties and broadened the range of uses - new technology has meant that many of these packaging materials are also recyclable.

Although it has been replaced in some areas by plastics (film), paper appears to have recovered its market for ecological reasons, which have caused the public aim to use paper (wastepaper as a raw material and the recycling possibilities of used packaging paper).

European Community producers are having to defend their market share against a strong international challenge mounted essentially by Nordic countries.

Output figures for 1988 - compared to those for 1987 - vary for the various types of packaging paper from +11% to -8% overall. Production has risen by 1.9% and consumption by 1.5%.

❖ Folding boxboard

This board has excellent properties of flexibility and stiffness, and is used to make folding cartons for consumer products.

Table 10
Pulp, paper and board manufacturing
Production, consumption and trade by subsector

(thousand tonnes)	1988	1989
Newsprint		
Apparent consumption	6 043	6 507
Net exports	-3386	-3730
EC production	2 657	2 769
Coated graphic papers		
Apparent consumption	6 706	7 199
Net exports	- 675	-709
EC production	6 031	6 490
Uncoated graphic papers		
Apparent consumption	9 241	9 592
Net exports	- 2 270	-2544
EC production	6 971	7 048
Kraftliner		
Apparent consumption	2 969	2 884
Net exports	- 2 267	- 2 099
EC production	702	785
Casemaking materials based on wastepaper		
Apparent consumption	8 310	8 927
Net exports	- 652	- 702
EC production	7 658	8 225
Folding boxboard		
Apparent consumption	8 816	8 956
Net exports	- 2 208	- 2 222
EC production	6 608	6 734
Greyboards and other boards		
Apparent consumption	1 941	2 066
Net exports	- 146	- 171
EC production	1 795	1 895
Hygienic and sanitary		
Apparent consumption	2 506	2 558
Net exports	- 201	- 191
EC production	2 305	2 367

Source: CEPAC, Eurostat (Comext)

The import penetration level rose relatively quickly in the sector during the 1980s. Nevertheless, it has fallen to around 25% as a result of the revised classification. Most imports are generated in the sector of folding boxes made out of virgin pulp, which stem essentially from Sweden, Finland and the United States. Among those grades experiencing strong growth is liquid packaging board used to make carton packs for milk, juices and other drinks. Demand for liquid packaging board is being met almost in full by producers outside the Community.

EC production is concentrated on grades containing wastepaper. The growth in EC production remained modest during the 1980s. The potential is there to increase capacity in directly integrated pulp, chemical and mechanical pulp in France, Portugal and Spain.

❖ Greyboard and other types of board

Greyboard, as it name suggests, is grey in colour and is generally manufactured from low-quality wastepaper.

This sector too only recorded modest growth, both in production and consumption, during the 1980s (1.5% a year). Last year saw an increase of 9.5%, although future growth is set to slow down appreciably. European industry's domestic market share is large and stable (91%).

❖ Hygienic and sanitary products

The papers used for household or sanitary ends can be made from virgin pulp, which has generally been bleached and contains variable grades of secondary fibre reaching as high as 100%. The main products are hygienic paper, napkins and industrial wipes.

During the past decade, this sector has been one of the most dynamic in EC industry (growth in output of around 5% a year). The growth in output last year recorded the same trend (up 2.6%), while production reached 2.4 million tonnes. In 1989, growth in apparent consumption was of the same order (2.1%). Virtually all production was converted directly by paper companies into consumer products.

The sector is dominated by a limited number of very large producers, of whom most are subsidiaries of Nordic or American companies.

The EC is broadly self-sufficient (92%) in these grades. As they are very bulky, hygienic papers cannot be easily transported. Imports essentially come from Austria, Sweden and Finland.

Geographical characteristics

There are appreciable differences between the Member States of the Community in the structure of both production and markets. As far as wood resources, for example, are concerned, Italy is at a disadvantage, while the United Kingdom has had little success in cutting its deficit.

The production of various grades of pulp and paper is also spread unevenly. To give a few examples: market pulp production is concentrated in Portugal, Spain, France and Belgium. Newsprint is manufactured chiefly in the Federal Republic of Germany, France and Italy; kraftliner comes essentially from France; uncoated graphic paper from the Federal Republic of Germany, the United Kingdom, Italy and Spain.

Major differences also exist, for various reasons, in sizes of mill and machinery capacity. The most marked increases have been produced by Belgium and the Netherlands, through the implementation of new machinery with high capacity. The difference in size between EC mills and those in Nordic countries and Canada (larger in the latter two), can be explained by the presence of national specificity.

The EC paper industry was actually developed at the outset to supply all grades of paper and board for individual national markets. It was only during the past few years that industry began to supply a wider European market.

In contrast, the paper industries in Nordic countries and in Canada, which are backed by huge forestry resources, are concentrated on exports of mass consumption grades. It was only recently that they diversified into producing high quality articles intended chiefly for the EC market.

Around 90% of imports are not subjected to any customs duties. These essentially come from EFTA countries, but also from Canada and other member and non-member countries of GATT and developing countries, particularly Brazil.

Raw materials

Wood fibre, both virgin and from recycling, is the dominant raw material in the manufacture of paper, accounting for 85% of raw materials used by the producing industry. It can therefore be said that the manufacture of pulp and paper constitutes vertical integration in the forestry sector.

As such, it is directly reliant on forestry policy, both in EC countries and other paper-producing countries. The latter either supply pulp to the EC as a raw material, or try to compete with the EC in paper and board products, or even combine the two.

Other pulps, albeit to a lesser degree, are used in the EC generally for a particular application such as filter paper, banknote paper or security paper. The production of paper from annual crops (cotton, sugar cane bagasse, bamboo, abaca, sisal, rice and wheat straw, reeds) is concentrated in tropical countries and/or countries without their own wood.

Mineral outgoings (china clay, kaolin, talc, calcium carbonate) and binders (starch and latex) account for 12 to 15% of the total tonnage of raw materials used.

Table 12 shows the composition of raw materials for the EC in 1988. Integrated and market wood pulp are the most important raw materials with 44% of total usage. Total consumption exceeds total production by 12 to 14% of volume in terms of tonnage within the EC. This is due to the losses which are a normal occurrence in the manufacturing process, amplified in the case of EC industry by the high rate of wastepaper use, which produces bigger losses than virgin pulp.

Wood The production of one tonne of bleached chemical pulp requires the use of around five steres of wood; one tonne of mechanical pulp uses roughly half of this volume. The price of wood is the most expensive cost factor in the production of all pulps. The length of the manufacturing process and qualitative value are inversely proportionate to the price of wood in total production costs. As a result, the cost of wood is an important factor (30 to 40%) in newsprint, but is far less so in the case of coated graphic paper (15 to 20%).

The Community is broadly self-sufficient (92%) in wood for its current level of both integrated and market pulp production. However, any major expansion of pulp capacity will be difficult without intensifying silvicultural activity, both in terms of using existing forests and expanding plantation forests in Spain and Portugal.

A number of other forestry resources are to be found in the EC, enabling pulp production to expand. These resources to be found essentially in France, the Federal Republic of Germany and the United Kingdom. Coniferous species (spruce, pine) have traditionally been reserved for industrial use, although deciduous and hardwood species (birch, eucalyptus) have proved useful in the past few years. In particular, fast-growing eucalyptus has become one of the paper-making fibre industry's favourites. Its availability in Spain and Portugal, where it is grown in man-made plantations, is a major advantage for the industry in the EC.

Pulp and market pulp The EC is producing 9 million tonnes of wood pulp, i.e. 1.4% more than in 1988, with which it supplies paper and board mills. This figure includes both pulp which is integrated directly into paper and board production, and pulp which is dried and sold on the market ("market pulp").

The United States occupies the leading position with total production of 56 million tonnes of pulp (1989), followed by Canada with around 24 million tonnes and Sweden with 10.3 million.

The overall volume of pulp produced in the EC, however, only accounts for half (53% in 1989) the total pulp consumed in the production of paper and board. The remainder is imported in the form of market pulp.

The EC's dependence on imports of market pulp was, however, cut with Spain's and, particularly, Portugal's entry into the Community.

In the last few years, the dependence of market pulp imports on the EC has changed little, slipping from 80% in 1980 to 77% today. Market pulp is produced in seven Member States. Portugal, Spain and France are, in that order, responsible for 70% of this total. These same countries are the ones likely to increase their market pulp capacity, although additional capacity will also be created in Belgium. Despite these developments, the EC will remain highly dependent on pulp imports, with all the consequences that this has on non-integrated mills (currency fluctuations, etc.). The major producers of pulp are Sweden, Finland, Canada and the United States. South America has attempted to increase its production in the past few years, while Nordic producers have continued to integrate their pulp into paper and board. Brazil and Chile should markedly raise their capacities in years to come and offer these new assets for export to the EC.

Types of pulp All pulp can be placed in one of two categories: mechanical and chemical. Mechanical pulp is manufactured by mechanically defibring or grinding wood. Producing these materials consumes less wood than chemical pulp, but needs large amounts of electrical energy, thus making it highly dependent on the cost of electricity. Recently, mechanical pulp has been further developed using processes that involve high temperatures and pressures, or the addition of chemical products, or both. Modern manufacturing processes for pressurised groundwood (PGW), thermo-mechanical pulp (TMP) and chemi-thermo mechanical pulp (CTMP) form the basis for a large part of the virgin mechanical pulp capacity. Production of these types of pulp has played its part in improving solidity characteristics in printing. Mechanical pulp is usually integrated directly into paper and board production.

Mechanical pulp is used to a large extent in publication paper. Newsprint in the EC

Table 11
Pulp, paper and board manufacturing EC external trade distribution, 1988 (% in current value)

	Importations	Exportations
EFTA	70.3	35.1
Eastern Europe	1.3	2.9
USSR	1.1	2.6
North America	20.2	16.9
Far East	1.1	7.5
South East Asia	0.5	7.0
Other countries	5.5	26.0
Total	100.0	100.0

Source: DRI

is, for example, made almost exclusively from mechanical pulp and de-inked waste paper. Uncoated and coated paper for magazines and directories use large quantities of mechanical pulp. These types of pulp are also used in varying proportions for the inner lining of folding boxboard (used for packaging) to give it volume and stiffness, and in some hygienic and sanitary products.

Chemical pulp is produced by treating wood with chemical products to dissolve the lining covering the fibres. This process, in addition to the extremely costly but essential systems, are what make chemical pulp more expensive than mechanical pulp. However, the latter has greater solidity and a superior degree of whiteness, which is necessary for the production of certain types of graphic paper. Today, chemical pulp is produced essentially using the sulphate, or 'kraft", process. The technology using this process has to be applied in large-scale production units which allow major savings to be made and make competitive pricing possible. The economic scale of a sulphate pulp mill today stands at around 300 to 400 tonnes a year, while its operation accounts for 350 to 450 million ECU. The grade of pulp used most commonly in the EC is bleached sulphate pulp (made from coniferous and deciduous wood). In 1989, it accounted for 10 million tonnes, i.e. 57% of all the pulp consumed in the EC. The proportion for bleached sulphate pulp grew during the 1980s, although it appears to have levelled off over the last few years. The import penetration level for this grade has remained at around 74%.

The other major grade of bleached chemical pulp is bleached sulphite (or bisulphite), which is made essentially from coniferous wood. While EC production has continued its slow rise, imports and total consumption have fallen. The import penetration level has slowed down, and barely exceeds 36% at present.

Consumption of mechanical pulp, after experiencing strong growth in 1988, has fallen by 9% and is down to 3.6 million tonnes. The market in pulp is international and cyclical: cycles stretch over three to five years and roughly correspond to cycles of investment (the time required by producers to react, plan and implement their new capacities). Market pulp consumers are, for these reasons, subjected to very broad fluctuations in prices and at times also in offer.

Table 12
Raw material input for paper and board production, 1988

	(thousand tonnes)	(%)
1. Woodfibre:	33 942	85,6
a. Pulp	17 018	42.9
-Integrated-EC	5 520	13.9
-Market - EC	3 458	8.7
-Net imports	8 040	20.3
b. Wastepaper	16 924	42.7
2. Inorganic fillers, coating pigments	4 600	11.6
3. Binders, other additives	1 170	2.8
Total input	39 710	100
Total output	35 011	88.2
Input/output ratio	1.14	

Source: CEPAC

Wastepaper Wastepaper is the most important household raw material in the EC and its use continues to rise in relation to all other raw materials. In theory, the EC is 100% self-sufficient in wastepaper.

Apparent consumption climbed 2.4% in 1989 to reach close on 17.3 million tonnes. This growth was encouraged by high prices charged for imported pulp and by the constant improvements in recycling technology. At the present time, wastepaper accounts for 49% of all fibrous raw material used in the manufacture of paper.

There are four main categories in which wastepaper is used:

- ordinary grades: mixed paper and board, mixed newsprint and magazine paper, unsold or sold;
- improved grades: newsprint, once-read or unsold, books, bleached paperboard, white-top carton trimmings;
- superior grades: white office waste (fromshredders), printers' trimmings;corrugating waste: corrugated boxes, which especially contain unbleached kraft pulp.

The use of wastepaper is concentrated in four paper and board production sectors: case-making materials (100% of the total use of fibres), greyboard (100%), newsprint (20 to 100%) and hygienic and sanitary articles (from 10 to 100%). Nevertheless, it is potentially possible to extend its use somewhat through more intensive treatment. All the same, this extension will depend upon how pulp prices evolve. The best perspectives for the greater use of wastepaper are reliant on the chances of replacing kraft linings and semi-chemical flutings with waste material in the manufacture of boxes. However, the progress made in the use of de-inked wastepaper in high-quality printing paper and tissue paper would have to be sustained.

High-quality ranges of wastepaper are currently being used to the full and there are precious few resources still left unused. The recovery may be envisaged of large quantities of newspapers and magazines (in households, by demanding separation at source), as well as of papers of lower quality from other sources.

Other raw materials Inorganic filler materials and both natural and synthetic binders are used extensively in paper and board production. Together, they account for 13 to 16% of the total volume of raw materials used.

Inorganic material, or pigments, have two essential functions: they enhance the printing characteristics of the paper surface and lower its cost, since they are cheaper than fibres.

Consumption of these materials has risen at a faster rate than overall paper and board consumption. This is due essentially to the heavy demand for strong publication paper, a trend which looks set to continue for a few years yet. Present consumption of materials and pigments has been estimated at 4.3 to 4.5 million tonnes. The EC's rate of self-sufficiency, which has been estimated at a current 80-85%, is set to decline slightly in years ahead.

Environmental protection

The environment has been an important consideration in the paper and board industry for a number of years. As the industry is directly tied to - and even depends upon - two natural resources, namely forestry and recycling, the sector is very concerned with future progress in the development of both forestry resources and the efficiency of recycling in the EC.

Forestry and sylviculture Most of the coniferous roundwood (i.e. a total of 22 million steres in 1989) consumed by the industry stems from the thinning necessary to maintain the health of forests.

This thinning is essential to ensure the production of trees that are healthy, of good quality and big enough in diameter for saw-milling and other wood processing sectors. Other sources of coniferous raw materials for pulp and paper production are, for example, sawmill waste, waste from plywood factories and other wood processing plants. The hardwoods used by the industry are almost entirely made up of wood which fails to measure up to the standards of saw-milling and other industries. Today, a large part of this type of raw material is made from fast-growing eucalyptus cultivated in man-made forests in Spain and Portugal. In 1988, EC consumption accounted for 20.1 million steres, of which 95% were home-produced.

In addition, the industry has been actively involved in forest management and silvicultural research for many years. A good number of the advances made in genetics, diseases and the protection of trees against pests, as well as those made in watershed management, have been backed in part or in total by the pulp and paper industry.

The Council of Ministers has agreed on a plan of mutual and strategic action in the forestry sector. The most significant progress came in 1989, with unanimous support obtained for the afforestation of farmland: this involves a programme to develop and promote the rational use of woodland in rural areas, to transform and market timber products and set up a Standing Forestry Committee and a European Forestry Information and Communication System (EFICS).

The programme is now being administered for a period of four years.

The Community has taken a series of steps to stimulate forestry activity, while new pulp and paper production plants are being built in the EC. It is important that the EC reduces its dependency on outside sources by making better use of its existing resource base, which is not exploited to the full at present. In addition, the EC should develop the potential of these resources in the medium-term.

The Community's present resources are divided more or less evenly between coniferous and hardwood species (58.6% and 41.4% respectively in 1988).

At the beginning of 1990, the Community adopted a coherent series of measures built around the following points:

the protection and development of the Community's forests within the framework of the development of rural areas and under-developed regions; the conversion and marketing of timber products; support for the afforestation of farmland.

These actions, coupled with the establishment of the necessary management tools and the co-ordination of national policies, among them the forestry information system and Permanent Forestry Committee, are the key elements in the Community strategy for the forest.

The adopted measures underpin the existing system aimed at the enhancement and structural efficiency of agriculture through:

- the introduction of an annual subsidy of ECU 150 on average per hectare during twenty years as compensation for loss of revenue suffered by farmers who afforest their farmland;
- the extension of afforestation aid to all owners of farmland;
- an improvement in aid granted in favour of forests in agriculture.

The paper industry, which absorbs nearly 50% of the EC's wood production as a consumer of, essentially, wood from thinning and sawmill waste, could reap rapid benefits from the entry into force of the forestry action programme, to which the Community is considering allocating 750 million ECU for the period from 1990 to 1993.

Recycling Half of the EC paper industry's demand for fibrous raw materials is met by recycling of paper and board products consumed in the Community, a recycling level which is in fact the best in the world.

In addition, the recovery rate is very high: over 35% in 1988, compared to around 32% at the beginning of the 1980s. The significance of this is that well over one third of all the paper and board consumed in the EC today is recovered or recycled for the paper industry. Considering that a sizable portion of all paper and board consumption is non-recyclable (books, archive documents, hygienic and sanitary papers), the real recovery rate is actually higher still and could be estimated at over 40%.

The developments of processes, chiefly in de-inking technology (the removal of ink from printed paper), have played their part in increasing usage of recycled fibres in high-quality paper and board products. EC equipment manufacturers and paper companies have been leaders in de-inking techniques for twenty years. There are many de-inking plants working throughout the Community. Most of them are integrated directly into the production of newsprint, other types of printing paper and hygienic and sanitary papers.

A large part of the materials used to manufacture boxes and, by definition, most of the greyboard consumed in the EC are made almost entirely from recycled fibres. Consumption of wastepaper in the EC paper industry continues to grow. It is highly likely that the share of wastepaper will outstrip that of pulp in the raw materials structure in a few years from now.

There are two main areas in which paper recycling has an effect on the environment. Firstly, the recycling of paper and board products removes a major component from the volume of the solid municipal waste stream. Without paper recycling, some 17 million additional tonnes of waste would have to be removed and stored using ecological means. Recycling eliminates many of the costs of collecting, removing and disposing of waste incurred by municipalities and does this without danger to the environment. Secondly, recycling is an efficient way of stretching the EC's forestry resources, since it allows more paper and board to be produced from the same limited forestry resources.

Impact of 1992

Structurally, the perspectives from 1992 should spur the rapid and widespread restructuring of the industry, already underway in the past few years within the EC. The rate at which mergers and takeovers are occurring has accelerated in the paper industry. Some of these operations involve only European industries, while other are combining EC firms with groups from outside the EC - essentially Scandinavian and North-American. This concentration of investment in plants which are large in size and profitable has developed a very pronounced trend to export to non-European countries. The overcapacity of some sectors (chiefly printing papers) has forced industry to export to overseas markets such as North America and Asia.

Outlook

1990 was characterised by a drop of around 40% in the price of market pulp, caused mainly by the simultaneous coming on-stream of several new production units. Extremely strong demand meant that the rates for paperboard remained more stable. Despite this drop in rates, the profitability of producers remained satisfactory, with the exception of groups mainly producing market pulp (Spain, Portugal, France).

On the 1993-94 horizon, the overcapacity observed in 1990 is set to worsen, influenced by the coming on stream of units already planned and a certain levelling out of growth in paper-board demand.

Projects due to get underway in 1990-91 (mainly directly integrated pulp mills) should continue to raise productivity in the

Table 13
Pulp, paper and board manufacturing
Production forecast

(million ECU, constant value 1989)

	1989	1990	1991/90	1992/90
Production	28 639	29 100	3.7%	3.5%

(1000 t)

	1989	1990	1991/90	1992/90
Paper and board	36 610	37 600	3.7%	3.7%
Market pulp	3 536	3 600	2.0%	2.0%

Source: Sema Group Management Consultants

industry. Graphic paper, as well as hygienic and sanitary papers are the areas of most new investment.

Development, both in terms of capital investment and restructuring, appears to be shifting towards the south of the Community, with France, Spain, Italy and, to a lesser degree, Italy becoming activity centres.

C.E.P.A.C.: European Confederation of Pulp, Paper and Board Industries;
Address: 1, rue Defacqz bte 20, 1050 Brussels, tel: (32 2) 534.10.10; fax: (32 2) 534.14.24
Reviewed by: Sema Group Management Consultants

Paper and board converting

In 1989, the production value of the paper board converting industry reached approximatively 40.3 billion ECU. That means an increase in production of about 8,1%, compared to the precedent year. This industry expects another increase in production for 1990 of about 6.7% which means a level of 43 billion ECU. Since 1980 the paper and board converting industry has been in expansion. Although the expansion slowed down in some branches, the production volume recorded its strongest growth rates after the announcement of the starting of negotiations for the internal market. More than 410 000 people are employed in this industry by 4 900 enterprises. The sector has a large number of small and medium sized companies. Import and export take place mainly between the Community countries and secondly with EFTA countries. The paper and board converting industry relies heavily on the paper and board manufacturing industry, but much more on the gross national product of the Community.

Definition of the sector

The paper and board converting industry within the European Community manufactures a wide variety of commodities, as for instance all kinds of packaging materials made of paper and board also in combination with plastic or metal foils, wall coverings, labels, sanitary paper products, gummed tapes and paper envelopes, exercise books, paper stationary.
Packaging materials of different kinds are the most important items, both in quantity and in value followed by household and sanitary paper goods, stationary and office supplies, and wall paper.

The proportion of the production value of the packagings made of paper and board reaches more than 40% of all packagings, but it shows a slightly downward trend.
The substitution pressure, especially by plastic, increased in the last years.
The share of production value of all packaging materials as glass, paper, board, plastic, metal, etc... in the national product of Member States might amount to about 1 to 1.5%. Much more than 80% of all paper and board packaging are already produced from recycled fibres.

Table 1
Paper and board converting
Main indicators, 1980-90

(million ECU)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990(²)
Apparent consumption (¹)	20 584	21 639	23 323	24 575	27 643	30 157	30 638	32 724	36 896	39 850	42 652
Net exports (¹)	220	211	352	505	598	733	583	468	430	497	403
Production (¹)	20 804	21 850	23 675	25 080	28 241	30 890	31 221	33 192	37 326	40 347	43 061
Employment (thousands)	439 900	414 600	396 300	388 900	386 300	381 300	374 300	384 300	401 000	412 393	N/A
Number of enterprises	5 372	5 217	5 206	5 187	5 035	4 965	4 895	4 867	4 914	N/A	N/A

(¹) 1980 EC9; 1981-85 EC10
(²) Estimated
Source: CITPA, Eurostat (Inde)

Production and consumption

In 1989, the production value of the paper board converting industry reached approximately 40.3 billion ECU. That means an increase in production of about 8.1% compared to the precedent year and of 7,7% (average annual growth rate) compared to 1980.

Apparent consumption reached in 1989, 39.8 billion ECU, representing an increase of 7.9% compared to 1988.

- Packaging products is the first branch of the sector in terms of production. It includes corrugated and solid fibre board boxes, folding cartons and folding boxes, set up and rigid boxes and paper bags, carrier bags and cornets.

Corrugated and solid fibre board boxes manufacturing are succesfully used as sturdy receptacles for transport and mailing purposes. Production climbed significantly in the last years.

In 1989 shipments reached 86 063 million square metres. That means an increase of 6.1% compared to 1988.

The corrugated board industry in the Community employs about 70 000 people in 544 enterprises. The biggest branch of packaging paper and board industry is developing in a favourable way with respect to environmental problems and to energy consumption. Corrugated board cases are recyclable and gain in the volume of box sales due to a good economic situation in the Community. In addition to shipping containers, other major end uses are packaging for consumer goods, pallets, silpsheets, prefabricated structures, pouches, tubes, sleeves etc. Corrugated products have gained substantial market share in recent years at the expense of wooden containers, pallets and other packaging materials. The average consumption of corrugated board in the Community is nearly 32 kg per capita.

The production value of corrugated and solid fibre products is projected to rise in the future. Corrugated containers will continue to show fast increases in sales, especially in the preprinted sector.

High quality, colorful printing will continue to be applied to corrugated boxes for shipping and packaging, as well as for various consumer-related products.

The second largest product group of the packaging paper and board converting industry is the folding cartons and folding box industry. Folding boxes are mainly used for sales packaging owing to its excellence as a printing medium.

In 1989 production and sales of several end-uses markets of folding cartons and boxes were expected to rise significantly. These markets include mainly the foodstuff industry, and also toys, beverage, paper goods etc.

The folding box and carton industry in the Community produced
2 592 267 t in 1989. That is an increase of 7.8% compared to 1988. The consumption per capita reached in the same year 9.7 kg. There are more than 850 enterprises in the Community to produce folding boxes and cartons with more than 51 000 employees.

A major constraint to industry sales growth over the past years has been competition with plastic alternative products, especially flexible bags and wraps and rigid carriers and containers. Corrugated boxes designed for retail displays and sale have also had some kind of negative impact on folding cartons.

These innovative packaging mediums, expanded end-use applications and also better, more attractively designed boxes have given a boost to folding cartons and boxes. Production and demand are forecasted to rise again due to policy of better environment of this industry.

Supporting the scope and effectiveness of environment legislation, the folding box and carton producers are well prepared to collect and return used paperboard boxes for recycling or for energetic uses.

Folding box carton producers have increased their market share during the last years against composite cans, drums, cares and tubes.

The production value of set-up or rigid paperboard boxes increased in the recent years too, but more moderately, after a drop period. Rigid boxes are in competition with corrugated board containers and boxes. The development of new manufacturing technologies, better quality and colorful graphics have enabled to expand into new end-use areas such as stationary and office supplies, food and beverage, chemicals and drugs and other markets previously covered by other packaging mediums. The production value of rigid boxes is estimated to rise slightly in the future.

The production value of paper bags, carrier bags and cornets increased, closely tied up to the general level of the Community business activity. During the past years sales growth have been moderate because of the competition of plastic bags and sacks. But now this industry is gaining back market shares, as plastic materials are under political and environment pressures. Efforts on the part of plastic manufacturers to develop a suitable commercial bag substitute which will safely destruct into the environment will accelerate, as several new composites are tested on a special level. In any event, demand for paper bags and sacks will continue to increase slowly over the next years.

- Household and sanitary paper goods made from cellulose cotton, tissue and crepe paper represent the second largest sector amongst paper and board goods. This product group has shown exceptionally high growth rates over the past 25 years. Cellulose wadding or webs are used in nursing and baby care and in feminine hygiene. The development of tissue paper, a smooth, soft and absorbent material that is used for handkerchiefs, facial tissue, travelling and kitchen towels and for napkins and lavatory paper has led to major growth and these items have replaced corresponding products made of other materials. The production of crepe paper has also increased sharply. This product is mainly used for hand, kitchen, car and travelling towels. However, the paper capita consumption of sanitary paper goods in the EC is still considerably lower than in the USA. Although some of its major product lines have almost reached market saturation levels and despite recent fluctuations in both industry and consumer spending, sales have remained strong in the Community.
- Stationary and office supplies are the third largest product group amongst paper and board products. In both quantity and value, production has increased at a below-average rate in the past 15 years. Account books, duplicating books are replaced by electronic data processing systems. The production of envelopes has suffered from the increased use of telephone, telex, and telefax. However, the increase in direct mailing, i.e. the mailing of bulk printed matter in envelopes as part of marketing strategy has allowed manufacturers to enjoy in the last year a better production. Although environmental protection is against plastic envelopes, this material offers a variety of advantages over paper envelopes, including water and chemical resistance, and reducing weight. These lower cost plastic envelopes will probably take over a portion of the paper envelope market, but at a moderate pace. Among the dominating products are account books, duplicating books, legal pads, notebooks, stenographic books, agendas etc.

Since 1970, the proportion of wallpaper in the production of paper goods has fallen. User-oriented novelties such as wipe-clean plastic wallpaper, easily removable vinyl wallpaper and self-adhesive wallpapers have breathed new life into the wallpaper business. Grass fibre, cork wall coverings and wood panelling provide also an alternative to wallpaper, but their high price prevents them from seriously jeopardizing wallpaper's position.

The turnover of the entire paper and board converting industry is shown in table 2.

The production of the entire paper and board industry of the European Community is still in an upward trend.

Some branches are facing strong competition, but due to flexible reaction and high quality standards the industry can still meet its customer's requirements.

In 1989 production reached approx. 40.3 billion ECU. This is an increase of 8.1% compared to the year before.

Employment and productivity

The paper and board converting industry of the Community employed in 1989 about 412 400 people in 4 914 enterprises.

As shown by table 4, employement has decreased from 439 900 in 1980 to 384 300 in 1987, increasing again in 1988 (401 000) and in 1989. West Germany and United Kingdom (around 115 000 employees in each country) represent more than 55% of the total EC employment of the sector.

Labour costs have raised tremendously during the past years, one reason beeing the shortening of weekly working hours. Conse-

Table 2
Paper and board converting
Turnover

(million ECU)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Belgique/België	766	763	795	853	948	1 112	1 212	1 353	1 486	1 591
Danmark	297	355	452	498	545	628	672	702	741	829
BR Deutschland	5 871	6 209	6 649	7 244	7 816	8 420	8 775	9 347	9 905	10 839
France	4 163	4 394	4 738	4 746	5 243	5 871	6 165	6 851	7 260	7 961
Italia	1 861	1 800	2 370	2 968	3 899	4 101	4 011	4 122	4 351	4 855
Netherlands	1 170	1 229	1 416	1 494	1 557	1 730	1 852	1 946	2 128	2 358
United Kingdom	5 743	5 835	6 511	6 624	7 184	7 893	7 323	7 714	9 197	9 462
Total	19 871	20 585	22 931	24 427	27 192	29 755	30 010	32 035	35 068	37 895

Source: CITPA.

Table 3
Paper and board converting
Production by country

(million ECU)	1980	1981	1982	1983	1984	1985	1986(1)	1987(2)	1988(3)	1989(3)	1990 (4)
EC (1)	20 804	21 850	23 675	25 080	28 241	30 890	31 221	33 192	37 326	40 347	43 061
Belgique/België/Luxembourg	666	660	697	754	831	970	1 066	1 190	1 208	1 399	1 480
Danmark	286	335	425	483	532	604	651	662	711	795	841
BR Deutschland	5 500	5 825	6 149	6 704	7 330	7 901	8 220	8 748	10 210	11 075	12 100
Hellas	199	314	211	199	224	233	252	299	295	330	349
España	1 513	1 497	1 452	1 446	1 717	1 903	1 984	1 972	2 166	2 424	2 565
France	4 024	4 287	4 607	4 622	5 113	5 687	6 013	6 646	7 120	7 808	8 187
Ireland	120	216	202	201	231	260	261	279	305	310	315
Italia	1 857	1 793	2 289	2 834	3 734	2 960	3 868	4 079	4 306	4 805	5 059
Nederland	1 011	1 153	1 240	1 308	1 430	1 601	1 698	1 751	1 916	2 122	2 245
Portugal	93	137	146	146	185	215	222	246	261	300	318
United Kingdom	5 535	5 633	6 257	6 383	6 914	7 556	6 986	7 320	8 728	8 979	9 602

(1) Estimated for Greece.
(2) Estimated for Belgium/Luxembourg, Greece and Spain.
(3) Estimated for Belgium/Luxembourg, Greece, Spain, France, Italy, the Netherlands, Portugal and United Kingdom.
(4) Estimated
Source: CITPA.

Table 4
Paper and board converting industry
Employment

(number of employees)	1980	1981	1982	1983	1984	1985	1986(1)	1987(2)	1988(3)	1989(4)
EC (1)	439 916	414 849	396 306	388 862	386 642	382 074	375 979	384 232	401 086	412 393
Belgique/België, Luxembourg	10 536	9 808	9 454	9 456	9 438	9 740	10 405	10 872	11 547	12 607
Danmark	5 187	5 147	5 987	6 053	6 374	6 996	7 367	7 404	7 400	7 688
BR Deutschland	113 012	111 363	103 842	103 199	99 502	100 342	99 061	100 587	109 495	115 000
Hellas	4 420	4 927	3 369	3 275	3 555	3 441	3 589	3 619	3 703	3 814
España	32 066	29 110	25 177	25 511	24 377	22 432	23 715	23 913	24 465	25 198
France	73 478	69 999	69 635	67 011	66 853	67 158	65 972	68 853	70 051	71 812
Ireland	4 827	4 381	3 750	3 354	3 257	3 186	3 204	3 150	3 047	3 048
Italia	30 212	20 030	33 802	34 250	36 418	36 109	33 311	34 002	34 787	35 830
Nederland	15 141	14 634	13 990	13 430	15 031	15 527	14 865	15 784	16 009	16 505
Portugal	5 633	5 987	5 883	5 920	5 942	5 817	5 747	5 980	6 105	6 288
United Kingdom	145 404	130 457	121 417	117 403	115 895	111 326	108 743	110 038	114 477	114 603

(1) Estimated for Greece.
(2) Estimated for Belgium/Luxembourg, Greece, Spain, the Netherlands and United Kingdom.
(3) Estimated for all countries excepting Denmark, FR of Germany and Ireland.
(4) Estimated for all countries excepting FR of Germany and Ireland.
Source: CITPA.

Table 5
Total labour costs per employee of the paper and board converting industry.

(ECU)	1980	1981	1982	1983	1984	1985	1986	1987
Belgique/België	16 657	17 700	17 421	18 549	19 689	21 769	21 760	21 698
Danmark	15 558	16 825	18 640	20 172	21 258	21 727	23 673	24 892
BR Deutschland	14 060	15 188	16 873	18 409	19 441	20 105	21 894	23 438
Hellas	6 312	7 936	8 638	8 366	N/A	N/A	N/A	N/A
España	8 969	9 986	10 835	10 454	11 564	12 527	12 494	13 196
France	14 626	16 059	17 342	18 064	19 087	20 867	22 123	21 231
Ireland	10 296	12 349	14 133	14 729	15 812	17 640	18 102	16 476
Italia	10 926	11 746	13 940	16 347	17 727	19 023	20 315	22 460
Nederland	16 538	18 389	21 387	23 738	21 582	21 923	22 901	23 741
Portugal	3 142	3 717	4 148	4 071	4 090	4 642	N/A	N/A
United Kingdom	10 477	12 147	14 197	14 566	15 499	16 909	16 099	13 358
Total	127 561	142 042	157 554	167 465	165 749	177 132	179 361	180 490

Source: CITPA, Eurostat (Inde)

quently losts of investments are necessary. However, in 1989 labour costs have decreased in countries such as Belgium, France, Ireland, United Kingdom, confirming a break through with the past trend. Productivity has increased from 65 000 ECU/employee in 1980, to 81 000 in 1985 and 90 000 in 1989 (expressed in constant value 1985).

Major structural features

Nearly 4 900 companies produced converting products of paper and board, also in combination with other materials at an amount of 40 347 million ECU. The number of companies decreased from 5 372 in 1980 to 4 914 in 1988. The average EC size is 80 employees by company with large national differences (64 employees in West Germany, 138 in United Kingdom). The structure of paper and board converting industry of the EC is marked by small and medium sized companies (see table 7). This indicates that product oriented and regional differences in the market for paper and board products are very pronounced. The flexibility of the smaller and medium sized business enables them to adapt quickly to changes in the market. Factories are mainly found close to the food processing industry, the capital goods industry (e.g. mechanical engineering), the chemical industry, the electrical engineering and the electronics industry, as well as to service sectors.

EC production represents around 576% of US production value and 126% of japonese one.

Investment and structural changes

In many sectors of the paper and board converting industry, traditional production processes are used, which are inexpensive and relatively unautomated. However, some sectors are more capital intensive and more highly automated: it is the case for the corrugated board and sanitary paper goods sectors.

Compared with other processing industries, the paper and board converting industry has seen above-average investment since 1980, reaching nearly 2 billion ECU

Table 6
Number of enterprises of the paper and board converting industry of the community

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Belgique/België	108	101	95	92	87	82	82	80	25
Danmark	43	44	47	46	44	51	55	58	58
BR Deutschland	1 855	1 870	1 842	1 816	1 764	1 750	1 737	1 721	1 742
Hellas	48	50	51	47	47	47	46	46	46
España	1 082	1 002	986	997	916	816	830	800	830
France	583	578	571	567	561	572	569	566	575
Ireland	41	38	38	40	38	39	39	40	41
Italia	428	411	443	480	494	502	464	470	507
Nederland	115	117	115	118	111	112	113	113	114
Portugal	143	145	152	150	150	148	147	146	140
United Kingdom	926	861	866	834	823	801	813	827	836
Total	5 372	5 217	5 206	5 187	5 035	4 965	4 895	4 867	4 914

Source: CITPA, Eurostat (Inde).

Table 7
Paper and board converting
Distribution of turnover by size of company, 1984

(%)	20-99 employees	100-499 employees	500+ employees
Belgique/België (')	29.9	52.5	17.6
Danmark	18.2	43.4	38.5
BR Deutschland	17.3	41.9	40.7
Hellas (')	21.4	37	41.7
France	22	53.1	24.9
Italia	38.1	36.3	25.5
United Kingdom	17.5	46.6	35.8

(') 1980
Source: Eurostat (Inde)

in 1989, i.e. 5% of production.

Investment has not taken place at the same time in all Member States.

In 1988-89 Germany was by far the biggest investor, with 650 million ECU or 6.6% of its turnover. Between 1980 and 1989, the most rapid growth of investment occurred in Germany, Italy, France and the United Kingdom. Investment increased in all the countries in the past two years.

The Single European Act of 1985 had a singular influence on investments, witness the fact that the industry immediately started with its preparations for the internal market.

The paper and board converting industry requires relatively few measures for the protection of the environment since it emits hardly any polluting substances. Investments are mainly directed towards purifying air emissions in coating and varnishing installations and reducing machine noise.

Research and development

Except for a few subsectors, R&D expenditure in the paper and board converting industry is relatively low and amounts to around 3% of turnover. Major efforts are being made in design and engineering, job planning, rationalisation and in addition, it is being attempted to find rapid, cheap and hygienic methods of packaging goods.

Some R&D projects are carried out jointly by the manufaacturers of paper and board converting machinery and the packaging industry.

Harmonisation of standards for processed products, machinery or types of paper and board is gaining in importance since the customer increasingly refers to uniform, comprehensive testing procedures relative to the quality of paper and board products. Small and medium-sized companies will be disadvantaged as far as observing standardisation norms or participating in standardisation panels is concerned.

The paper and board converting industry expects new ideas for standardisation from the recently formed CEN working group on paper, board and pulp, which will develop specifications for office organisations, writing and printing paper, formats and computer paper.

International trade

Until the early 1970s, paper and board products were not considered easily tradable goods. Due to their unfavourable weight/volume ratio, it is virtually impossible to transport packaging materials over long distances economically.

For corrugated board, a distance of between 250 and 500 km is considered the upper limit. Also government and other protectionist influences play an important part with trade and customs regulations in the packaging sector.

Small and medium-sized companies are often unable thoroughly to familiarise themselves with the various regulations of a

Table 8
Total of investments
within paper and board converting

(million ECU)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Belgique/België,Luxembourg	31	24	31	37	45	50	45	47	49	51
Danmark	14	16	23	21	39	41	53	59	52	55
BR Deutschland	307	351	288	349	319	376	467	588	610	650
Hellas	7	126	14	17	20	20	21	24	18	15
España	41	44	53	59	58	53	55	58	60	65
France	141	135	155	159	142	210	256	323	330	335
Ireland	7	6	4	5	5	7	5	4	6	5
Italia	93	93	114	94	165	220	214	274	280	285
Nederland	55	51	63	63	69	75	106	115	120	125
Portugal	7	11	16	10	7	8	9	10	11	15
United Kingdom	275	260	267	269	365	358	323	382	385	390
EC	978	1 117	1 028	1 083	1 234	1 418	1 554	1 884	1 921	1 991

Source: CITPA.

potential third-country customer. Intra-EC trade has, therefore, gained in importance in the past decade because of the absence of major trade barriers. Between 70 and 75% of the industry's trade movements is intra-EC, another 20% is with EFTA countries. The volume of world trade has increased almost sixfold over the past decade.

Extra-EC exports of converted products reached 2868 million Ecu in 1989 while extra-EC imports amounted to 2371 million ECU. Both followed a rather similar evolution between 1980 and 1989 and the EC external balance has remained positive. Intra-EC trade, which increased over the same period, amounted to 7 241 million ECU in 1989.

The share of exports of paper and board converting industry of the EC on the production of this industry reached 25% in 1989. The share of the exports intra-EC amounted to 18%, while the exports extra-EC reached 7% (table 9).

The imports of paper and board converted products are more or less on the same line as export. They reached the share of 24% on total production of paper and board converting industry. Thereof the imports intra-EC reached 18% and the imports extra-EC 6%.

Outlook

For the paper and board converters, the last ten years have seen the best record of prolonged growth in both volume and value of production and trade within the European Community, but also with third countries. This growth is expected to go on and 1990 will mark another year of substantial expansion of the EC paper and board converting industry.

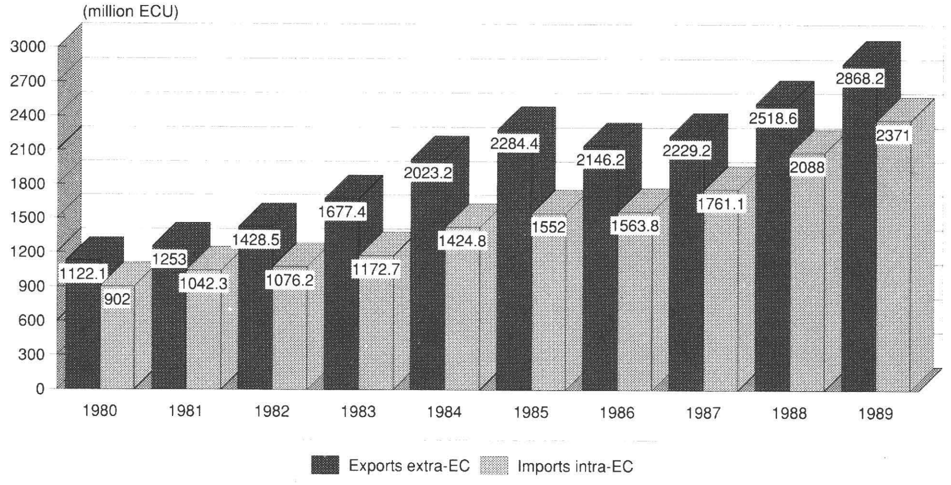
This optimistic outlook is also due to the fact that the East European countries reform their economies and stimulate the growth of their paper and board converting industry. The required investments in infrastructure, plant an equipment will lead to further demand of paper and board converted materials.

In future, most investments will be directed towards rationalisation and the maintenance of competitiveness.

The replacement of existing plants will automatically lead to an expansion in capacity. Excess capacity and imports may adversely affect production and investment activities in certain subsectors.

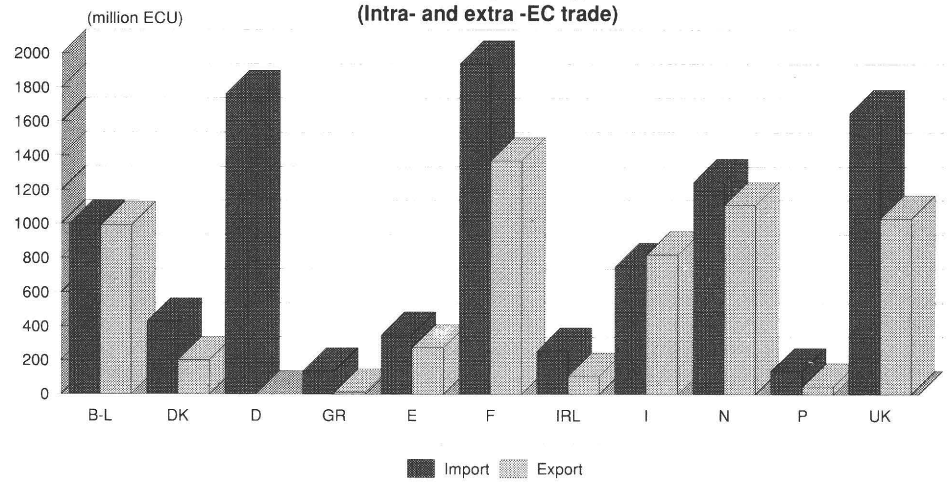
Although mass products not requiring very sophisticated production techniques, with price as the main competition impact, are increasingly being supplied by non-EC competitors, resourcefulness in product development and diversification, coupled with leadership in quality and production techniques, will guarantee further growth for the EC industry.

Figure 1
Paper and board converting
EC external trade 1980-89



Source: CITPA

Figure 2
Paper and board converting
External trade by country, 1989
(Intra- and extra -EC trade)



Source: CITPA

Table 9
Paper and board converting
Production and external trade, 1980-90

(million ECU)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990(3)
Production in current prices (1)											
EC	20 804	21 850	23 675	25 080	28 241	30 890	31 221	33 192	37 326	40 347	43 061
Index	67.3	70.7	76.6	81.2	91.4	100.0	101.1	107.5	120.8	130.6	139.4
USA	33 157	45 139	52 207	61 259	75 650	79 505	64 282	59 183	62 869	70 747	N/A
Index	41.7	56.8	65.7	77.1	95.2	100.0	80.9	74.4	79.1	89.0	N/A
Japan	11 879	16 080	16 407	19 430	22 864	22 186	24 060	24 745	29 541	31 930	N/A
Index	53.5	72.5	74.0	87.6	103.1	100.0	108.4	111.5	133.2	143.9	N/A
Production in constant prices											
EC	29 107	27 503	27 583	28 592	29 819	30 890	31 296	33 003	35 035	36 021	N/A
Index	94.2	89.0	89.3	92.6	96.5	100.0	101.3	106.8	113.4	116.6	N/A
Exports extra-EC	1 122.1	1 253.0	1 428.5	1 677.4	2 023.2	2 284.4	2 146.2	2 229.2	2 518.6	2 868.2	2 983.3
Index (2)	49.6	54.9	62.5	73.4	88.6	100.0	91.3	94.8	107.1	122.0	127.0
Imports extra-EC	902.0	1 042.3	1 076.2	1 172.7	1 424.8	1 552.0	1 563.8	1 761.1	2 088.0	2 371.0	2 579.2
Index (2)	58.9	67.2	69.3	75.6	91.8	100.0	99.0	111.5	132.2	150.1	163.0
X/M	1.24	1.20	1.33	1.43	1.42	1.47	1.37	1.27	1.21	1.21	1.15
Trade Intra-EC	2 209.0	2 548.9	2 913.0	3 243.0	3 849.9	4 386.2	4 909.2	5 441.4	5 975.5	6 861.4	N/A
Index (2)	99.6	58.1	66.4	73.9	87.8	100.0	110.0	121.9	133.9	153.7	N/A
Share of total (%)	66.3	67.0	67.1	65.9	65.6	65.8	69.6	70.9	70.3	70.2	N/A

(1) 1980 EC 9; 1981-85 EC 10.
(2) Taking into account changes in EC memberships.
(3) Estimated
Source: CITPA

Table 10
Paper and board converting
Production forecast

(million ECU)	1989	1990	1991/90 (%)	1992/91 (%)
Production in current prices	40 347	41 690	+6	+6

Source: Sema Group Management Consultant

CITPA: International Confederation of Paper and Board Converters in the European Community.
Address: Arndtstrasse 47, D-6000 Frankfurt.
Tel: 0 69/74 03 11 15; telex: 411 925;
fax: 0 69/74 77 14

Reviewed by: Sema Group Management Consultants

Printing

The printing industry is one of the Community's major industrial sectors with more than 60,000 establishments of all sizes, employing over 670,000 people - most of whom are highly trained - and turnover in excess of 57 thousand million ECU.

The Community printing industry supplies a variety of products for business and household consumption.

It is a modern, high-tech industry at the forefront of technical advance.

It does business in an extremely competitive environment not only in national markets, but also at Community level and outside the EC.

Current situation

In terms of production volumes and turnover, the printing industry has registered consistent growth. Overall, it has grown by over 7% a year for the past ten years, and grew by 10% in 1989.

The rapid rise in production seen recently stems from a large increase in productivity, which also explains the progressive, though slow reduction in employment. Past results show the vitality and capacity for change of this traditional but innovative industry.

In 1989, exports to outside the EC reached 1.4 thousand million ECU and trade between Member States 2.9 thousand million ECU. The industry itself consumed over 20 million tonnes of paper and cardboard, of which half was used for newspapers, magazines and periodicals.

Along with the publishing sector, the printing industry is essentially a provider of products mixing information, knowledge and entertainment. Therefore, its central role, strategically and politically, stems not so much from its economic scale as from its cultural, educational and intellectual vocation in democratic societies. The changes currently taking place in several Eastern European countries could offer the printing industry new and vast markets.

Consumption

Demand for printed products is dependent on several demographic and economic factors. Among the demographic elements are: population growth, household structures, school, university and training course enrolment, as well as education levels.

Despite low population growth, the number of households is still rising, as is the share of disposable income spent on information. Education and population levels and the number of managerial posts are also rising, which explains the greater need for information. All this will continue to stimulate the demand for newspapers, magazines, periodicals and, probably, books as well.

However, demand for printed products stems mainly from the printing activities of

Table 1
Printing
Main Indicators, 1980-90

(million ECU)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990(³)
Net exports (¹)	215	254	213	258	303	495	340	447	643	596	N/A
Production (²)	30 696	32 373	35 045	36 429	40 404	44 102	44 923	47 921	51 439	57 336	59056
Employment (²)	793	752	726	716	708	699	680	682	667	671	634

(¹) 1980 EC9; 1981-83 EC10; 1984-88 EC12; CN 49.01, 49.02 are not included as they also cover thepublishing industry; Nimexe 49.11.30 figures are not available before 1985
(²) Excluding Ireland; EC10: Enterprises with 20 or more employees; Spain and Portugal: All enterprises; United Kingdom: Printing and publishing combined
(³) Estimated
Source: INTERGRAF, Eurostat (Inde, Comext)
Note: these data must be considered as orders of magnitude, some Members States including in their statistics both the printing and the publishing activities

different industries and services, including government authorities. Among the economic factors to influence this demand for printed products are levels of disposable income, the growth rate for activity in the economy, the increase in the number of companies and the growth in advertising expenditure, with the latter being a particularly decisive factor. In the Federal Republic of Germany, for example, nearly two-thirds of the sector's production is related directly or indirectly to advertising, and the growth rate for advertising material is higher than the rate for printing generally, in several Community countries. Although the number of books currently being published is precedented, publishers (newspapers, magazines, books) buy less than half of what printers actually produce. Fewer than 10% of printing houses have special ties with publishers: printing and publishing tend to be carried out within the same firm. Other products such as printed packaging, advertising, forms, catalogues, etc. are all of extreme importance to printing houses.

Printed numbers of catalogues, brochures, tourist information, annual reports and business forms are consistently rising. New technology has also opened up new, expanding markets for printed products, for example computer manuals and teaching tools.

Lastly, demand is being stimulated by the development of more specific consumer-oriented marketing. Quality standards are improving, due in particular to computerized design techniques, as well as to better colour-printing equipment. Multi-coloured pictorial information is being developed for advertisements, magazines and company reports, while the majority of newspapers are also using colour inserts and web offset pre-prints.

Specialization in the sector to allow it to cater for interest segmentation has been facilitated by the reduced cost of shorter runs. The number of magazines - titles and pages -is rising. In the United Kingdom, for example, there are now close on 3,000 consumer magazines, or 50% more than ten years ago. In France, where newspaper circulations are extremely low, there are 1,300 copies of all kinds of periodicals published for every thousand inhabitants.

In Italy, circulations of periodicals are booming and printed advertising is growing by 6 to 8% a year.

However, in the business forms sector, professional printing is facing difficulties in maintaining its position, since these items are being produced increasingly by the in-house computers and laser printers of public firms and agencies.

Production

In 1989, production in the sector was estimated at over 57 thousand million ECU, representing growth of over 10% compared to 1988.

Information needs are met by an ever larger variety of electronic media and communication devices. Nevertheless, the printed word, with its characteristics of permanency and high information content, has retained its position as a convenient means of communication that is broadly accessible and efficient. In general, the replacement of printing by electronic or soft media, and even the introduction, albeit rapid, of all the more recent forms of technology, has been far slower than the predictions made ten years ago had led us to expect. Current developments in the industry reveal a close relationship between the printing sector and communication and information technology overall. Cross-fertilisation and mutual dependence are expressed by means of technology and media usage. In the past, it was possible to absorb structural changes and partial replacement without too much conflict, insofar as they came against a background of production and market growth. This expansion will probably continue in the future, although the relationship between the different communication areas will be more differentiated and steered towards greater complementation.

In this light, electronic communication should not be viewed as an activity which is alien to the printing industry, or by nature directed against it. In addition to pure printed and non-printed products, more and more "mixed information" forms of information technology will appear in a growing number of segments, that is to say mixed solutions involving both printed and electronic communication. This explains the efforts made by the printing industry in order to participate in the new forms of information technology and to diversify its industrial and commercial activities.

The printing industry has become a high-tech environment. Production processes are now mostly automated, calculated, measured and controlled by computers and microprocessors. Over these past few years, several Community countries have made large increases in the amount invested by them in printing equipment, chiefly in the following types:

- laser composition and computerised typesetting, with photo-setting as the dominant form of technology;
- computerised automated equipment to control machinery. Microprocessors are being used increasingly for ancillary control functions such as ink regulation;
- interface between printing and telecommunications in new information retrieval systems;
- use of new chemical and physical methods in the chain of activities between the input of basic material and shipment of finished products.

Particularly rapid changes have occurred in the pre-press sector, in which small printing and reproduction houses are now turning to fully electronic systems: word and image processors, electronic setting of colour images, etc... Desktop publishing offers both customers and printing houses the chance to feed computerised typesetting systems directly from floppy disks in combination with scanners. These systems also process layouts, images and diagrams. In a parallel development, major clients of the printing industry such as mail order catalogue houses have started to typeset their own documents, since this allows last minute changes and greater data security. Some printers have reacted by installing totally electronic pre-press systems capable of processing different types of data supplied by customers and of converting them into high quality print. Similarly, new pre-press systems can produce creative, innovative and cheap designs and advertising. The components of an advertisement can thus be altered speedily so as to see how they look on paper. Further down the business chain, new technology is also bringing about deep-rooted upheaval: electronic whole colour-page transmission, ink jets, computer-controlled servomechanisms, high-speed electronic automatic binding (mainly for paperbacks), polywrapping of magazines ready for shipment. Highly automated and versatile machines allow shorter print runs to be made by way of fewer changeovers and lower make-ready times. This has facilitated content specialisation, particularly in advertising, and message personalisation in the various market segments.

Although it is not a major polluting sector, printing has also pursued efforts in innovation to reduce pollution by using non-polluting materials and recycling more effluents and waste, (particularly solvents).

The progressive introduction of modern equipment since the beginning of the 1970s, at rates and degrees of intensity which differ from one country to another, has helped to reduce the fixed cost unit price. Nevertheless, this new technology has not been embraced as quickly as originally expected and has failed to cause the major disruption which many were expecting. Several factors explain this relatively slow development: the difficulties of integrating new technology into existing plants, capital limitations, the need for labour retraining, and, lastly, leaps in capacity without any corresponding demand in the immediate term.

There are only a small number of large printing equipment suppliers operating on a world scale. In 1985, the Federal Republic of Germany started up a manufacturing complex producing the world's most advanced automated printing machines. The same country continues to dominate the market for plants of all sizes, especially in sheet-fed offset equipment. Nevertheless, Japanese manufacturers have in the past few years still supplied some 60% of plants across the world in the medium format range for web offset presses, and some Japanese companies have made incursions into the Community's own market. The relative position of other countries producing large equipment has declined. This is the case, notably, in France, Italy and the United Kingdom, even though these three Member States can still boast some large and thriving manufacturers. In Italy, for example, production of large rotogravure and flexographic presses is growing rapidly. On the whole, the Community printing industry buys a considerable number of presses from America and Japan.

One Israeli firm competes actively with British, German and Japanese firms producing electronic image-processing equipment.

In general, the printing equipment sector

Table 2
Printing
The main printing machines manufacturers

Firms	Countries (million ECU)	Turnover 1989
Heidelberg	BR Deutschland	1850
Man Roland	BR Deutschland	850
Rockwell	United-States	850
Komori	Japan	285
Wifag	Switzerland	285
Koenig & Bauer	BR Deutschland	142

Source : US/L'Usine Nouvelle N°2266

is the scene of fierce international competition.

The main international printing machinery exhibitions take place in France (TGP), the United Kingdom (IPEX), Italy (GEC), Japan (IGAS) and the United States (Print-Chicago), although DRUPA in Dusseldorf is the biggest of them all. DRUPA has, moreover, been joined in Dusseldorf by IMPRINTA, which concentrates solely on the pre-press sector.

Structure of the Industry

The structure of the printing industry in the Community is characterised by a very small number of vast businesses (1,000 or more employees), a modest number of medium-sized plants (a few hundred employees) and a large number (thousands in each major industrialised country) of small businesses, most of which are family-run. There are some 10,000 printing firms in Member States like France, the Federal Republic of Germany and the United Kingdom, and some 3,000 in the Netherlands and Belgium.

In the periodical and book publishing sector, firms generally used to be family-owned. However, during the course of the last decade, large investment needs have given rise to a large number of takeovers and mergers. These have occurred not only between publishing houses (particularly in newspaper publishing), but also between the latter and other branches of the media. Some groups have become comprehensive information organisations processing information in a variety of printed and electronic forms. Most newspaper publishers and some magazine publishers have their own printing equipment. Competition between publishers and printers has increased within the major product markets. As a whole, the printing industry has not itself experienced a similar flood of mergers. Modern technology has favoured operations implying the purchase of costly equipment that only financially powerful investors can afford.

Over the same period, medium-sized and small businesses have shown astonishing vitality, stimulated in part by the reduction in costs produced by the use of versatile equipment enabling them to penetrate mar-

Table 3
Printing
Production and external trade, 1980-90

(million ECU)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990 (4)
Production in current prices											
EC (1)	30 696	32 373	35 045	36 429	40 404	44 102	44 923	47 921	51 439	57 336	N/A
Index	69.6	73.4	79.5	82.6	91.6	100.0	101.9	108.7	116.6	130.0	N/A
USA (2)	22 037	30 618	39 296	46 184	59 295	65 430	53 918	49 199	51 210	61 924	N/A
Index	33.7	46.8	60.1	70.6	90.6	100.0	82.4	75.2	78.3	98.8	N/A
Japan (2)	17 099	24 048	25 672	31 425	37 024	42 475	46 747	43 850	54 336	56 713	N/A
Index	40.3	56.6	60.4	74.0	87.2	100.0	110.1	103.2	127.9	133.5	N/A
Production in constant prices											
EC (1)	46 449	42 446	41 526	41 429	43 270	44 102	44 529	46 293	46 860	48 759	N/A
Index	105.3	96.2	94.2	93.9	98.1	100.0	101.0	105.0	106.3	110.6	N/A
Trade (3)											
Exports extra-EC	358	421	404	463	543	933	857	924	1275	1391	1 369
Index	N/A	N/A	N/A	N/A	N/A	100.0	91.9	99.1	136.7	149.1	147
Imports extra-EC	143	167	191	205	240	438	518	477	648	751	735
Index	N/A	N/A	N/A	N/A	N/A	100.0	118.2	108.8	147.9	171.5	168
X/M	2.5	2.5	2.1	2.3	2.3	2.1	1.7	1.9	2.0	1.9	1.8
Imports intra-EC	506	556	647	716	828	1674	1777	1927	2511	2859	N/A
Index	N/A	N/A	N/A	N/A	N/A	100.0	106.2	115.1	150.0	170.8	N/A

(1) Excluding Ireland; EC10: Enterprises with 20 or more employees; Spain and Portugal: All enterprises; United Kingdom: Printing and publishing combined
(2) Census of Manufactures and Eurostat estimates
(3) 1980 EC9; 1981-83 EC10; 1984-88 EC12; CN 49.01, 49.02 are not included as they also cover thepublishing industry; Nimexe 49.11.30 figures are not available before 1985
(4) Estimated
Source: INTERGRAF, Eurostat (Inde, Comext)
Note : these data must be considered as orders of magnitude, some Members States including in their statistics both the printing and the publishing activities

kets for differentiated products and services. Generally, these small businesses have computerized their production processes. For the most part, they supply smaller, loca customers or have become specialist sub-contractors.

Investment has advanced steadily. For France, Italy and the Netherlands combined, it went from 505 million ECU in 1984 to 976 million ECU in 1987. At present, a certain amount of overcapacity is visible in the European Community, mainly in the web offset sector. This affects prices and profits and is making the printing market increasingly more competitive.

Employment and Productivity

The printing industry in the Community numbered some 671,000 jobs in 1989 and in some Member States accounted for 2% of the total workforce. Around three-fifths of all employees are highly trained specialists, a much higher percentage than those found in other industries.

The EC printing industry generally experienced a sharp fall in employment in the second half of the 1970s. The situation improved during the period 1980-88, while a slight increase was recorded in 1989 for the first time in 15 years.

Over the past few years, the employment market has undergone a radical change. The future chief concern of the printing industry will be whether enough well-educated entrants can be recruited into the industry. This is a problem throughout the world, with industrialised countries outside Europe striving to attract qualified people from abroad, thus aggravating the problem for some European Community countries.

The printing industry is characterised by the high labour content of its cost structure. In the Federal Republic of Germany, where labour costs are high, they account for 36% of overall costs, whereas they account for 24% in industry in general. This situation has been fuelled by a mounting need for qualified workers and high increases in social costs. Overtime and shift work are inevitable in an industry characterized by time constraints, particularly at a time when working hours are being reduced.

Under the effects of restructuring and investment, production per employee has grown strongly over the last nine years, moving from 59,000 ECU in 1980 to 63,000 in 1985 and 73,000 ECU in 1989 (1985 constant ECU).

Training needs

The job of production manager has become one of immeasurable complexity and now requires mastery of technology and specialist fields such as finance and product marketing. These seasoned, multifaceted and creative professionals are the key elements in the cost-effectiveness, efficiency and quality of a firm's products.

The industry relies on printing colleges and institutes of technology to dispense training up to the level required by new technology. Manufacturers themselves perform an important educational role in order to fill the gap between aptitude gleaned at school or within companies and the demands of industry. They are endeavouring to cooperate with schools in order that this training be integrated into their core syllabuses.

For the employees, the switch from secondary to tertiary jobs with its radical changes has taken the place of the traditional sideways movements which used to involve minimal retraining. Training in new technology is still far from perfect.

The number of apprentices and trainees is again rising, which reflects the industry's renewed confidence in the future. In the Federal Republic of Germany and the Netherlands, for example, annual demand for qualified workers accounts for 4 to 6% of the current workforce, with slightly more entrants in the pre-press and finishing sectors, and a fall in terms of less qualified workers. In the institutes of technology and schools, specialisation is tending to decrease, giving way to training which is more broadly centred on new technology.

The printing employers' federations, in places with close trade union cooperation, have taken measures to endow the industry with a dynamic image likely to entice youngsters. Training itself has been adapted to face up to needs.

Nevertheless, as is the case in many other new technology industries, there is still a serious qualified specialist labour shortage.

External trade

The Community market is unprotected against imports from EFTA countries and offers little protection against imports from third countries. Nevertheless, with the exception of book printing, a relatively small quantity of printing business takes place outside Western Europe. Imports are mostly made up of advertising material printed abroad for large foreign clients who do not have their own in-house printing activities and who import these to support their business in the Community. However, book printers produce a substantial quantity of printing work in the Far East and Eastern Europe, as well as in North America when the exchange rate is favourable. Imports of periodicals are also

Table 4
Printing
Imports and Exports by Country, 1989

(million ECU)	Exports Intra-EC	(%)	Extra-EC	(%)	Imports Intra-EC	(%)	Extra-EC	(%)
EC	2 813	100	1 390	100	2 858	100	750	100
Belgique/België, Luxembourg	351	12	51	4	333	12	41	5
Danmark	60	2	85	6	98	3	59	8
BR Deutschland	1 006	36	558	40	328	11	221	29
Hellas (¹)	5	0	3	0	34	1	5	1
España	47	2	39	3	98	3	23	3
France	351	12	228	16	760	27	131	17
Ireland	60	2	12	1	80	3	8	1
Italia	330	12	129	9	141	5	38	5
Nederland	361	13	101	7	398	14	53	7
Portugal	6	0	3	0	31	1	4	1
United Kingdom	236	8	181	13	557	19	167	22

(¹) estimates
Source: INTERGRAF, Eurostat (Comext)

fairly important. In 1989, exports to outside the EC amounted to 1,390 million ECU, while imports remained limited to 750 million ECU in the same year. Since 1985, imports have grown faster than exports.

Trade between Member States has increased markedly, moving from ECU 506 million in 1980 to nearly 2.9 thousand million ECU in 1989 (exports within the EC are twice as high as exports to outside the EC). At present, the main competition faced by the EC printing industry is that between the Member States. The Federal Republic of Germany is the EC's biggest exporter (36% of exports within the EC, 40% of exports to outside the EC).

In the Member States of the European Community, domestic demand determines a large part of graphic product production. Export levels, i.e. the percentage of overall turnover from printing to come from exports, are generally under 10%. A look at the four biggest EC countries shows that Italy and the Federal Republic of Germany have the highest levels, that is to say 8 to 9%, whereas the export rates for France and the United Kingdom reach only 4%.

These relatively low results can be explained by the different characteristics of graphic products: the need for sustained and regular customer liaison, linguistic barriers and the high cost of transportation.

European printers export chiefly to countries in Western Europe and especially to European Community and EFTA countries which are in close geographical proximity and present no major linguistic problems. The buyers of Western printed products place relatively few orders in both the countries of Eastern Europe and further afield.

Exports particularly involve long-term, or specialist orders, for example catalogues and other printed advertising, books and periodicals produced using heliogravure. This explains why the prime movers in exports are in the main a very small number of large printing firms who use heliogravure or offset processes. It is not possible to give exact figures for external trade, nor to present figures illustrating the trade structure according to particular graphic products. External trade figures for graphic products actually fail to distinguish the business of printers from that of publishers and booksellers. This should be emphasized, since the added value generated by publishers is noticeably higher than the added value generated by printers. The external trade figures compiled by Eurostat for the graphic industry are therefore greatly overvalued, while figures which illustrate the industry's structure are in reality more of a reflection of external trade in press products and literary works, rather than of graphic products. Only a fundamental re-working of the external trade figures would allow a clearer understanding and more accurate estimate of printing's external trade.

Research and development

To a very large extent, the great technological advances made in printing have to be attributed to the research carried out by the printing industry's main suppliers - equipment manufacturers and the manufacturers of ink and paper, films, plates and other material used in the printing process. Some of the large printing and binding companies have developed equipment to meet their own production requirements, although this is still more the exception than the rule.

The German FOGRA institute of printing research, in Munich, is pursuing close qualitative co-operation with the German association of printing industries. Together, they publish a continuous stream of research work covering vast areas of practical problems linked to printing. PIRA in the United Kingdom is another important institute, examining paper, packaging and also printing. It still deals with practical and technical research, but has recently broadened its activities into technical and economic research generally financed through multi-client studies. These two institutes have contributed a great deal to the understanding and standardisation of printing processes.

The Danish graphic institute also carries out printing research on a smaller scale. However, even though paper research institutes continue to exist in France and Italy for example, printing research has generally been short of finance in most Community countries. Putting aside the British and German institutes, printing research has probably enjoyed relatively greater support in countries outside the Community such as Finland and Switzerland, where excellent institutes continue to serve industry.

Impact of 1992

A large number of major firms and some smaller firms are adapting their structures in order to be in a position to stand up to competition in a wider market. This has led to mergers and acquisitions of companies in other Community countries, as well as to more flexible forms of cross-border partnership. Some companies have shown greater interest in selling printed material to other Community countries, although this type of activity is still viewed as a means of exporting rather than as an expansion of the Internal Market.

Table 5
Printing
Production forecast 1990-92 (constant prices)

	1989	1990	91/90	92/90
Production	57 336	59 056	+3%	+4%

Source : Sema Group Management Consultants

Outlook

Forecasts for the printing industry are relatively good, on the proviso that there will be continued economic growth and greater spending on advertising in the Member States. Growth projections up until 1990 show moderate to strong growth in turnover, with the Federal Republic of Germany anticipating growth of 2 to 3%, France around 7% and the Netherlands 5 to 7%. Trends in employment will probably be variable, with some countries predicting at least marginal growth in employment, while others are anticipating a decline to reflect further restructuring and productivity gains.

In general, the industry is well placed to take advantage of opportunities for growth, given the recent investments in technology and training. However, the pressure from competing countries outside the EC will constitute a mounting challenge to this industry.

Of those factors vital to the EC printing industry's harmonious development in the medium term, the following merit particular attention:

- intensified aid for the development of specialist research & development centres which should be spread around the different Member States but work for the EC in general;
- increased cooperation between governments, institutes and training schools and firms in the sector in order to respond better to training requirements.

Written by: Intergraf: International Confederation for Printing and Allied Industries
Address: Square Marie-Louise 18, P.O. Box 25-27, B - 1040 Brussels; tel: (32 2) 230 86 46; fax: (32 2) 231 14 64

Reviewed by: Sema Group Management Consultants

Daily newspapers

Since the emergence of other forms of mass communication, daily newspapers have suffered a decline in popularity and, hence too, revenue. Television advertising in particular has partially diverted daily newspapers' main form of financial support. In a large number of countries, the weakest newspapers from a financial point of view have received public subsidies so that they can continue to operate. Clearly, recent developments as regards printing and related techniques have made a high degree of computerisation and automation inevitable. This has resulted in job losses in the manual-labour sector of what is traditionally a highly unionised industry. By contrast, the number of journalists is constantly increasing.

Press groups are increasingly seeking to europeanise their operations and expand into all areas of information, communications and advertising.

Current situation

In 1989, the daily press within the EC comprised 1,942 papers and over 72 million copies are distributed every day. This situation indicates a slight fall compared with 1986 in terms of distribution, (74 million copies distributed). By contrast, the number of titles has slightly increased (1934 in 1986).

With a few exceptions, the companies which make up this sector have shifted from the traditional family-owned firm, i.e. single proprietorship, to average or large-scale firms. This is due to the increasingly large investments needed for modernisation and automation (a printing machine for example, costs approximately 16 million ECU), and the fact that a certain level of circulation is vital in order to achieve economies of scale.

In recent years the leading publishing groups such as the Axel Springer Group in West Germany have strengthened their position; Mirror Group Newspapers Ltd, News International PLC, Associated Newspapers Group in the United Kingdom; Hersant in France; Fiat-Gemini-Rizzoli in Italy. These groups have all diversified into multi-media and are highly active in the written press (dailies and periodicals).

The sector's revenue depends on two main factors: the number of copies sold and the take-up of advertising space. Advertising revenue accounts for between 16%

Table 1
Daily newspapers
Main indicators

(thousands)	1982[1][2]	1986	1989
Apparent consumption (tonnes)	4 250	4 937	5 685
Production	72 263	74 262	72 578
Employment [3]	234	227	211

[1] Apparent consumption - EC10
[2] Production, EC9
[3] CAEJ estimates
Source: CAEJ

enable one to form a more accurate picture of the situation, because the price of paper differs from one Member State to the next.

Overall, EC consumption has grown (15% between 1986 and 1989) but there are significant disparities between individual countries. West Germany and the United Kingdom alone account for 60% of EC consumption.

(Greece) and 72% (Denmark) of the sector's revenue. The average figure for the EC is approximately 30%, compared with around 80% in the United States. The size of the print-run for daily papers differs widely from one Member State to the next. The United Kingdom and West Germany account for 30% and 28% respectively of the total number of copies distributed in the EC, followed by France with 12% and Italy with 9%.

The reading level of daily newspapers, which is determined by the size of circulation in relation to the population, is linked to the reading level in general. A distinction can be drawn between Member States in Northern Europe, such as the United Kingdom, West Germany and the Netherlands, where the reading level for daily newspapers is between 300 and 400 copies per 1,000 inhabitants, and Southern Europe, such as Italy, Spain, Portugal and Greece, where the ratio is approximately 100 per 1,000 inhabitants.

The principal daily newspapers in each member country are listed in table 3. The leading daily in West Germany, Bild Zeitung, alone accounts for 25% of the total number of dailies distributed in that country. In the United Kingdom, the two leading dailies, the Sun and the Daily Mirror represent 19% and 15% respectively.

Production and consumption

Table 4 indicates consumption in term of tonnes rather than value. These statistics

Between 1986 and 1989, although the number of newspapers declined slightly in Belgium, West Germany, Greece and the Netherlands, elsewhere it increased. On the advertising market, newspapers are in direct competition with other media. Television advertising is one of the main competitors of the written press and its share is steadily increasing. The emergence of a new advertising medium has inevitably changed the way in which advertising expenditure is distributed among the traditional media. The introduction of commercial television channels has reinforced this trend.

In addition, we are now seeing an expansion in the freesheet press as well as in-

Table 2
Daily newspapers
Daily production

	Number of newspapers			Circulation		
(thousands)	1982	1986	1989	1982	1986	1989
EC	1 633	1 934	1 942	72 263	74 262	72 578
Belgique/België	38	36	35	2 259	2 180	1 713
Danmark	46	46	46	1 821	1 837	1 828
BR Deutschland	1 202	1 273	1 260[1]	25 538	20 918	20 500
Hellas	N/A	129	103	N/A	1 321	1 577
España	N/A	102	110	N/A	3 005	3 000
France	101	88	107	10 899	9 886	8 882
Ireland	5	5	12	650	555	1 566
Italia	88	78	83	7 490	8 378	6 706
Luxembourg	4	4	4	110	115	115
Nederland	48	48	45[2]	4 562	4 527	4 592
Portugal	N/A	25	28	N/A	420	450
United Kingdom	101	100	109	18 934	21 120	21 649

[1] Including the titles of second editions.
[2] Independant newspapers.
Source: CAEJ

creased penetration by non-media forms of advertising (direct marketing, sales promotion).

As a result, the daily press in most EC countries has seen its market share of advertising diminish. Between 1982 and 1989, the proportion of newspaper advertising revenue in relation to all forms of advertising revenue combined declined in every country. In 1989, it accounted for between 16 and 72% of the total, depending on the country, i.e.:

- over 30% in the case of West Germany, Denmark, Ireland and the Netherlands;
- less than 30% in the case of Belgium, Greece, Spain, France, Italy, Portugal and the United Kingdom.

Those Member States which suffered a sharp decline in newspaper advertising revenue (over 30% between 1982 and 1989) are Belgium, Greece, Ireland and the United Kingdom.

In a number of Member States, radio and television stations protected by a State monopoly have been granted permission to increase their volume of advertising; however advertising intended for mass distribution is not yet permitted on television.

Table 3
The main daily newspapers in the EC

Countrie	National circulation (thousands)	Main daily	Circulation newspapers (thousands)
Belgique	1 713	Standaard	382
		Laaste niews	291
		Le soir	200
BR Deutschland	20 500	Bild Zeitung	5 100
Hellas	1 517	Ta Nea	150
		Ethnos	155
España	3 000	El pais	440
		ABC	250
France	8 882	Le Figaro	430
		Le Parisien	400
		Le Monde	360
Italia	6706	Corriere della sera	900
		La Repubblica	830
Nederland	4 592	De Telegraaf	720
Portugal	450	Correio de Manha	70
		Jornal de Noticias	70
United Kingdom	21 649	Daily Mirror	3 200
		The Sun	4 200

Source: SEMA

Technology

The daily press has invested considerable sums in an effort to modernise its production techniques: composition rooms, editorial offices, dispatching departments and rotary press rooms have all undergone major changes in processes and are now controlled by computers and micro-processors. Automation is spreading to every aspect of the business, from editing systems (word and image processing, electronic composition, computerised transmission of texts, printing) to data storage and distribution systems. The transmission of images and photographs via satellite, the development of high-performance printing processes such as flexographic printing and the use of digital scanners have all become accessible to the daily press over the past few years. Thanks to the various investments made, the daily press should be able to offer its readers and advertisers an excellent standard of printing and high editorial quality.

Employment levels

Between 1986 and 1989, the number of people employed declined slightly (by 16,000) to reach 211,284 jobs in 1989. This reduction has affected every country and is most pronounced in the manual-labour sector where the root cause is the computerisation of printing techniques and the introduction of new technologies for storing and distributing information. Conversely, the proportion of journalists in rela-

Table 4
Daily newspapers
Consumption of paper

(thousand tonnes)	1982	1986	1989
EC	4 250	4 937	5 686
Belgique/België	196	194	162
Danmark	165	189	152
BR Deutschland	1 287	1 448	1 545
Hellas	54	85	92
España	N/A	267	358
France	569	499	480
Ireland	35	30	52
Italia	315	366	504
Luxembourg	8	8	9
Nederland	381	463	494
Portugal	N/A	38	38
United Kingdom	1 240	1 350	1 800

Source: CAEJ

Table 5
Percentage of advertising expenditure in the daily press

(%)	1982	1986	1988
Belgique/België	32.4	28.3	21.1
Danmark	89.2	89.2	71.8
BR Deutschland	41.8	37.9	38.4
Hellas	25.9	15.3	15.8
España	30.1	33.8	27.4
France	27.1	20.3	19.3
Ireland	52.6	30.6	33.9
Italia	25.4	19.5	20.8
Nederland	42	39.7	37.3
Portugal	28.6	28.4	21.4
United Kingdom	34.3	31.4	24.6

Source: CAEJ

tion to the total number of people employed increased from 19.1% in 1986 to 21.8% in 1989.

Outlook

Daily newspapers are well aware that continuous efforts are required in a number of key sectors, the main one being editorial content. The increase in the number of journalists indicates that newspapers have invested in this area. Many newspapers have also carried out readership surveys in order to gain a better understanding of rapidly changing life-styles and tastes.

Quality of presentation is another major factor in the industry's development; newspapers now have considerably more scope thanks to the growing use of colour as well as the introduction of more varied forms of visual presentation. All of these improvements enable newspapers to compete on equal terms with the audiovisual industry, by attaching greater importance to explanation and analysis.

Many publishers are also aware of the importance of diversification. The primary aim of newspaper publishers is to disseminate information and opinions. Past experience has prompted newspaper publishers and editorial teams to expand into various areas of information. Investments have been made in the economic and financial daily press, in the periodical press and regional publishing. Certain press groups are also taking an interest in the electronic transmission and distribution of their data, particularly the economic and financial press.

The press is now having to cope with the constraints imposed by environmental concerns: this means helping to find solutions aimed at promoting the recycling of newspapers. Printing works, for their part, have continued to seek innovative solutions designed to reduce pollution through the use of non-pollutant materials and the recycling of effluent and waste.

In future, we can expect to see more rapid moves towards more concentrated ownership of the press and media, together with the emergence of very large information and communications groups. Mondadori, for example, the leading Italian press and publishing group, is currently proving an attractive target for the Carlo de Benedetti and Silvio Berlusconi groups; Hersant (France) is acquiring holdings in Spain; Mondadori (Italy) and Prisa (Spain) are acquiring stakes in Newspapers Publishing (United Kingdom). The economic

Table 6
Daily newspapers
Employment in 1986 and 1989

	1986				1989			
	Journalists	Manual labour	Admin. person.	Total	Journalists	Manual labour	Admin. person.	Total (1)
Belgique/België	1 045	2 499	2 025	5 569	1 131	2 313	2 312	5 756
Danmark	1 970	5 700	4 600	12 270	2 537	3 230	3 231	8 998
BR Deutschland	11 173	25 560	35 901	72 634	10 261	24 942	32 746	67 949
Hellas	1 711	2 005(2)	N/A	3 716	2 150	750	830	3 730
España	2 560	5 089	2 222	9 871	2 486	4 985	2 154	9 625
France	4 870	9 570	6 090	20 530	10 000	14 500	14 000	38 500
Ireland	503	738	1 012	2 253	612	1 242	870	2 724
Italia	4 077	12 576(2)	N/A	16 653	4 883	6 257	6 361	17 501
Luxembourg	60	500(2)	N/A	560	60	500 (2)	N/A	560
Nederland	3 061	4 222	6 421	13 704	3 250	4 200	6 950	14 400
Portugal	400	3 200(2)	N/A	3 600	600	2 941 (2)	N/A	3 541
United Kingdom	12 000	35 600	18 200	65 800	8 200	12 200	17 600	38 000
Total	43 430	107 259	76 471	227 160	46 170	78 060	87 054	211 284

(1) United Kingdom - Regional daily press only.
(2) includes both manual and administrative employees
Source: CAEJ

daily press is also becoming increasingly internationalised. In 1990 Ponex SA (l'Expansion, Vie française, la Tribune) acquired three new shareholders: the American firm Dow Jones (Wall Street Journal), the Spanish firm Prima (El pais, Cinco dias) and the German firm Handelsblatt (Handelsblatt). 1990 also saw the creation of their European information network Eurexpansion.

As far as newspaper advertising is concerned, no significant changes are expected on the national markets. Moves towards greater harmonisation, however, are expected in the following areas:

- the economic and fiscal regulations governing the press (VAT rate in particular);
- legislation on concentration thresholds (maximum level of press control) which still differ widely from one country to the next;
- distribution systems.

CAEJ: Communauté des associations d'éditeurs de journaux de la CEE Address: rue Belliard 20, boîte 5, B-1040 Brussels; tel: (32 2) 512 17 32 fax: (32 2) 512.74 58

Revised by: Sema Group Management Consultants

The periodical press in the Community comprises more than 20 000 publications. Publishers include major international groups (Bertelsmann, Hachette etc.) as well as family owned SMEs where the shareholding is divided between a number of founders.
In most countries of the Community there is a tendency to concentrate the ownership of titles. This is due to insufficient capitalisation of the SMEs as regards the necessary investments in computer technology or the promotion of new titles as well as the nature of the advertising market.

Description of the sector

The periodical press covers the fields of business and the professions, science and technology, leisure, life-style, culture and politics - in other words all main areas of knowledge and opinion.

As well as this diversity of content there is also considerable variation in periodicity (weekly, bi- or tri-weekly, semi-monthly, monthly, quarterly, or biannual) and in the physical characteristics of the product; magazine quality print, newspaper quality, newsletter etc.

This polymorphous situation makes a statistical approach to the periodical press at Community level difficult.

The sector combines various criteria which vary as a function of content, periodic or volume of publicity, and is defined by each member State in its own way. Some count the "editorial" press and the associated or group press as a single entity, while others only take account of the "editorial" press. In fact, to date there exists no proper definition of the periodical press at Community level.

Current situation

Advertising accounts for more than 40% of the revenues of titles in France, more than 50% in Germany and Belgium, and 75% in the U.K. In Italy and in Portugal advertising represents only a third of the total turnover of the periodical press. In certain countries, competition from television in the advertising market is particularly strong, especially where the progress of deregulation of the audiovisual sector is advanced, as is the case in Italy. The same tendency is also found in Portugal, but for the opposite reason, given that it has the lowest costs in the EC for television advertising space.

It should also be noted that the magazine press for the mass market seems particularly vulnerable to this audiovisual competition, while on the other hand, the technical and professional press benefits from the growth in advertising expenditure observed in most countries. For a large number of titles in the mass market periodical press a new form of competition has recently appeared from the daily newspapers in their subject-oriented or spe-

Table 1
Periodicals
Summary table, 1986

	Number of Titles	Total million ECU	Turnover Advertising (%)
Belgique/België (1)	395	391	50
BR Deutschland	6 908	5 312	55
France	2 378	3 837	41
Italia	3 312	1 992	32
Nederland (2)	450	N/A	N/A
Portugal (3)	1 100	42	N/A
United Kingdom	5 600	2 222	75

(1) Figures are for 1987; Restricted coverage - Federation National des Hebdomadaires d'Information and Union des Editeurs de la Presse Periodique
(2) Restricted coverage - NOTU (business press only)
(3) Number of titles covers the entire Portugese press
Source: FAEP

cialised supplements. To prevent the further erosion of their sales and the growing of preponderance of periodicals in recent decades, a number of daily papers have magazine products which are distributed with the newspaper, and allow for a better response to the interests of their readers as well as the satisfaction of the quality demands of their advertisers.

This specialisation trend, which appears to be the most suitable means for protecting the written press from the competition of audiovisual media, is for that matter general: for the most part, new titles are now created around a segment of readerships and specialised contents, most often conditioned by the existence of a sufficient number of potential advertisers.

This increasing specialisation is an essential part of the strong average growth registered for the periodical press.

Finally a further tendency has been observed recently in the magazine sector: the internationalisation of titles. However the internationalisation is only rarely by literal exportation. The most important groups mainly develop international publications on the basis of their national products, and usually adapt them to each target country.

Within the press sector the professional press appears to be the one with the most potential especially in the Netherlands, United Kingdom and Germany where it is already highly developed.

Most of the large press groups have activities in other communication fields (daily newspapers, television, exhibitions and fairs) and are currently leading players in the numerous movements in concentration-internationalisation.

Table 2
Periodicals
Leading printing companies: Turnover
(million ECU)

Companies	Countries	Sales
Dai Nippon Printing	Japan	5 913
Time Warner	USA	5 726
Toppan Printing	Japan	5 407
Bertelsmann	BRD	5 033
News Corp.	Australia	4 835
Thomson Corp.	Canada	3 830
Hachette	France	3 451
Gannett	USA	2 640
Times Mirror	USA	2 635
R.R Donnelly	USA	2 344
Moore	Canada	2 061
Reed International	United Kingdom	2 060

Source: Fortune

FAEP: Federation des associations d'editeurs de periodiques de la CE.
Address: avenue Livingstone 26, Boîte 3, B-1040 Bruxelles; tel: (32 2) 231 12 99

Revised by: Sema Group Management Consultants