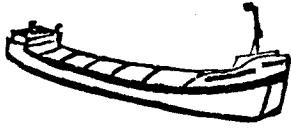


EUROPEAN COMMUNITIES

# EUROPA TRANSPORT



OBSERVATION OF TRANSPORT MARKETS

# ANALYSIS AND FORECASTS 1982



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# **ANALYSIS AND FORECASTS**

## **1982**

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# C O N T E N T S

	<u>Page</u>
Introduction	5
<u>PART I: OVERALL OUTLOOK</u>	7
1. General trends in transport activity	8
2. Energy and transport	12
3. The longer-term path along which the transport sector is moving: The structural changes affecting transport activity	13
A. General overview	13
B. Effects on the transport of specific categories of goods	14
C. Changes in total transport by mode	15
D. Changes in transport demand and transport activity by country to country relation	19
4. Geographical structure of the transport flows for the different modes	23
<u>PART II: CARRIAGE OF CERTAIN MAJOR CATEGORIES OF GOODS</u>	29
1. Carriage of NST 0 goods	30
2. Carriage of NST 1 goods	32
3. Carriage of NST 2 goods	35
4. Carriage of NST 3 goods	38
5. Carriage of NST 4 goods	41
6. Carriage of NST 5 goods	44
7. Carriage of NST 6 goods	47
8. Carriage of NST 7 goods	50
9. Carriage of NST 8 goods	52
10. Carriage of NST 9 goods	54
<u>STATISTICAL ANNEX</u>	57



## I N T R O D U C T I O N

"Analysis and Forecasts 1982" for freight transport between Member States is part of the economic analysis undertaken by the Commission services in the Market Observation System. The preliminary forecasts for 1982 were prepared by the Institut für Wirtschaftsforschung in Munich, and were revised and updated by the Commission services after consulting with Member State experts.

This text is one of three regular publications reporting the results of the Market Observation System. Companion publications are:

- Market Developments: a quarterly update of developments in transport trends (activity, utilisation of capacity, investment, employment and cash flow); traffic flows for road, rail and inland waterways; and reports and commentary on price and cost movements.
  
- Annual Report: a comprehensive analysis of current developments in freight traffic by road and inland waterways between Member States. (Publication date: September 1982).



Part I

OVERALL OUTLOOK



## I. GENERAL TRENDS IN TRANSPORT ACTIVITY

For the year 1981, total transport activity (intra-European border crossing transport) in the EUR-9\* is expected to have fallen by 2.7%. For 1982, a positive growth rate of 0.5% has been forecasted.

After two years of negative growth (1980 and 1981), the positive growth rate for 1982 reflects the slight upturn in the business cycle which started in the second half of 1981 (after twelve months of negative growth). However, considerable uncertainty about the level of transport activity exists, due to the general concern regarding the overall economic situation in the Community.

For these reasons, there is not much room for optimism. Due to structural changes, the high growth rates from the past cannot be expected to be realized again. The changes in 1982 will also be different for each of the three modes in this report.

The forecasted change in international transport demand should be seen in the context of economic growth during the years 1981 and 1982. Starting assumptions on the economic environment of the transport sector are derived from short-term macro-economic forecasts. The latest available, updated by all the information available at the time of writing this report, assume a Gross Domestic Product growth of - 0.8% (1981) and + 1.2% (1982).

Due to a sharp decline in employment, real incomes have fallen in 1981 and, with a roughly constant savings ratio, consumer spending has decreased (- 0.6%).

Similarly, because of a combination of high interest rates and weak demand, investment activity in the European economy has been falling (- 4.0%) and stockbuilding has been negative. The only domestic component showing a positive growth rate is government spending (+ 1.5%). EC-exports of goods became more competitive, one of the reasons being the appreciation of the dollar. Export growth has been estimated at 2.0% in 1981, with imports falling at - 3.7%.

---

\*Greece is not included in this report.

For the year 1982, one can expect a moderate increase in real household income, which, together with a slight drop in the savings ratio, will have a positive effect on consumer spending. Investment growth will remain slightly negative, although increasing on a quarterly basis. Recovery in stockbuilding will add to domestic demand. Imports of goods will rise due to higher domestic demand.

In Table 1 total transport activity (both in growth rates and in levels) is shown:

TABLE 1: TOTAL TRANSPORT ACTIVITY

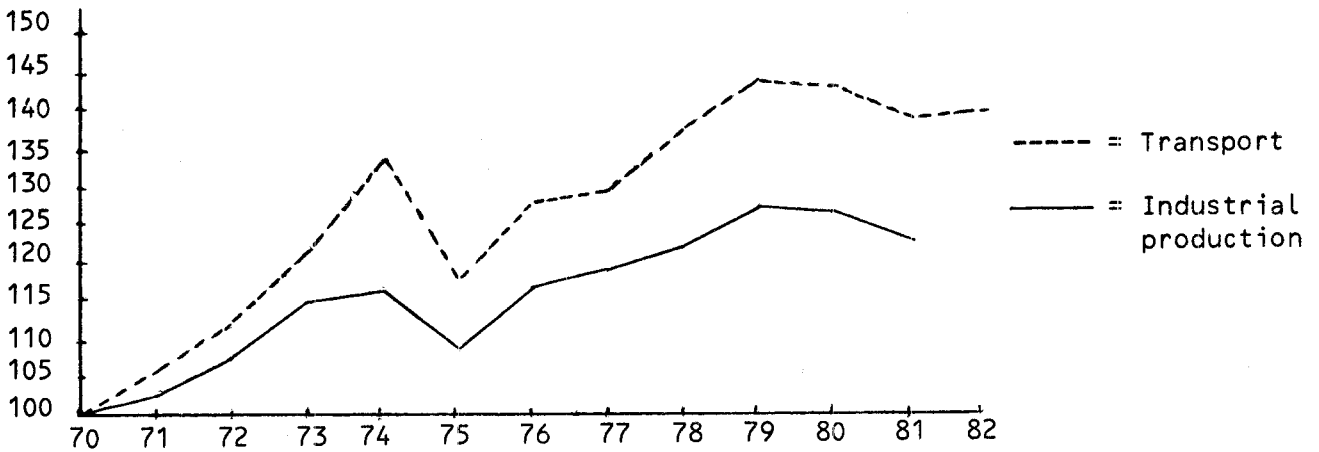
	<u>Annual Growth Rate</u>	<u>Total Tonnage</u> (million T)
<u>1978</u>	+ 6.4%	414.5
<u>1979</u>	+ 4.7%	432.9
<u>1980</u>	- 0.4%	431.5
<u>1981</u>	- 2.7%	420.0
<u>1982</u>	+ 0.5%	422.2

This increase is caused by several factors, influencing growth in an opposite sense:

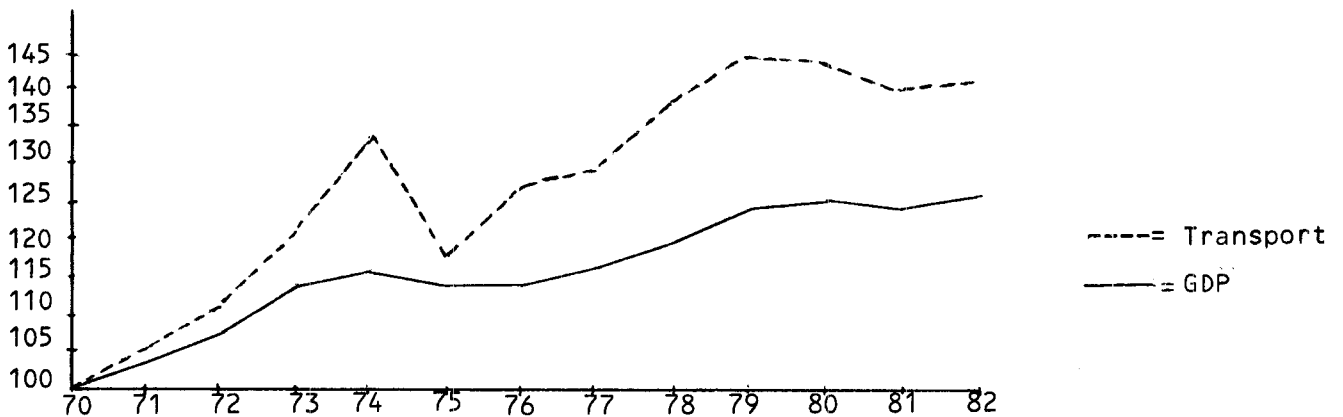
- (a) some upturn in the economies of the Member States
- (b) the crisis in the steel sector
- (c) a low activity level in the construction industry.

In the following graphs (Graph 1 and Graph 2), a comparison is made between freight transport between EC Member States, Gross Domestic Product at constant market prices and industrial production in volume.

**GRAPH 1: GDP AND TRANSPORT**



**GRAPH 2: INDUSTRIAL PRODUCTION AND TRANSPORT**



The graphs indicate that over the time period that is analysed, total tonnage transported has increased more rapidly than GDP and industrial production. The average growth rate of industrial production is lower than that of GDP, but the changes in the growth rate of industrial production are closer to those in the growth of transport. In the following table, growth rates are given for total tonnage transported, GDP and industrial production:

TABLE 2:

<u>Year</u>	<u>Total Tonnage Transported</u>	<u>GDP</u>	<u>Industrial Production</u>
<u>1971</u>	5.5%	3.5%	1.7%
<u>1972</u>	5.3%	4.0%	4.7%
<u>1973</u>	8.7%	5.9%	7.8%
<u>1974</u>	10.3%	1.7%	0.6%
<u>1975</u>	- 11.5%	- 1.4%	- 6.6%
<u>1976</u>	8.2%	5.0%	7.4%
<u>1977</u>	1.5%	2.3%	2.4%
<u>1978</u>	6.4%	3.0%	2.4%
<u>1979</u>	4.7%	3.4%	4.9%
<u>1980</u>	- 0.3%	1.4%	- 0.9%
<u>1981</u>	- 2.7%	- 0.8%	- 2.8%
<u>1982</u>	0.5%	1.2%	-
	$\bar{X}^* = 3.2$	$\bar{X} = 2.4$	$\bar{X} = 2.0$
	$\sigma^* = 4.8$	$\sigma = 2.1$	$\sigma = 4.1$

Although the standard deviation of the growth rates of total tonnage transported and industrial production are very close, the average growth rate is higher for total tonnage transported than for industrial production. Essentially this trend is due to the growing importance of exports and imports as components of Gross Domestic Demand. Table 3 notes this development.

---

$\bar{X}$  = the arithmetic mean.

$\sigma$  = the standard deviation.

TABLE 3: SHARE OF EXPORTS AND IMPORTS OF GOODS IN GDP (EUR-10)

(CURRENT PRICES)

	<u>Exports</u>	<u>Imports</u>
<u>1960-1969</u>	16.1%	17.4%
<u>1970-1979</u>	21.0%	21.9%
<u>1980</u>	23.9%	26.3%
<u>1981</u>	24.5%	25.3%
<u>1982</u>	25.7%	26.3%

Source: National accounts ESA and Economic Budgets, October 1981.

## II. ENERGY AND TRANSPORT

Energy consumption in the transport sector has continued to increase since the 1973 oil crisis, but at a slower pace, reflecting a more efficient use of energy in the freight transport sector.

<u>Year</u>	<u>Average Annual Increase</u>
1973-1978	2.8%
1963-1973	5.4%

The relative part which energy consumption in transport plays in total consumption has risen from 15% in 1973 to 18.3% in 1978. Transport accounted for 35.4% of total oil consumption in 1978.

TABLE 4: ENERGY CONSUMPTION OF THE TRANSPORT SECTOR (EUR-9)

(IN TEP)\*

<u>Year</u>	<u>Total Energy Consumption</u>	<u>Energy consumption of the transport sector as % of total</u>
<u>1965</u>	536.2	15.2
<u>1970</u>	681.9	15.4
<u>1975</u>	713.1	17.3
<u>1977</u>	750.7	18.0
<u>1978</u>	778.2	18.3
<u>1979</u>	812.0	18.2

Increasing oil prices have a negative impact on economic growth and consequently also on transport demand. Higher energy costs tend to have a negative effect on road transport and favour rail and inland waterways. To measure the complete effect of the international changes, other factors have to be taken into account also, such as changes in the international distribution of labour, structural changes in the production of products and the production processes, government policy (especially in relation to energy), and last but not least the flexibility of each mode, allowing them to react in a different way to changed market conditions.

### III. THE LONGER-TERM PATH ALONG WHICH THE TRANSPORT SECTOR IS MOVING: THE STRUCTURAL CHANGES AFFECTING TRANSPORT ACTIVITY

#### A. General Overview

While this report is primarily concerned with preparing forecasts for 1982, it is useful to recall that developments in 1982 will be influenced by on-going changes in the structure of the Community's economies. These

\*TEP: tonne equivalent petroleum.

structural changes are influenced by a number of key factors:

- energy costs
- changing patterns of world production of steel, and
- the distribution of production centres for other basic raw materials and manufactured products.

Developments in these areas will, therefore, change the present patterns of trade and transport flows. The net result on the terms of trade\* will influence the structure in European exports and imports. Changes in productivity rates between different parts of the world economy will, in many cases, compound the influences of the factors mentioned above.

The year-to-year impact of these changes may, indeed, in numerical terms, be small, but their cumulative effect is beginning to be noticed in the transport sector. Consequently, the expected out-turn for 1982 is influenced both by the business cycle and by these longer-term trends.

#### B. Effects on the transport of specific categories of goods

In the coming years, growth will decline in the industries which are using heavy raw materials as inputs, i.e. in the iron and steel industry, oil refining, the paper industry and the building material industry. In other sectors, the production level will stabilize (e.g. textile, glass).

---

\*Terms-of-trade: the quantity of purchases for which a given quantity of sales will exchange. Usually an index number measuring changes in the terms-of-trade obtained by dividing an index number of prices of sales by one of the prices of purchases; a rise indicates an improvement and vice versa.

From the point of view of the subdivision of goods in NST-classes, one can safely assume that the relative importance of NST 9 will increase year by year.

Since the value per unit of weight will be higher than in the case of bulk transport, the fraction of transport cost in the total cost structure will diminish, even if the transport cost rises more rapidly than before.

C. Changes in total transport by mode

Growth rates are different for the three modes of transport. The growth rate for railways shows the lowest of all modes in 1981, and in 1982 (see Table 5). Inland waterway transport in 1982 remains constant. Those short-term changes do not offset the longer term trend of road transport to increase its share in total transport.

TABLE 5: TOTAL TONNAGE TRANSPORTED (MILLION TONNES)

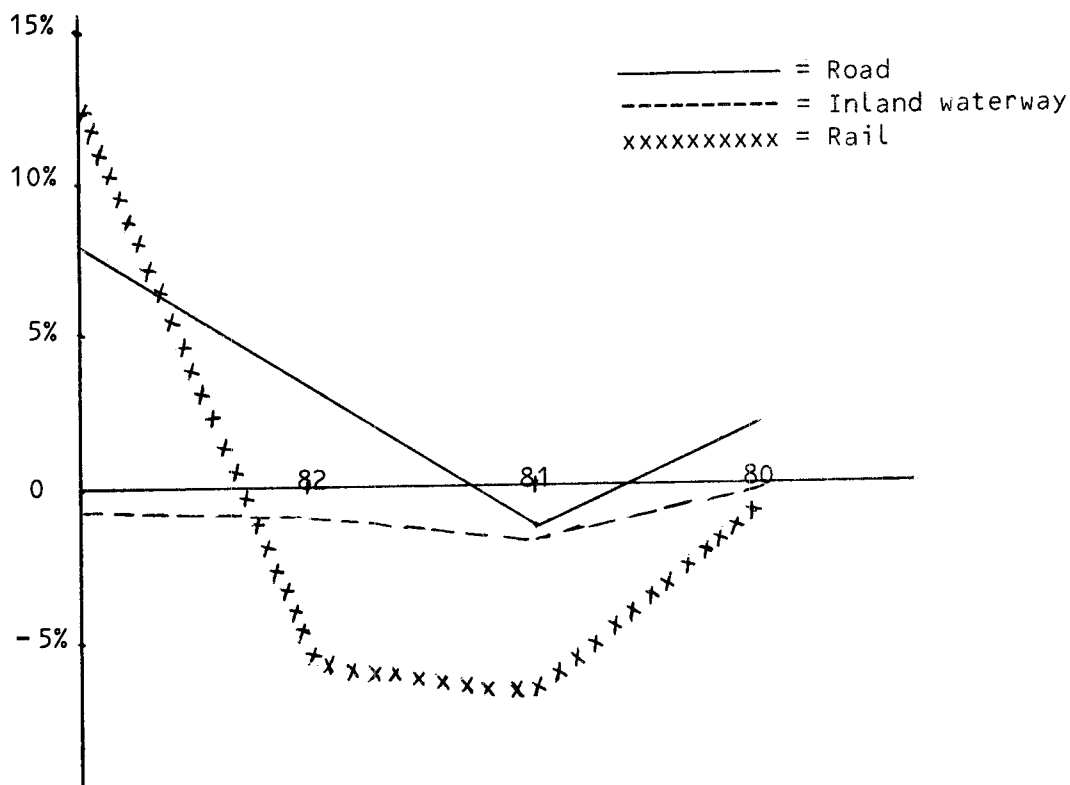
	(GROWTH RATES IN BRACKETS)			
	<u>1979</u>	<u>1980</u>	<u>1981*</u>	<u>1982**</u>
<u>Road</u>	162.2 (8.0%)	167.0 (3.0%)	164.8(-1.3%)	167.9 (1.9%)
<u>Waterway</u>	190.7 (-0.8%)	189.1 (-0.9%)	185.1(-2.1%)	184.9(-0.1%)
<u>Rail</u>	80.0 (12.8%)	75.4 (-5.7%)	70.1(-7.0%)	69.5(-1.0%)
<u>Total</u>	432.9 (4.7%)	431.5 (-0.3%)	420.0(-2.7%)	422.2(0.5%)

\* 1981: estimate.

\*\* 1982: forecast.



**GRAPH 3: CHANGES IN TOTAL TONNAGE TRANSPORTED BY ROAD, WATERWAY AND RAIL  
(ANNUAL GROWTH RATES)**



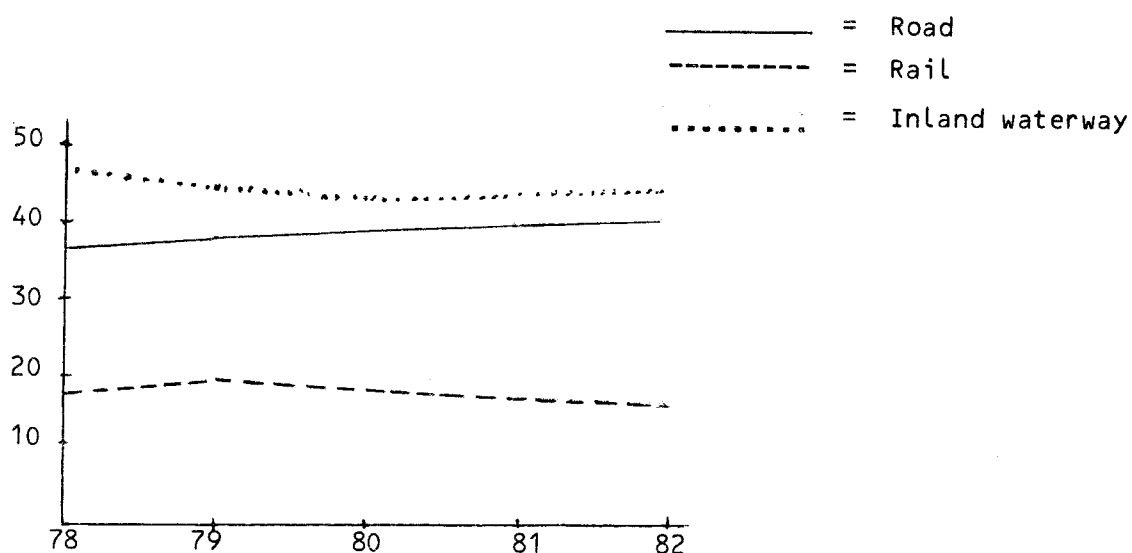
The changes that took place in the modal split over the recent years, including 1981 and 1982, are shown in Table 6 and Graph 4.

**TABLE 6: MODAL SPLIT**

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u> <sup>*</sup>	<u>1982</u> <sup>**</sup>
<u>Road</u>	36.5	37.0	38.7	39.2	40.0
<u>Waterway</u>	46.4	44.4	43.8	44.1	44.0
<u>Rail</u>	17.1	18.6	17.5	16.7	16.0
<u>Total</u>	100.0	100.0	100.0	100.0	100.0

\* 1981: estimate.  
\*\* 1982: forecast.

GRAPH 4: MODAL SPLIT



The trend towards an increasing share of road transport is, as has already been explained, a consequence of specific structural changes that are taking place. It also reflects that in the recession years some branches of industry were more severely hit than others. In other words, the goods carried by road transport seem to be less sensitive to recession than the goods carried by the other two modes.

Transport by rail was hit in the first instance by the crisis in the European steel sector; transport by inland waterway in its turn was hit by the recession in the building industry (fall in public investment due to budgetary squeeze, fall in investment in dwellings due to high interest rates and uncertainty about future disposable income). As a transporter of oil products, inland waterways transport is hit by the effect of the energy crisis, causing a reduction in the volume transported. Since the necessary condition to gain a higher share in total transport seems to lie in the ability to transport goods of NST 9\*, it is worthwhile analysing the relative position of each mode, as well as their respective growth performance. A few key figures are given in Table 7.

\*NST 9: this category contains a wide range of products. For a detailed description, see page 54.

TABLE 7: NST 9 GROWTH RATES, MODAL SPLIT, TONNAGE TRANSPORTED

<u>ROAD</u>	<u>Year</u>	<u>Growth Rate</u>	<u>Tonnage transported(1.000 t)</u>
	1979	9.4%	36.005,0
	1980	2.3%	36.840,6
	1981	- 0.3%	36.713,7
	1982	4.1%	38.202,0
<u>INLAND WATERWAY</u>			
	1979	7.4%	3.332,9
	1980	8.9%	3.628,0
	1981	1.5%	3.682,5
	1982	2.5%	3.773,6
<u>RAIL</u>			
	1979	15.9%	9.476,4
	1980	5.5%	9.999,9
	1981	- 1.0%	9.902,9
	1982	1.4%	10.037,1

MODAL SPLIT OF NST 9

<u>Year</u>	<u>Road</u>	<u>Rail</u>	<u>Inland Waterway</u>	<u>All modes</u>
1979	73.7	19.4	6.9	100
1980	73.0	19.8	7.2	100
1981	73.0	19.7	7.3	100
1982	73.4	19.3	7.3	100

From the table with the modal split, the predominance of road transport in NST category 9 is apparent. At least up to 1982 its strong position seems not to be endangered by the two other modes.

The relative importance of the NST 9 category of goods for each mode of transport (ratio NST 9 / total transport) is given in Table 8.

TABLE 8: SHARE OF NST 9 TRANSPORT IN TOTAL TRANSPORT FOR EACH MODE

	<u>(PERCENTAGE SHARE)</u>			
	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	22.7%	22.5%	22.8%	22.8%
<u>Rail</u>	11.9%	13.3%	14.2%	14.4%
<u>Inland Waterways</u>	1.7%	1.9%	2.0%	2.0%
<u>All modes</u>	11.4%	11.8%	12.1%	12.3%

The increase of NST 9 goods in total transport by rail for the years 1980 and 1981 finds its explanation in the drastic fall in the transport volume of the classical types forwarded by rail.

The problems of rail and inland waterway transport are strongly linked to their specialization in bulk transport. Since the importance of bulk transport in total transport is decreasing, it is not obvious that an upswing of economic activity may improve, or even stabilize their modal share. However, two positive points can be mentioned which can serve as an opportunity to improve their strategy. In the case of the railways, this can be done by promoting container transport and combined transport.

For inland waterways, the argument of container transport is also valid.

D. Changes in transport demand and transport activity by country to country relation.

1. Geographical structure of all modes

Table 9 summarizes the total transport flows (in growth rates) between each EUR-9 Member State and the rest of the Community.

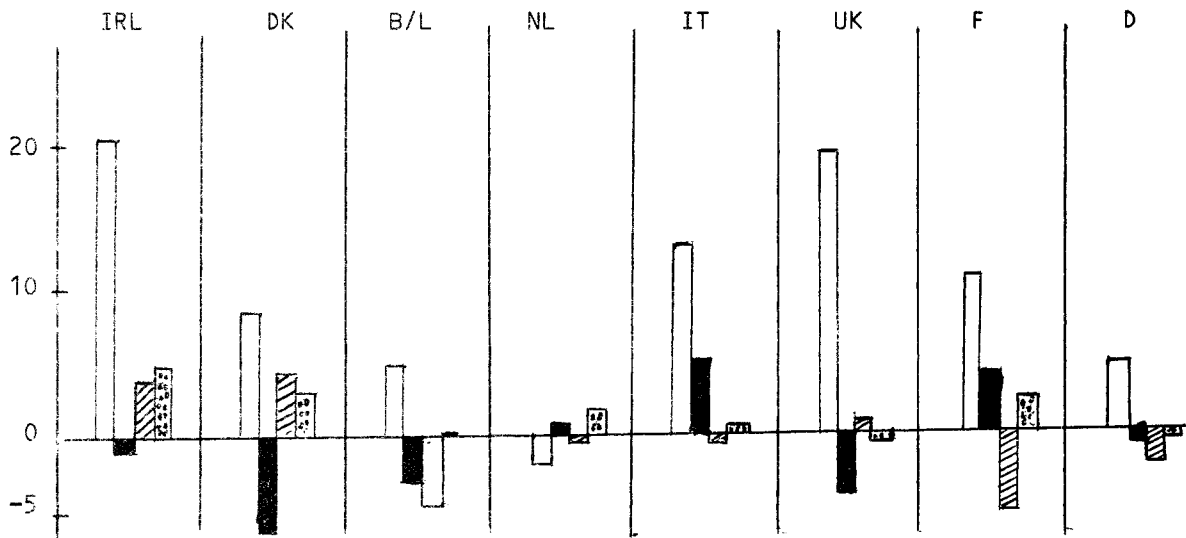
TABLE 9: INTERNATIONAL INTRA-EC GOODS TRAFFIC

(ANNUAL GROWTH RATES)

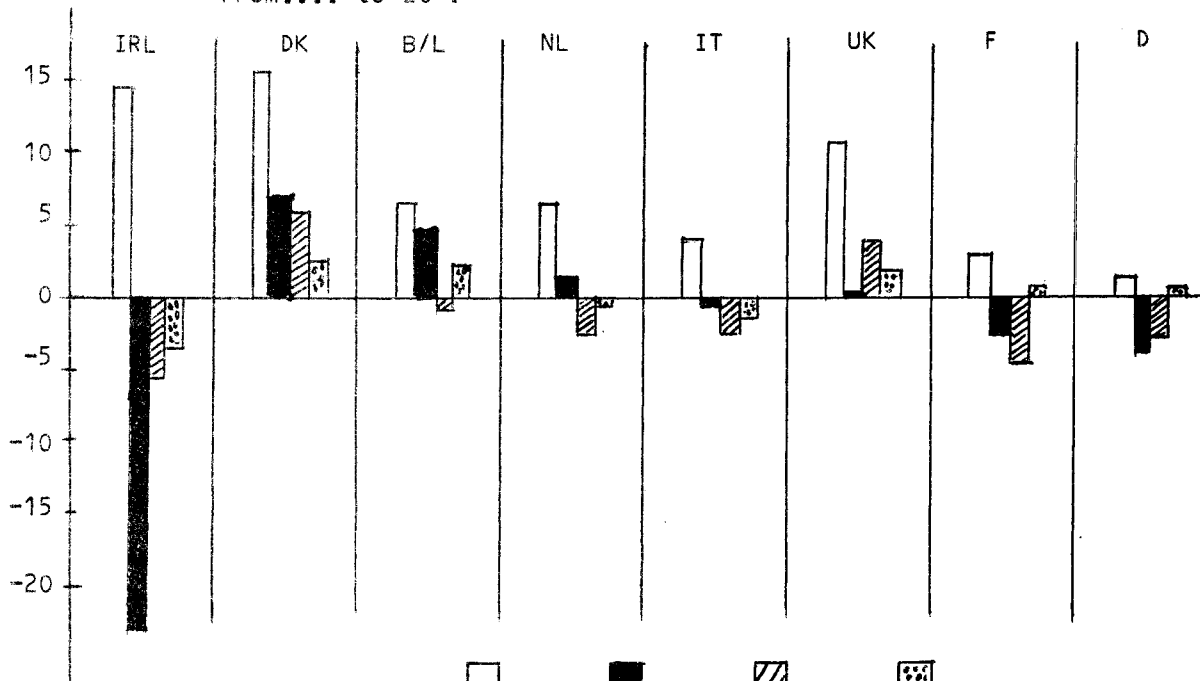
From - To	1979	1980	1981	1982
IRL - EC	14.4	- 23.0	- 5.3	- 3.1
DK	15.2	6.7	5.6	2.5
B/L	6.6	4.2	- 0.8	2.1
NL	6.5	1.1	- 2.9	- 0.4
IT	4.3	- 0.2	- 2.2	- 1.7
UK	10.6	0.1	3.8	1.9
F	3.4	- 2.7	- 4.9	1.1
D	1.6	- 3.6	- 3.1	0.4
EC - IRL	21.7	- 0.5	3.0	3.8
DK	9.5	- 6.9	4.0	2.8
B/L	4.5	- 3.5	- 5.0	0.0
NL	- 1.8	0.9	- 0.1	1.9
IT	13.0	5.1	- 0.3	0.2
UK	19.3	- 4.2	0.7	- 0.4
F	10.6	4.0	- 5.4	2.1
D	4.3	- 1.2	- 2.4	- 0.5
EC - EC	4.7	- 0.3	- 2.7	0.5

GRAPH 5: International intra-EC goods traffic (Annual Growth Rates)

From EC to ...



From... to EC :



□ = 79    ■ = 80    ▨ = 81    ▩ = 82

Declines in inward flows were mostly noted during 1981 in France, Belgium and Germany. In 1982, these transport flows (with the exception of the United Kingdom and Germany) change again to a positive sign.

With the exception of Denmark and the United Kingdom, all outward flows declined in 1981. With the exception of Ireland, the Netherlands and Italy, all these will increase in 1982.

TABLE 10: GEOGRAPHICAL DISTRIBUTION OF TRANSPORT (1982)

	D	F	IT	NL	B	UK	IRL	DK	TOTAL	LEVEL MIO.T	GROWTH RATE
GERMANY	inward	19.80	5.09	57.02	15.25	0.49	0.03	2.32	100	145.9	- 0.5
	outward	18.01	10.30	47.42	21.06	0.96	0.03	2.32	100	104.3	0.4
FRANCE	inward	-	8.13	16.90	40.93	2.70	0.13	0.45	100	61.2	2.1
	outward	-	16.02	8.98	33.34	2.08	0.10	0.49	100	73.9	1.1
ITALY	inward	39.15	-	6.09	9.35	1.16	0.03	0.97	100	27.2	0.2
	outward	48.41	-	7.77	7.78	2.89	0.00	0.77	100	15.4	- 1.7
NETHERLANDS	inward	57.47	1.38	-	30.91	2.13	0.10	0.27	100	86.4	1.9
	outward	61.62	1.24	-	27.40	1.77	0.02	0.30	100	135.0	- 0.4
BELGIUM	inward	25.03	1.36	42.13	-	3.09	0.06	0.19	100	87.7	0.0
	outward	28.14	3.25	33.66	-	2.92	0.09	0.32	100	79.3	2.1
U.K.	inward	11.48	5.09	27.51	26.53	-	4.76	6.94	100	8.8	- 0.4
	outward	8.52	3.81	21.99	32.46	-	7.79	5.68	100	8.5	1.9
IRELAND	inward	3.64	0.07	3.44	7.90	75.57	-	1.09	100	0.9	3.8
	outward	5.48	1.08	13.07	8.23	60.17	-	0.58	100	0.7	- 3.1
DENMARK	inward	58.87	2.98	10.36	6.47	12.02	0.10	-	100	4.0	2.8
	outward	68.51	5.41	4.75	3.34	12.21	0.19	-	100	5.0	2.5

The forecasted changes in the country-to-country structure of goods movements in 1982 are given in Table 10.

From this table, it is apparent which countries are important as zones of origin or destination, in the case of:

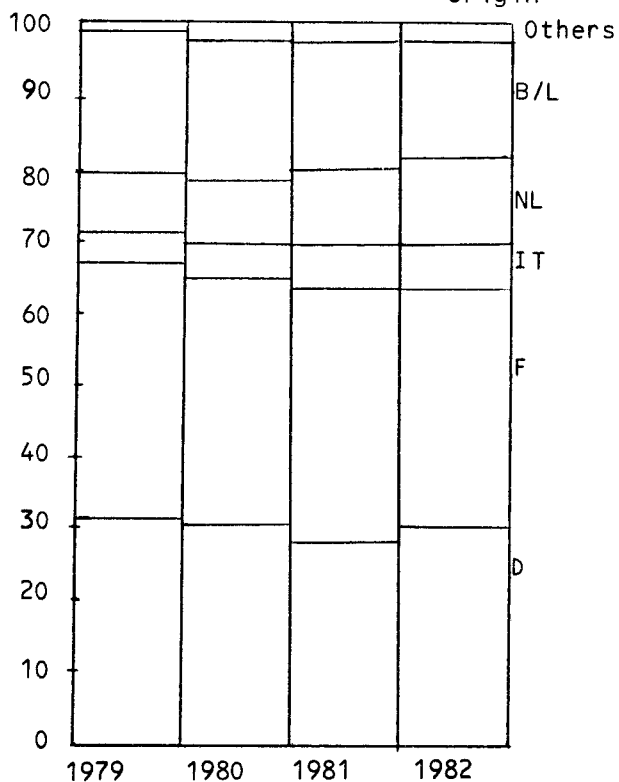
<u>Germany</u>	: the Netherlands, France and Belgium.
<u>France</u>	: Germany, Belgium, the Netherlands (origin) and Italy (destination).
<u>Italy</u>	: Germany and France.
<u>Netherlands</u>	: Germany and Belgium.
<u>Belgium</u>	: France, Germany and the Netherlands.
<u>United Kingdom</u>	: Belgium, the Netherlands and France.
<u>Ireland</u>	: United Kingdom.
<u>Denmark</u>	: Germany and the United Kingdom.

#### IV. GEOGRAPHICAL STRUCTURE OF THE TRANSPORT FLOWS FOR THE DIFFERENT MODES

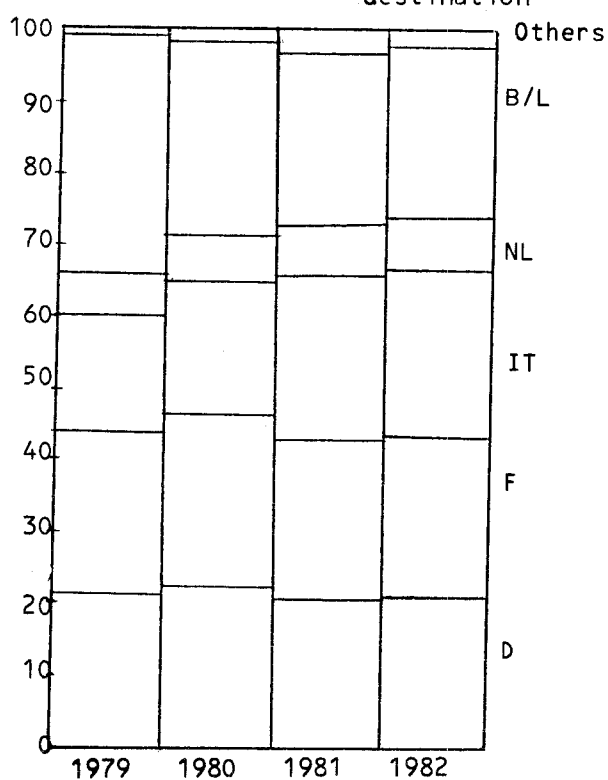
Since each of the three modes has its specific country-to-country breakdown, the geographic structure of transport is analysed for each mode of transport.

1. The following graphs show the geographical structure of rail transport between the Member States of the EUR-9.

**GRAPH 6: Railway Traffic (inward.)**  
origin



**GRAPH 7: Railway Traffic (outward.)**  
destination





To get a better understanding of this country-to-country breakdown, it is useful to look at the relative importance of each NST group for transport by rail (see Table 11 below).

**TABLE 11: RELATIVE IMPORTANCE OF NST GROUPS IN TOTAL TRANSPORT**

**BY RAIL**

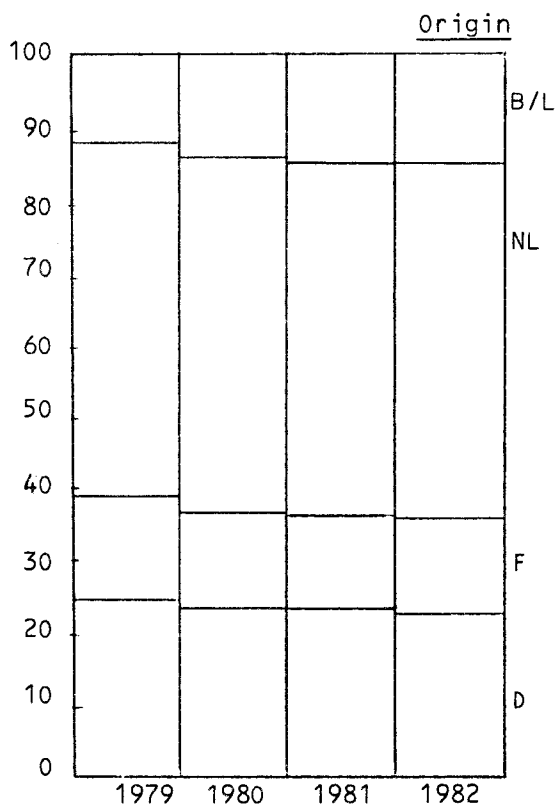
	0	1	2	3	4	5	6	7	8	9
1979	6.34	2.96	17.64	1.79	24.49	19.51	6.19	3.57	5.60	11.88
1980	6.20	3.21	16.35	2.08	24.33	19.01	6.40	3.53	5.55	13.30
1981	7.18	3.75	15.18	1.84	22.71	19.01	6.80	3.58	5.72	14.17
1982	7.05	3.88	15.1	1.87	21.72	18.99	6.62	3.81	6.04	14.44

For rail transport, the most important NST categories appear to be NST 2 (solid mineral fuels), NST 4 (ores and metal waste) and NST 5 (metal products), representing around 60% of the total tonnage carried, with NST 9 increasing its relative importance over the last few years.

The trend of transport flows from Germany towards France and Belgium-Luxembourg shows a negative slope. Transport flows from Belgium to France, from the Netherlands to Belgium and from the Netherlands to France show a positive growth trend. This is due to substitution of coal imported via Rotterdam and transported in the direction North-South for German coal which was traditionally exported to the Belgian-Luxembourg economic union and towards France.

2. The geographical structure of inland waterway transport is shown in Graphs 8 and 9.

GRAPH 8: Inland Waterway Traffic (inward )



Graph 9: Inland Waterway Traffic (outward )

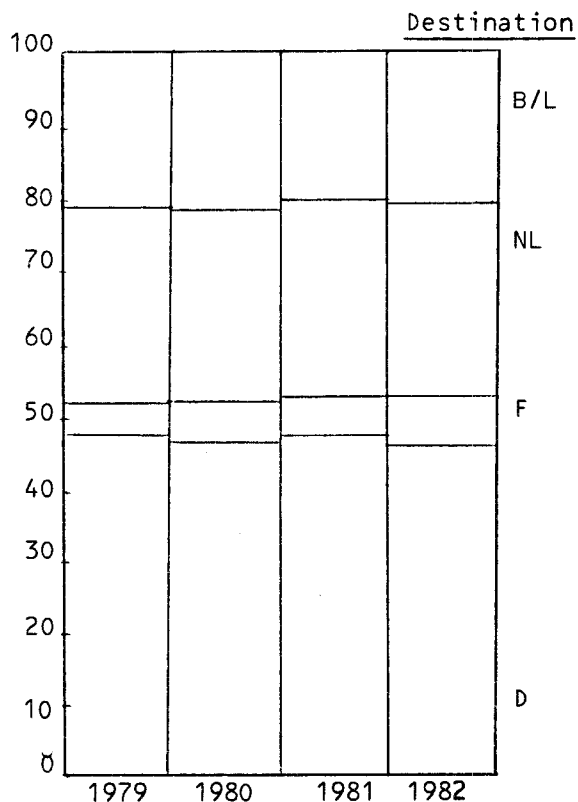


Table 12 shows the relative importance of each NST group in total transport by inland waterways.

TABLE 12: RELATIVE IMPORTANCE OF NST GROUPS IN TOTAL TRANSPORT BY INLAND WATERWAY

	0	1	2	3	4	5	6	7	8	9
1979	4.66	6.78	6.73	14.23	21.65	6.53	28.73	3.87	5.03	1.74
1980	4.44	7.06	7.28	14.57	20.92	5.78	29.85	3.65	4.49	1.91
1981	4.47	7.58	7.72	16.61	20.09	5.84	27.54	3.57	4.54	1.98
1982	4.65	7.75	7.08	16.49	19.95	5.73	27.9	3.66	4.7	2.04

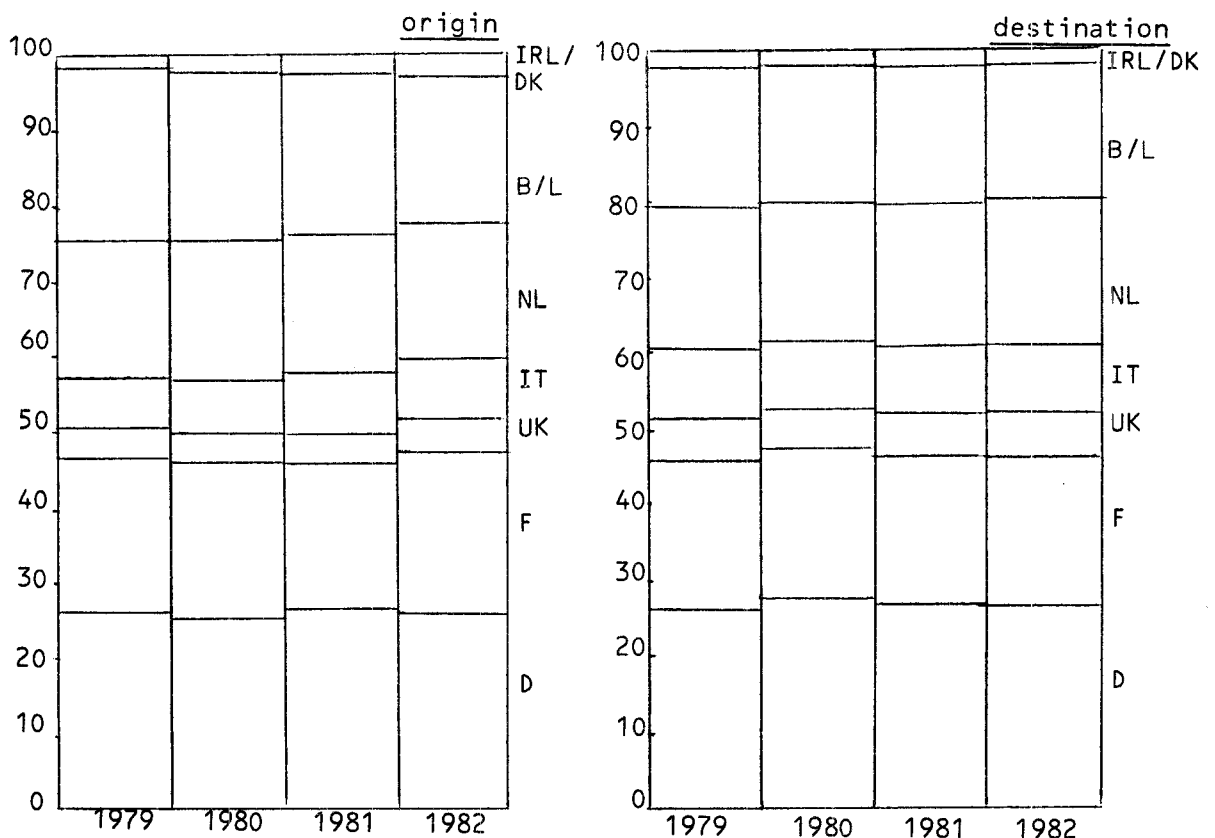
The most important categories are NST 3 (oil products), NST 4 (ores and metal waste) and NST 6 (building materials). They represent around 65% of the total tonnage carried.

For inland waterways, the same remarks are valid for the carriage of coal as is the case for transport by rail. The decrease in the transport relation Germany to France and Germany to Belgium-Luxembourg over the years 1979-82 is larger in percentage terms for inland waterway transport than for rail transport.

3. The geographical structure of road transport is shown in Graphs 10 and 11.

GRAPH 10 : Road Transport  
(inward )

GRAPH 11 : Road transport  
(outward)



Road transport is less concentrated than other transport modes. One can expect this tendency to continue in the future since the regional policy of the EC is aiming at more decentralized industrial activities. This is in sharp contrast to what has happened in the past, when industrial sites were mostly located in the neighbourhood of ports or coal mines.

This regionalization of industrial activities, which is also a social objective that takes into consideration environmental aspects, constitutes another argument to the thesis that road transport is likely to increase further its share.

Table 13 shows the relative importance of each NST group in total transport by road. It indicates that the four following categories of goods are the most important: (1) foodstuffs and animal fodder; (2) building materials; (3) chemicals; (4) machinery and manufactured articles, etc.

TABLE 13: RELATIVE IMPORTANCE OF NST GROUPS IN TOTAL  
TRANSPORT BY ROAD

	0	1	2	3	4	5	6	7	8	9
1979	10.93	14.68	1.44	2.40	1.33	8.39	21.91	1.33	14.86	22.68
1980	11.19	14.76	1.38	2.08	1.44	8.73	21.87	1.45	14.52	22.54
1981	11.50	15.91	1.44	1.83	1.38	8.46	20.66	1.51	14.50	22.77
1982	11.58	15.63	1.46	1.79	1.41	8.52	20.58	1.55	14.58	22.87



PART II

CARRIAGE OF CERTAIN MAJOR CATEGORIES OF GOODS

In this second part, a short comment is given on the changes which take place in the transport of each NST group (0-9).

For each group, the tonnage transported, the modal split and the geographical structure are analysed and some brief comments are given.

## 1. Carriage of NST 0 goods

### 1.1. Type of goods

NST 0 contains agricultural products and live animals.

### 1.2. Transport developments

Goods in this category are mainly transported by road and (to a lesser extent) by inland waterway (see Table 14).

TABLE 14: MODAL SPLIT OF NST 0

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	55.43%	58.33%	58.22%	58.88%
<u>Rail</u>	16.15%	14.86%	15.76%	14.89%
<u>Inland Waterway</u>	28.42%	26.81%	26.0%	26.23%
	100.0	100.0	100.0	100.0

The weight of NST 0 in total tonnage transported is highest for road transport ( $\pm 11\%$ ). This category is of minor importance for rail and inland waterways ( $\pm 7\%$  and  $\pm 4.5\%$ ).

Total tonnage transported and the corresponding growth rates are shown in Table 15.

TABLE 15: TONNAGE TRANSPORTED (MIO T)  
(FIGURES IN BRACKETS ARE GROWTH RATES)

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	17.3(6.4%)	18.3(5.5%)	18.5(1.3%)	19.4(4.4%)
<u>Rail</u>	5.1(4.2%)	4.7(-7.8%)	5.0(7.7%)	4.9(-2.4%)
<u>Inland Waterway</u>	8.9(-6.8%)	8.4(-5.5%)	8.3(-1.4%)	8.6(4.1%)
	31.3(1.9%)	31.4(0.2%)	31.8(1.5%)	32.9(3.3%)

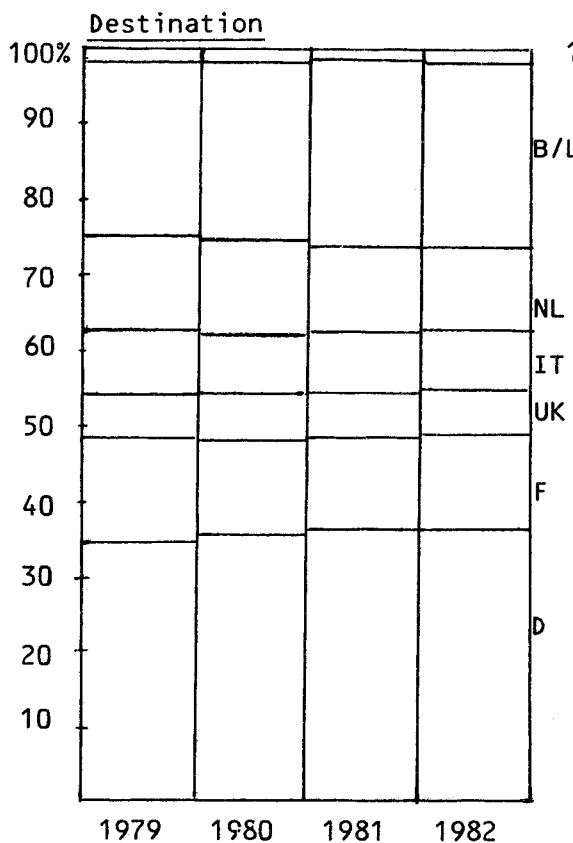
From Table 15 it appears that this NST category is not very sensitive to business cycle fluctuations, which is explained by a roughly constant demand for these products.

### 3. Geographical pattern of transport

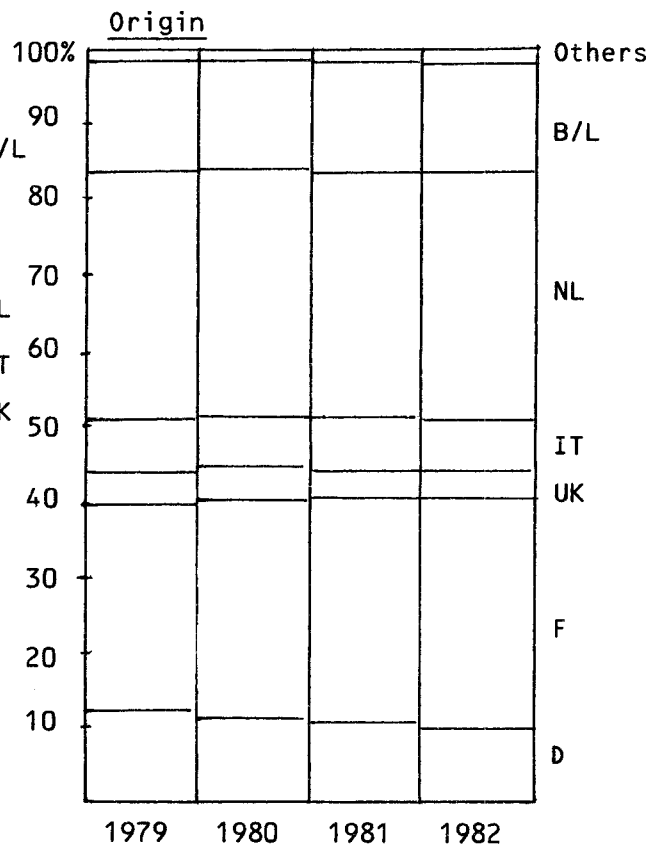
In the case of road transport the most important flows take place from France to Belgium, France to Germany and from the Netherlands to Germany and Belgium. These relationships account for  $\pm$  47% of total traffic for NST O.

For inland waterway transport the most important flows are from France to Belgium/Luxembourg, from France to the Netherlands and Germany, from the Netherlands to Germany. They represent 56.5% of the total inland waterway traffic for this NST category.

GRAPH 12: Road Traffic (outward)

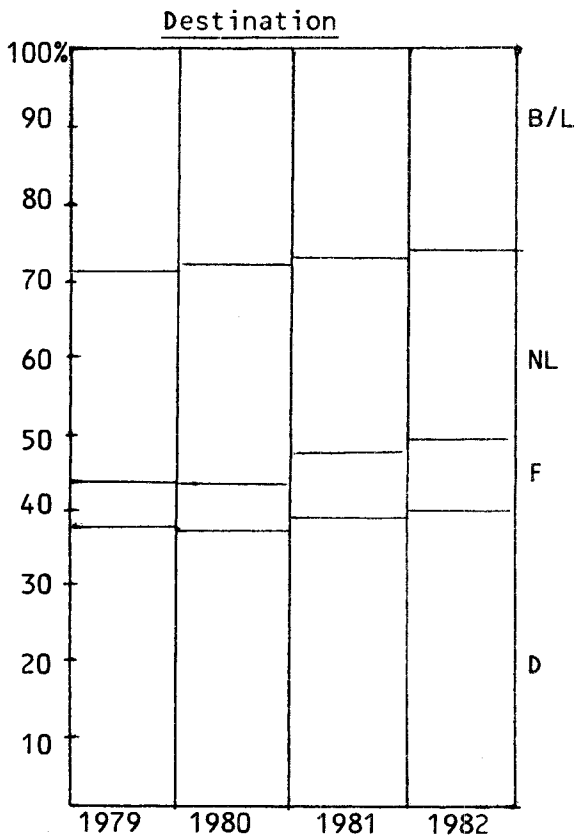


GRAPH 13: Road traffic (inward)

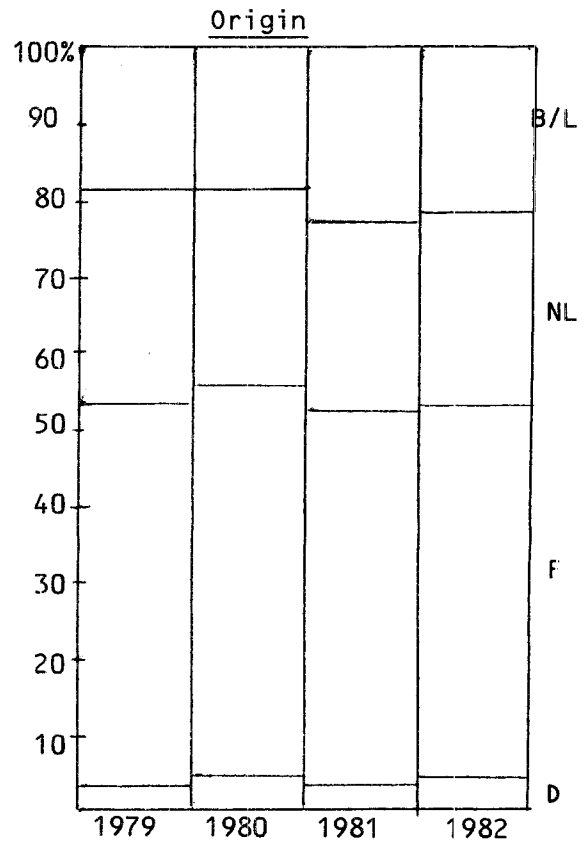




GRAPH 14: Inland Waterway Traffic (outward)



GRAPH 15: Inland Waterway Traffic (inward)



## 2. Carriage of NST 1 goods

### 2.1. Type of goods

NST 1 contains various foodstuffs and animal fodder: sugars, beverages, stimulants and spices, perishable and other non-perishable foodstuffs and hops, animal food and foodstuff waste, oil seeds and oleaginous fruit and fats.

### 2.2. Transport developments

This NST category does not differ greatly from NST 0. As it appears from the following table, the same modes, i.e. road and inland waterway, are the most important for the carriage of these goods.

TABLE 16: MODAL SPLIT OF NST 1

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	60.35%	60.47%	60.63%	60.68%
<u>Rail</u>	6.12%	6.06%	6.20%	6.16%
<u>Inland Waterway</u>	33.53%	33.47%	33.17%	33.16%
	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>	<u>100.00%</u>

It is for road transport only that the weight of NST 1 shows some importance if compared to the total tonnage carried by this mode ( $\pm 15\%$ ); for waterway, this represents 7.4%.

Total tonnage transported and the corresponding growth rates are shown in Table 17.

TABLE 17: TONNAGE TRANSPORTED (MIO T)  
(FIGURES IN BRACKETS ARE GROWTH RATES)

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	23.3(9.5%)	24.1(3.6%)	25.7(6.3%)	26.1(1.8%)
<u>Rail</u>	2.4(56%)	2.4(2.2%)	2.6(8.5%)	2.7(1.2%)
<u>Inland Waterway</u>	12.9(1.2%)	13.4(3.1%)	14.0(5.1%)	14.3(1.7%)
<u>Total</u>	38.6(8.5%)	39.9(3.3%)	42.3(6%)	43.0(1.7%)

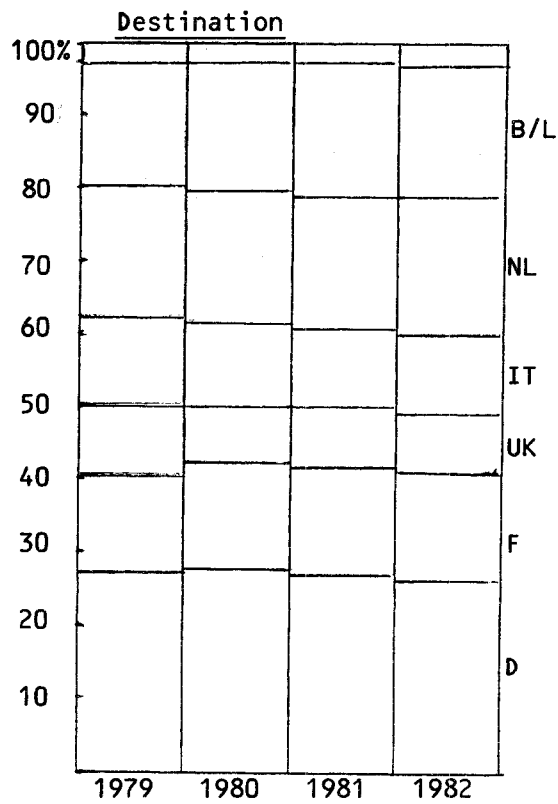
This NST category also does not seem to have suffered from the recession. These phenomena already explain to some extent why road transport is not so severely hit by the crisis.

## 2.2. Geographical pattern of transport

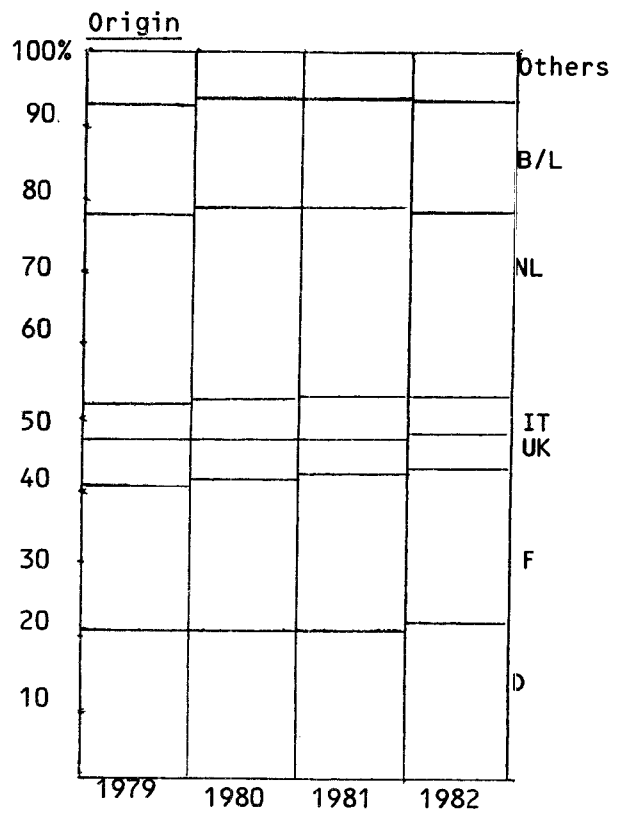
In the case of road transport, the most important transport flows take place from the Netherlands to Belgium and Germany, from Belgium to the Netherlands and France, from France to Belgium and Germany, and from Germany to the Netherlands and Italy ( $\pm 55\%$ ).

For transport by inland waterways, the most important flows take place from the Netherlands to Belgium and Germany and from France to Germany ( $\pm 69\%$  of the total).

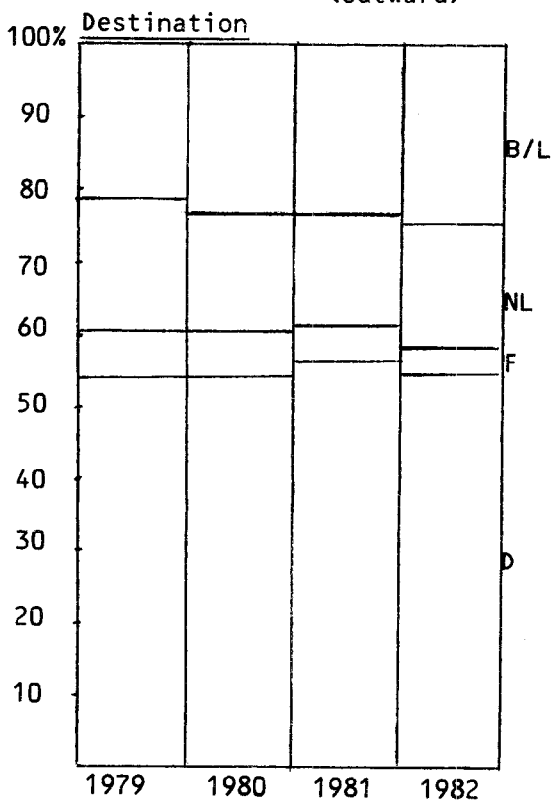
**GRAPH 16: Road Transport (outward)**



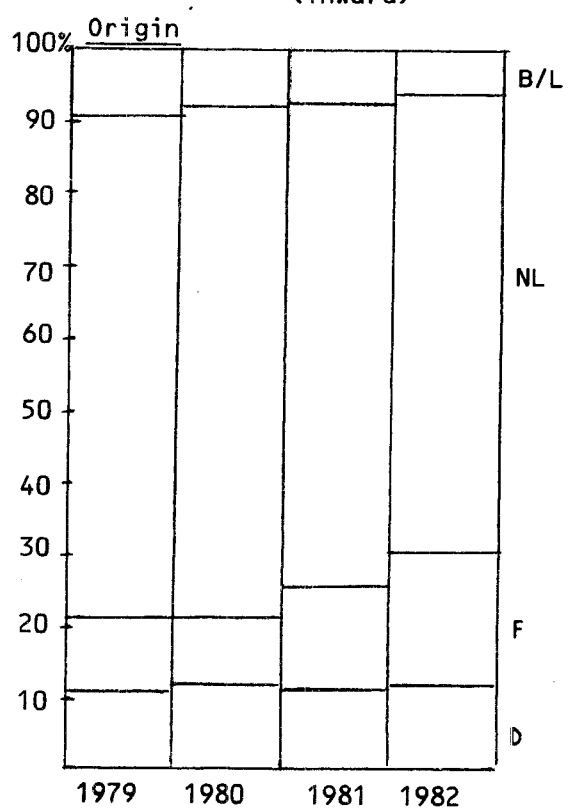
**GRAPH 17: Road Transport (inward)**



**GRAPH 18: Inland Waterway (outward)**



**GRAPH 19: Inland Waterway (inward)**



### 3. Carriage of NST 2 goods

#### 3.1. Type of goods

NST 2 contains the various solid mineral fuels: coal, lignite and peat, coke.

#### 3.2. Transport developments

Goods of this type are basically carried by rail and inland waterways as it appears from Table 18.

TABLE 18: MODAL SPLIT OF NST 2

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	7.84 %	7.98 %	8.58 %	8.42 %
<u>Rail</u>	48.17 %	43.38 %	38.95 %	40.56 %
<u>Inland Waterway</u>	43.99 %	48.54 %	52.47 %	51.02 %
	100.0 %	100.0 %	100.0 %	100.0 %

The weight of road transport in the carriage of these goods is minor, and for that reason this mode is not analysed in this section.

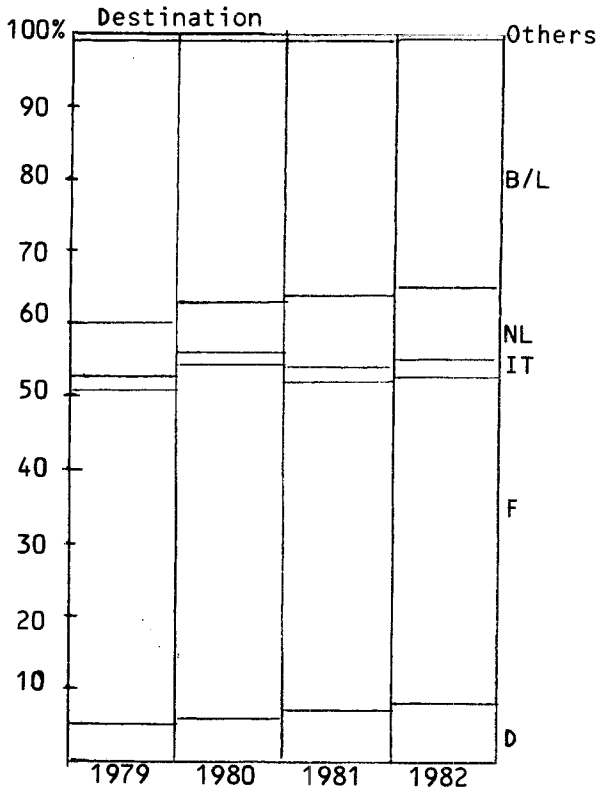
Total tonnage transported and the corresponding growth rates are given in Table 19.

TABLE 19: TONNAGE TRANSPORTED (MIO T)  
(FIGURES IN BRACKETS ARE GROWTH RATES)

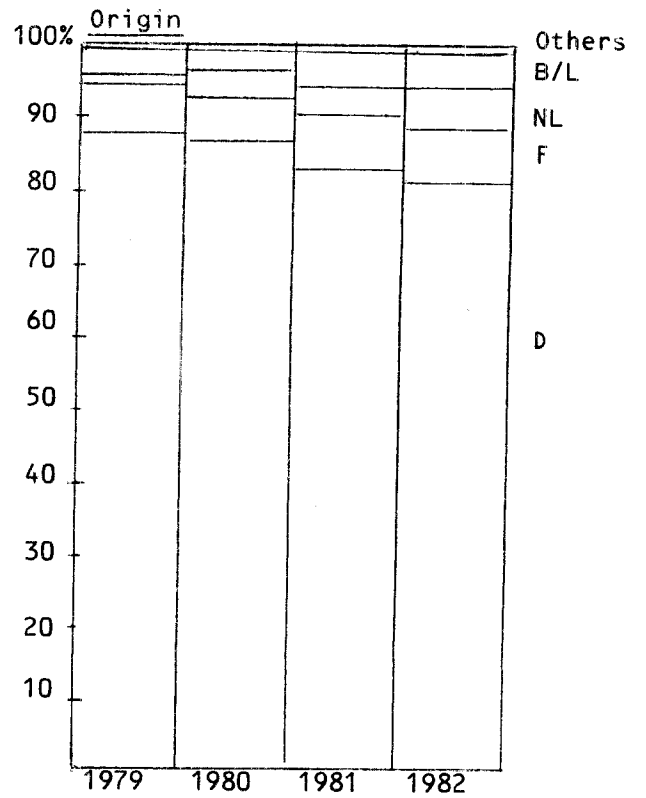
	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	2.3(25.7%)	2.3(-1.23%)	2.3(3.3%)	2.2(-4.3%)
<u>Rail</u>	14.1(24.2%)	12.3(-12.6%)	10.6(-13.7%)	10.5(-0.9%)
<u>Inland Waterway</u>	12.8(-14.5%)	13.8(7.3%)	14.3(3.7%)	13.1(-8.4%)
<u>Total</u>	29.2(3.7%)	28.3(-3.0%)	27.2(-3.9%)	25.8(-5.0%)

3.3. Geographical pattern of transport

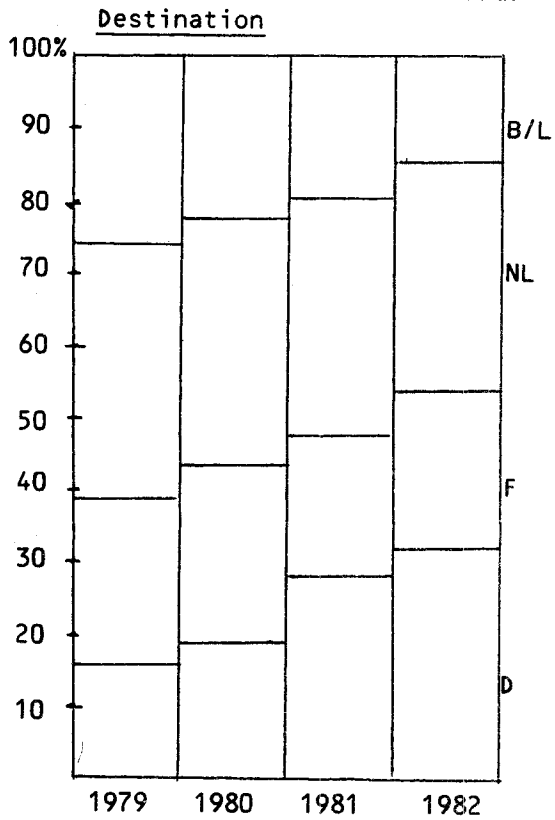
GRAPH 20: Rail traffic (outward)



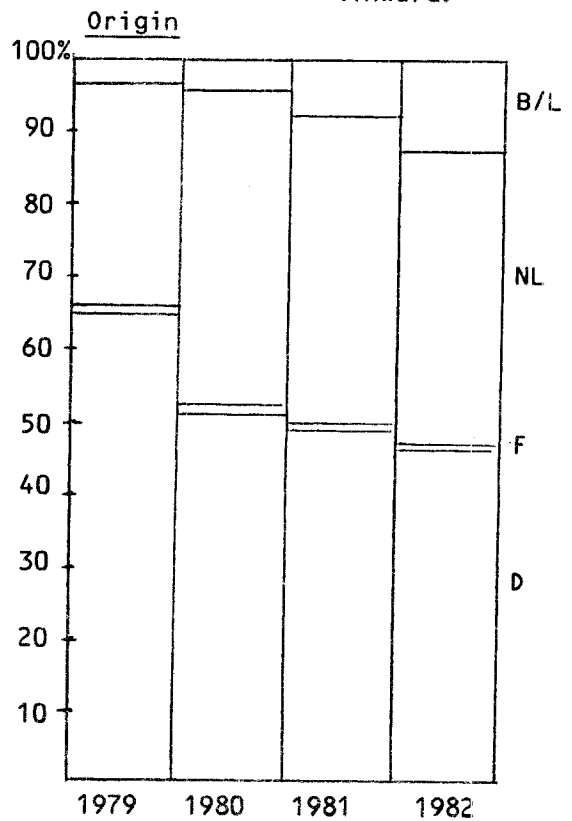
GRAPH 21: Rail traffic (inward)



GRAPH 22: Inland Waterway Traffic (outward)



GRAPH 23: Inland Waterway Traffic (inward)



The figures for the period 1979-1982 suggest that there is no parallelism between rail and inland waterway transport of NST 2 goods. This difference is due to several factors, specific to each of the two modes.

For rail, the downwards change for the years 1980 and 1981 continues in 1982. The main determinant in this case is the situation in the steel industry in Europe. The 1982 forecast is mainly based on the available forecast for that industry. The market for steam coal\* is strongly influenced by the overall energy situation and the relative prices of each energy source, causing substitution to take place between the different sources of energy. Although up to now the effect has been rather small, replacing oil by coal, in certain thermal power stations, will necessitate larger quantities of steam coal to be transported. Even if in the near future the substitution of coal for oil will take place at a more rapid pace, the influence of the steel sector will continue to dominate.

Positive growth for the total tonnage carried by inland waterway in 1980 and 1981 is explained by the low level of activity in 1979, due to bad weather conditions. In that perspective, the growth performance in the years 1980 and 1981 (7.3% and 3.7%) are not sufficient to compensate for the loss of -14.5% in 1979.

The same argument is valid to explain the performance of rail in 1980-1981. In 1979 the railways took advantage of the situation that arose in inland waterways. This also explains (partly) the poor performance of rail in 1980 and 1981, because in addition to the negative effect from the steel industry, a further decrease in activity occurred since the situation in inland waterways came back to normal in those years. In 1982 inland waterway will be affected more than rail for the transport of NST 2 goods (-8.4% versus -0.9%).

The country-to-country breakdown of the carriage of this NST category is very concentrated. In the case of rail transport, the four most important countries are Germany, France and Belgium-Luxembourg (86% in 1982).

---

\* Steam Coal: coal supported to thermal power stations.

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Germany → France	5.99(17.33%)	5.45(-8.9%)	4.20(-23.0%)	4.0(1.0%)
"      Belgium/ Luxembourg	5.14(26.5%)	8.19(-18.6%)	3.42(-18.5%)	3.23(0.9%)

In 1981 the decrease in the transport flow of coal from Germany to France has been larger than the decrease in the flow to Belgium. To some extent, this is explained by the fact that for the last relation it includes also domestic heating fuels, and these have helped to alleviate the impact of the steel crisis on these routes.

In the case of inland waterways there appear to be two important regions of origin of the transport flows, i.e. the Netherlands (towards Germany, France and Belgium-Luxembourg) and Germany (towards Belgium-Luxembourg, the Netherlands and France.)

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Netherlands → Belgium/ Luxembourg	1.6(91.5%)	1.9(23.4%)	1.6(-17.3%)	1.0(-37.3%)
"            France	0.7(-26.4%)	1.7(167.8%)	1.3(-23.7%)	1.3(+0.9%)
"            Germany	1.9(65.0%)	2.3(24.8%)	3.2(36.7%)	3.0(-7.8%)
Germany → Belgium/ Luxembourg	1.8(-28.3%)	1.1(-37.2%)	0.9(-16.2%)	0.7(-23.1%)
"      → Netherlands	4.4(-38.0%)	4.4(0.04%)	4.5(3.3%)	4.1(-10.2%)
"      → France	2.2(-2.4%)	1.6(-25.3%)	1.5(-4.9%)	1.3(-14.9%)

German outward flows (all destinations) declined throughout the period 1979-82, while outward flows from the Netherlands showed the opposite evolution (except for 1982, where Dutch outward flows of coal will undergo a strong influence of a fall in demand from Belgium).

#### 4. Carriage of NST 3 goods

##### 4.1. Type of goods

NST 3 contains petroleum products: crude petroleum, fuel derivatives, gaseous hydrocarbons; liquid or compressed, non-fuel derivatives.

##### 4.2. General developments

In the last five year period many changes have taken place in relation to transport of this NST category. These were mainly a reaction to the increase of oil prices and the economic shocks caused by it.

Besides the general economic situation and the level of industrial activity, the policies to encourage energy saving may have a different impact on each energy source.

TABLE 20: MODAL SPLIT OF NST 3

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	11.78%	10.46%	8.46%	8.58%
<u>Rail</u>	4.43%	4.82%	3.69%	3.81%
<u>Inland Waterway</u>	83.79%	84.72%	87.85%	87.61%
	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>

Of the three modes analysed, inland waterway carries the largest proportion of these goods.

Total tonnage transported and the corresponding growth rates are given in Table 21.

TABLE 21: TOTAL TONNAGE TRANSPORTED (MIO T)

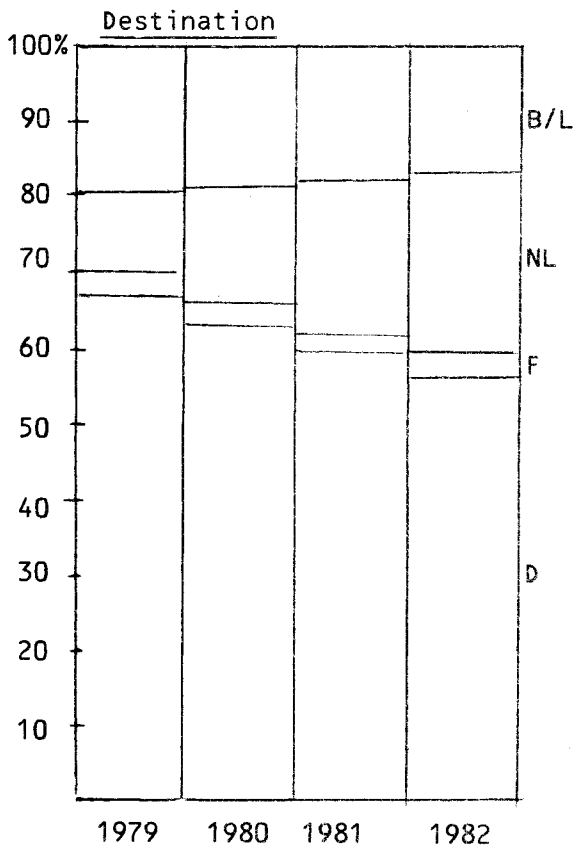
	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	3.8(0.3%)	3.4(-10.8%)	3.0(-13.0%)	3.0(+1.0%)
<u>Rail</u>	1.4(47.7%)	1.6(9.2%)	1.3(-17.6%)	1.3(+2.7%)
<u>Inland Waterway</u>	27.1(-10.8%)	27.6(1.5%)	30.7(+11.6%)	30.5(-0.7%)
<u>Total</u>	32.4(-8.0%)	32.5(0.4%)	35.0(+7.6%)	34.8(-0.5%)

The relative importance of the carriage of NST 3 for inland waterway is about 15% of total inland waterway transport.

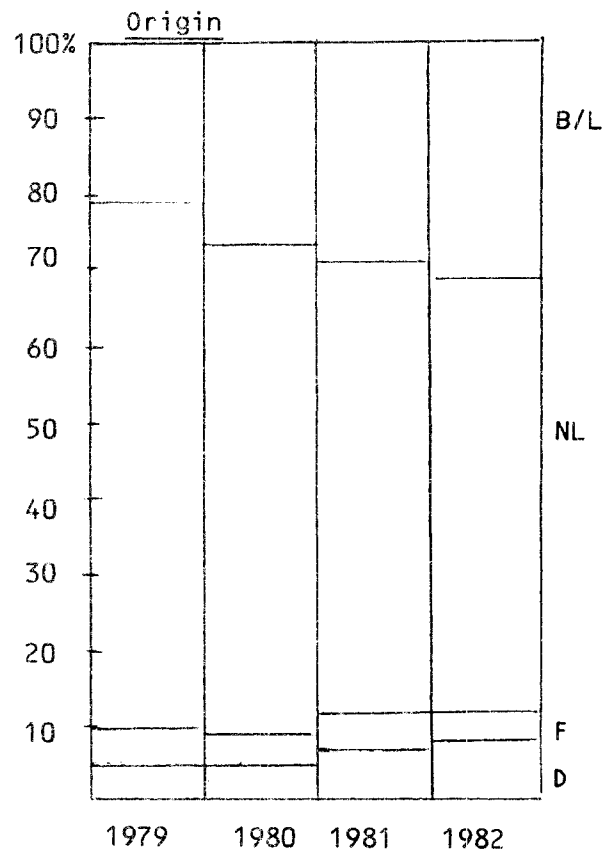


### 4.3. Geographical pattern of transport

GRAPH 24: Waterway Traffic (outward)



GRAPH 25: Waterway Traffic (inward)



The most important flow takes place between the Netherlands and Germany. The role of the port of Rotterdam becomes obvious here.

#### VOLUME OF NST 3 CARRIED BY INLAND WATERWAY (Levels and growth rates)

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Netherlands → Germany</u>	13.8(-25.7%)	12.6(-9.0%)	13.2(4.8%)	12.3(-6.8%)
<u>Belgium/ Luxembourg → Germany</u>	3.3(-18.9%)	3.8(14.7%)	3.9(3.9%)	3.4(-4.8%)
<u>France → Germany</u>	1.2(-19.3%)	1.1(-12.2%)	1.3(21.5%)	1.3(-1.9%)
<u>Netherlands → Belgium</u>	4.7(42.1%)	4.8(3.5%)	5.2(6.9%)	5.0(-3.8%)
<u>Belgium / Luxembourg → Netherlands</u>	2.3(46.6)	3.4(45.0%)	4.7(39.0%)	5.4(15.4%)

Also, the transport flows from Belgium and France to Germany have some importance. The same is true for the traffic between Belgium/Luxembourg and the Netherlands.

## 5. Carriage of NST 4 goods

### 5.1. Type of goods

This category contains the ores and metal waste used by the iron and steel industry: iron-ore, non-ferrous ores and waste, iron and steel waste.

### 5.2. General developments

Transport of these goods, as is the case for coke transport, is very much determined by the situation in the steel industry.

For this reason, estimates and forecasts are derived from the production plans of the steel industry.

The chief modes of transport of this market are railway transport and inland waterway (see Table 22).

TABLE 22: MODAL SPLIT OF NST 4

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	3.37%	3.92%	4.03%	3.88%
<u>Rail</u>	31.01%	30.37%	28.69%	27.90%
<u>Inland Waterway</u>	65.61%	65.71%	67.28%	68.22%
<u>Total</u>	100.00%	100.00%	100.00%	100.00%

Traffic carried by each of the three modes is given in Table 23.

TABLE 23: TOTAL TONNAGE TRANSPORTED (MIO T)

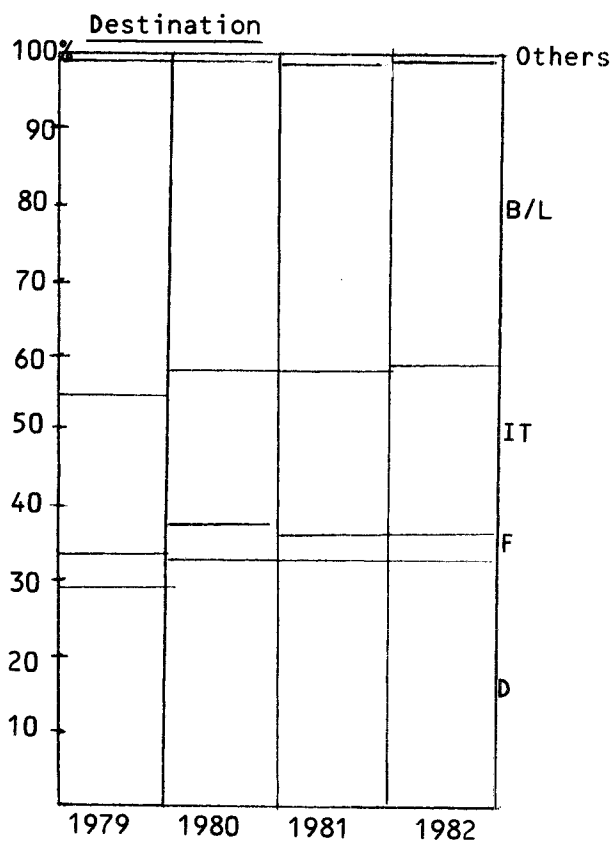
<u>Road</u>	2.1(3.2%)	2.4(11.3%)	2.2(-5.7%)	2.1(-4.5%)
<u>Rail</u>	19.5(-2.4%)	18.3(-6.4%)	15.9(-13.2%)	15.1(-5.0%)
<u>Inland Waterway</u>	41.3(18.8%)	39.6(-4.2%)	37.2(-6.0%)	36.9(-0.8%)
<u>Total</u>	62.9(10.8%)	60.2(-4.4%)	55.3(-8.2%)	54.1(-2.2%)

Although the largest volumes are carried by inland waterway, the relative share of these goods in total transport is higher for rail (it is negligible for road transport)(see Table 24).

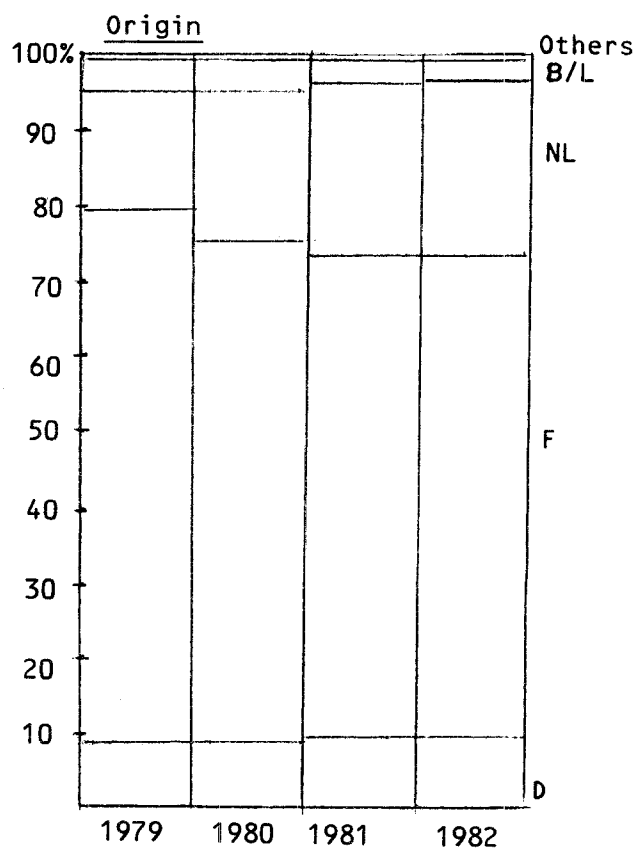
TABLE 24: SHARE OF NST 4 TRANSPORT IN TOTAL

TRANSPORT OF EACH MODE				
	1979	1980	1981	1982
<u>Road</u>	1.33%	1.44%	1.38%	1.41%
<u>Rail</u>	24.49%	24.33%	22.71%	23.57%
<u>Inland Waterway</u>	21.65%	20.92%	20.09%	20.67%
<u>All modes</u>	14.66%	14.07%	13.28%	13.75%

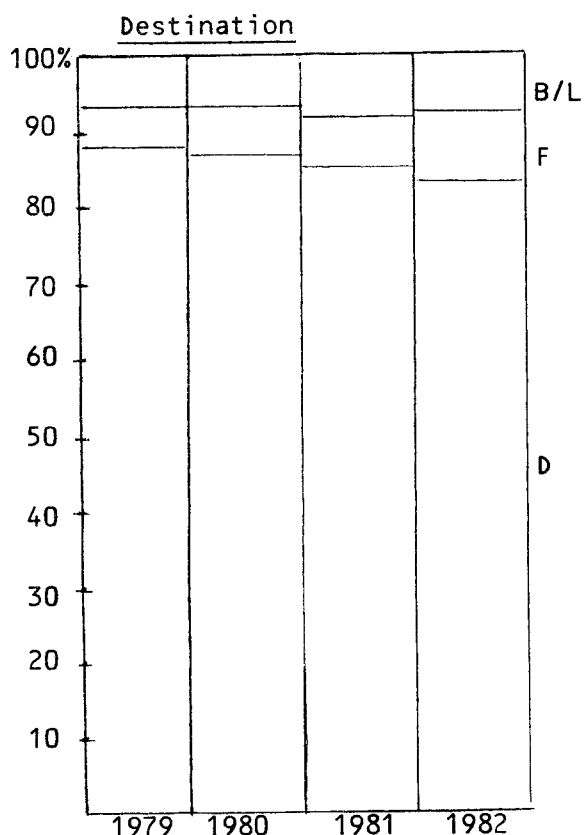
GRAPH 27: Rail Traffic (outward)



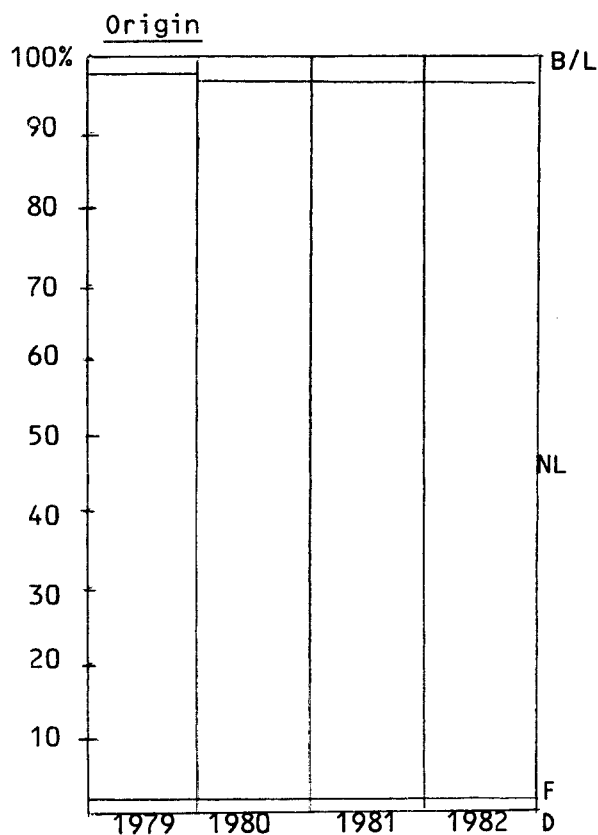
GRAPH 28: Rail Traffic (inward)



**GRAPH 29: Inland Waterway  
(outward)**



**GRAPH 30: Inland Waterway  
(inward)**



In the case of the railways, the most important flows take place from the Netherlands to Germany, from France to Belgium/Luxembourg, Italy and Germany, from Germany to Italy.

As an exporter, France is the most important with 63.5% of total intra-EC exports of NST 4 in 1982. Although of less importance than France, the Netherlands gain importance as an exporter to the other EC Countries, as it appears from the following figures:

OUTWARD FLOWS OF NST 4 GOODS FROM THE NETHERLANDS TO THE EC

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Level</u> (MIO T)	3.09	3.69	3.64	3.58
<u>Growth rate</u>	19.8%	19.11%	- 1.23%	- 1.68%
<u>Relative share</u>	15.9%	20.2%	23.0%	23.7%

These figures have to be compared with the corresponding ones for France:

OUTWARD FLOWS OF NST 4 GOODS FROM FRANCE TO THE EC

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Level</u> (mio t)	13.93	12.25	10.21	9.59
<u>Growth rate</u>	- 8.3%	- 12.0%	- 16.7%	-6.08%
<u>Relative share</u>	71.3%	67.0%	64.4%	63.5%

These figures indicate that France is loosing its share to the Netherlands. The main reason for this change is the increasing use of iron-ore imported from third countries via the port of Rotterdam and then transported by train to different EC countries. The exports from France to Belgium/Luxembourg and Germany are affected negatively.

The other important flow, from Germany to Italy, shows positive growth rates both for 1981 and 1982, (4.9% and 15.3%), and represents mainly ferrous scrap for Italian manufacturers with electric furnaces.

In the case of inland waterways, by far the most important transport flow takes place between the Netherlands and Germany (84.0% in 1982).

CARRIAGE OF NST 4 GOODS BY WATERWAY FROM THE NETHERLANDS TO

	<u>GERMANY</u>			
	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Level</u> (mio t)	36.65	34.48	31.77	31.0
<u>Growth rate</u>	17.6%	- 5.9%	- 7.9%	- 2.4%

6. Carriage of NST 5 goods

6.1. Type of goods

NST 5 contains metal products: pig iron and steel, semi-finished rolled steel products, sections, steel plates and sheets, tubes and pipes, non-ferrous metals.

## 6.2. General developments

An important user of products of this NST category is the car industry. It uses mainly thin sheets. It has been assumed that the car industry has reached the bottom of the cycle in 1981 and that in 1982 demand for cars will increase. However, it is extremely difficult to realise any accurate forecast of spending on durable consumer goods in a climate of economic uncertainty, especially since it is not known to what extent increased demand for cars will lead to higher imports from certain third countries and not to a larger production volume in the European car industry.

Another important client for those goods is the building industry, using products such as concrete reinforcing bars and sections for metal structures. The growth perspectives of this industry are relatively moderate for 1982, and this is because of several reasons.

First of all, it is not so difficult to get a more or less accurate idea about the short-term future growth perspectives, since in most cases a building permit is required before the actual construction can start. For this reason, the number of building permit demands is a good indicator of the future activity in the construction of dwellings and this has been used as a proxy for future activity in this sector of the building industry.

Public investment expenditure is bound to remain tight, given the necessity to reduce the public budget deficits.

This market is important for all three modes of transport (see Table 26).

TABLE 26: MODAL SPLIT OF NST 5

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	32.22 %	36.14 %	36.15 %	35.78 %
<u>Rail</u>	37.64 %	36.19 %	35.18 %	35.70 %
<u>Inland Waterway</u>	30.14 %	27.67 %	28.67 %	28.51 %
	100.0 %	100.0 %	100.0 %	100.0 %

TABLE 27: TOTAL TONNAGE TRANSPORTED (MIO T)

(GROWTH RATES IN BRACKETS)

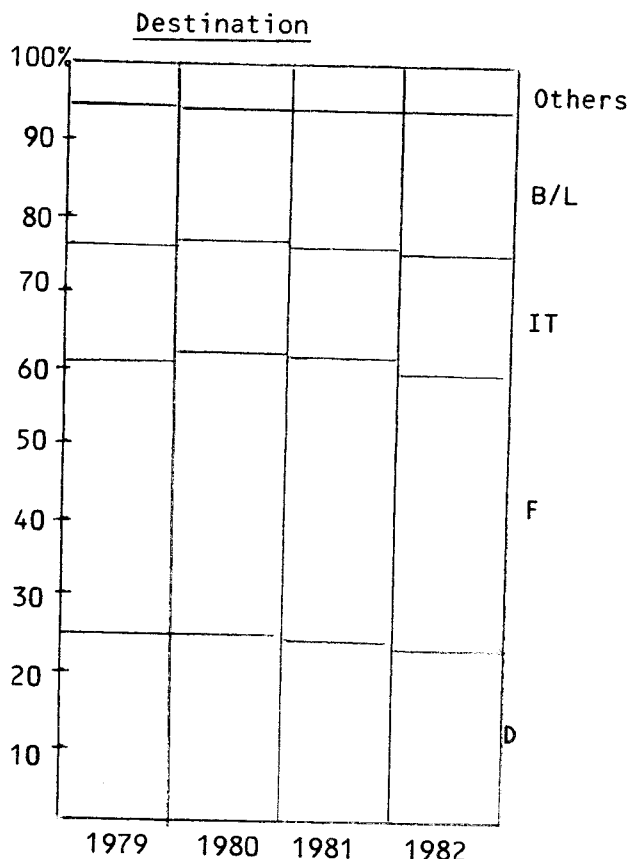
	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	13.3(6.8%)	14.3(7.1%)	13.6(-4.4%)	13.3(-2.2%)
<u>Rail</u>	15.6(17.1%)	14.3(-8.2%)	13.3(-7.1%)	13.2(-0.8%)
<u>Inland waterway</u>	12.5(-10.2%)	10.9(-12.3%)	10.8(-1.0%)	10.6(-1.9%)
<u>Total</u>	41.3(4.3%)	39.5(-4.5%)	37.7(-4.4%)	37.1(-1.5%)

While 1981 resulted in a negative growth for every mode, the three modes are expected to grow again in a positive sense in 1982.

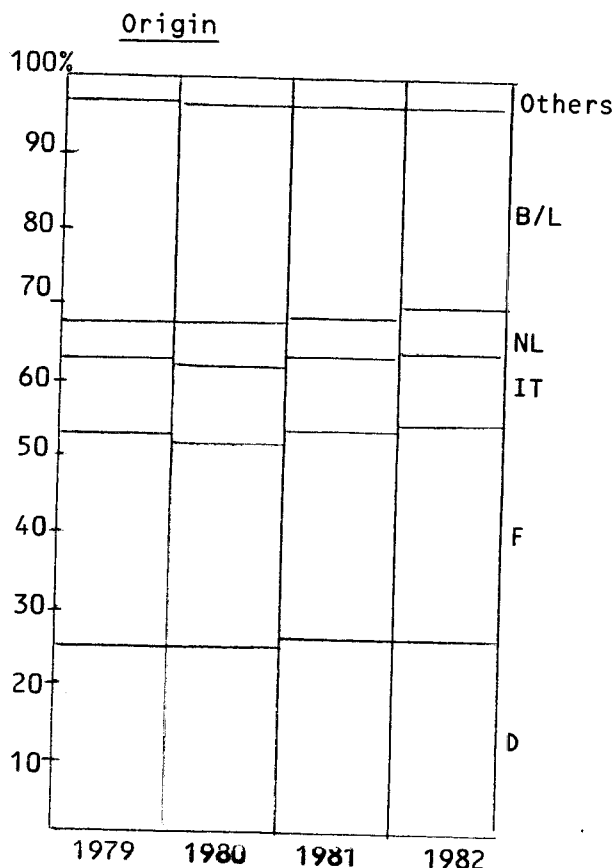
Although each of the three modes is highly involved in the transport of these goods, the importance in total transport of each mode is different. Roughly 19% of total transport by rail goes to this NST group, against 8.5% to road transport and 6% to inland waterways.

### 6.3. Geographical pattern of transport

GRAPH 30: Railway traffic (outward)



GRAPH 31: Railway traffic (inward)



Since railways carry the largest volume of this NST category and taking into account that the geographical distribution for the other transport modes is about identical, the analysis is limited to that mode.

The number of countries of origin is rather limited and coincides with the location of the iron and steel industry plants (Belgium/Luxembourg, France, Germany). The most important countries of destination are Belgium/Luxembourg, Italy, France and Germany.

## 7. Carriage of NST 6 goods

### 7.1. Type of goods

NST 6 contains building materials: sand and gravel, salts, iron pyrites and sulphur, other stone, earths and minerals, cement and lime, plaster and other manufactured building materials.



## 7.2. Transport developments

It is obvious that the key industry in this context is the building industry. For that reason, the same arguments are valid as those used in the case of transport of NST 5 goods, for the housing sector as well as for the infrastructure sector.

The most important modes for this kind of transport are inland waterway and road transport (see Table 28).

TABLE 28: MODAL SPLIT OF NST 6

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	36.79 %	36.85 %	37.41 %	36.96 %
<u>Rail</u>	5.23 %	4.96 %	5.34 %	5.17 %
<u>Inland Waterway</u>	57.98 %	58.19 %	57.25 %	57.87 %
	<u>100.0 %</u>	<u>100.0 %</u>	<u>100.0 %</u>	<u>100.0 %</u>

Inland waterway and road transport count together for  $\pm$  95% of total transport. Total transport in levels and growth rates is given in Table 29.

TABLE 29: TOTAL TONNAGE TRANSPORTED

(FIGURES IN BRACKETS ARE GROWTH RATES)

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	34.78(6.1%)	35.74(2.8%)	33.31(-6.8%)	32.9(-1.2%)
<u>Rail</u>	4.94(11.4%)	4.81(-2.6%)	4.75(-1.2%)	4.6(-3.2%)
<u>Inland Waterway</u>	54.81(-4.7%)	56.44(3.0%)	50.98(-9.7%)	51.6(1.2%)
<u>Total</u>	94.53(-0.22%)	96.99(2.6%)	89.05(-8.2%)	89.1(0.2%)

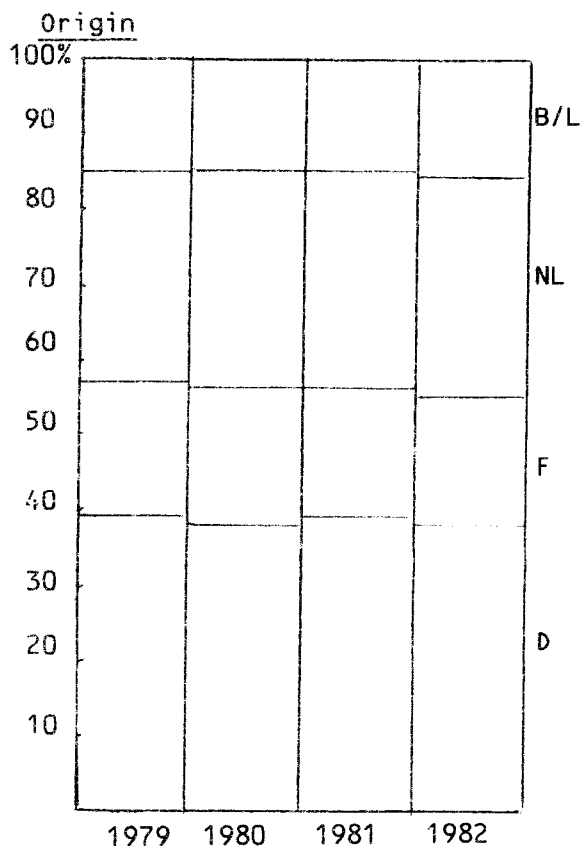
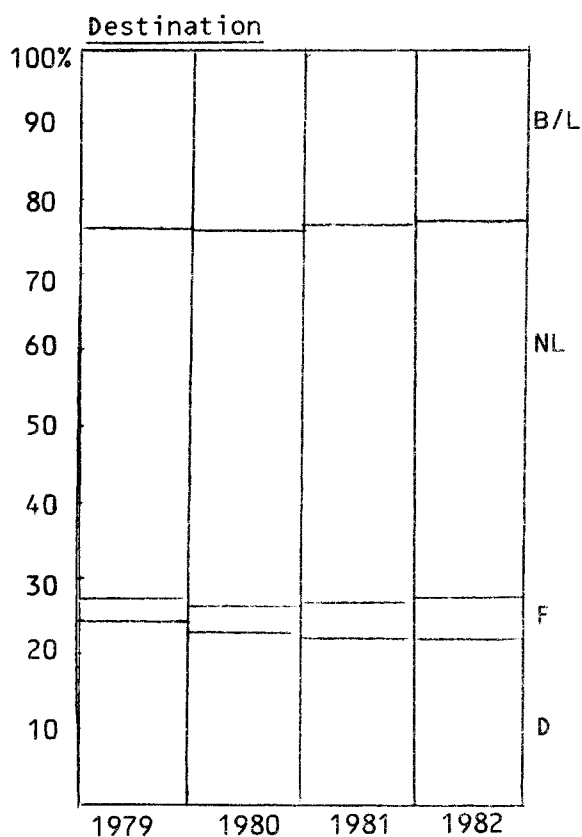
For all the modes taken together 1981 was a year of serious crisis, with a fall in activity of over 8%. For 1982 more improvement is expected, although this will not be sufficient to restore activity to the pre-1981 level.

The relative importance of NST 6 in total transport for each mode is given in Table 29. It appears that this kind of transport represents about one fifth of the total road transport and between one third and one quarter of total activity of inland waterway transport. In 1981, the relative importance of this NST group has fallen for both modes, since the building industry was hit more severely by the recession than the average of the Community.

### 7.3. Geographical pattern of transport

GRAPH 33: Inland Waterway  
(outward)

GRAPH 34: Inland Waterway  
(inward)



In the case of inland waterways, Rhine traffic and North-South traffic are both important for the transport of these goods. The relative importance of both traffics is given in Table 30.

TABLE 30: RELATIVE IMPORTANCE OF RHINE AND NORTH-SOUTH TRAFFIC

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Rhine</u>	63.13%	60.93%	61.17%	60.18%
<u>North-South</u>	36.87%	33.07%	38.83%	39.82%
	100.0%	100.0%	100.0%	100.0%

The higher tonnage is transported by the Rhine traffic. The most important routes for Rhine traffic are from Germany to the Netherlands and from France to Germany (in 1982, 60% and 21% respectively).

The most important route on the North-South traffic is from the Netherlands to Belgium and from Belgium to the Netherlands (in 1982, 55.5% and 31.0% respectively).

## 8. Carriage of NST 7 goods

### 8.1. Type of goods

This category contains fertilizers: natural and chemical.

### 8.2. General developments

For all modes, transport of these goods is relatively unimportant. It represents only 2.8% of total transport.

Most of it is transported by inland waterways (although its weight in total inland waterway transport is only 3.5% in 1982).

TABLE 31: MODAL SPLIT OF NST 7

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	17.12%	19.94%	21.17%	21.54%
<u>Rail</u>	23.07%	22.22%	21.67%	22.07%
<u>Inland Waterway</u>	59.81%	57.84%	57.16%	56.39%
	100.0%	100.0%	100.0%	100.0%

Total tonnage transported by each mode and the corresponding annual growth rates are given in Table 32.

TABLE 32: TOTAL TONNAGE TRANSPORTED (MIO T)

(FIGURES IN BRACKETS ARE GROWTH RATES)

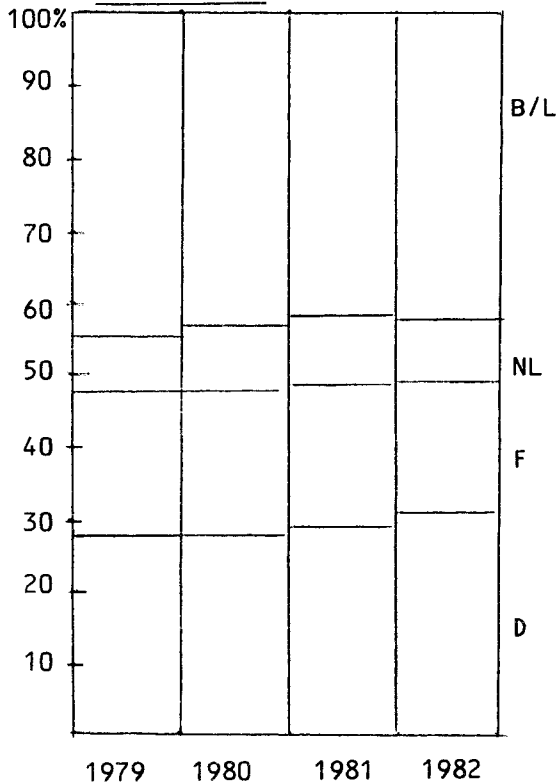
<u>Road</u>	2.12(8.7%)	2.38(12.5%)	2.45(2.9%)	2.59(5.7%)
<u>Rail</u>	2.85(11.0%)	2.65(-7.0%)	2.51(-5.5%)	2.65(5.8%)
<u>Inland Waterway</u>	7.40(7.1%)	6.91(-6.6%)	6.61(-4.2%)	6.78(2.5%)
<u>Total</u>	12.36(8.3%)	11.90(-3.4%)	11.57(-3.1%)	12.00(3.9%)

Transport by road of these goods has increased rapidly. For the years 1981 and 1982 the growth rate has remained positive. This has resulted in an increase of market share for road transport from 17.12% in 1979 to 21.54% in 1982.

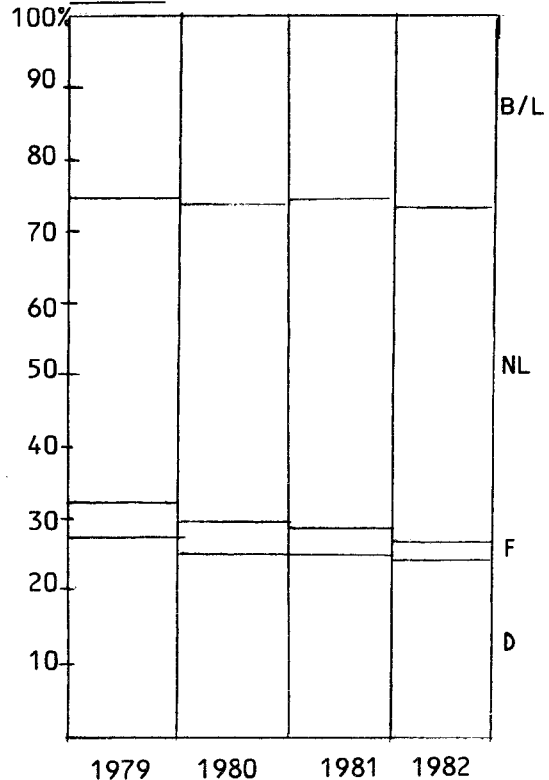
### 8.3. Geographical pattern of transport

Since the largest quantity is transported by inland waterway (56.4% in 1982), it is interesting to analyse the geographical distribution of the transport flows by this mode.

GRAPH 34: Inland Waterway Traffic (outward)  
Destination



GRAPH 35: Inland Waterway Traffic (inward)  
Origin



By far, the most important exporter is the Netherlands (in 1982: 49.6% of the total exports). Also important are Belgium/Luxembourg (1982: 26%) and Germany (1981: 21.8%).

Important bilateral flows take place from the Netherlands towards Belgium/Luxembourg and Germany; also from Germany to Belgium.

## 9. Carriage of NST 8 goods

### 9.1. Type of goods

This category includes the chemical products: basic chemicals; aluminium oxide and hydroxide, coal chemicals, paper pulp and waste paper, other chemical products.

### 9.2. General development

Transport of these goods takes place mainly by road (around 65%) (see Table 33).

TABLE 33: MODAL SPLIT OF NST 8

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	62.65%	65.18%	65.33%	65.39%
<u>Rail</u>	11.87%	11.47%	11.18%	11.30%
<u>Inland Waterway</u>	25.48%	23.35%	23.49%	23.31%
	100.00%	100.00%	100.00%	100.00%

The relative share of road transport is slowly increasing during the four-year period of analysis. Also important is transport by inland waterway, although there is a slight tendency to loose share.

TABLE 34: TOTAL TONNAGE TRANSPORTED  
(FIGURES IN BRACKETS ARE GROWTH RATES)

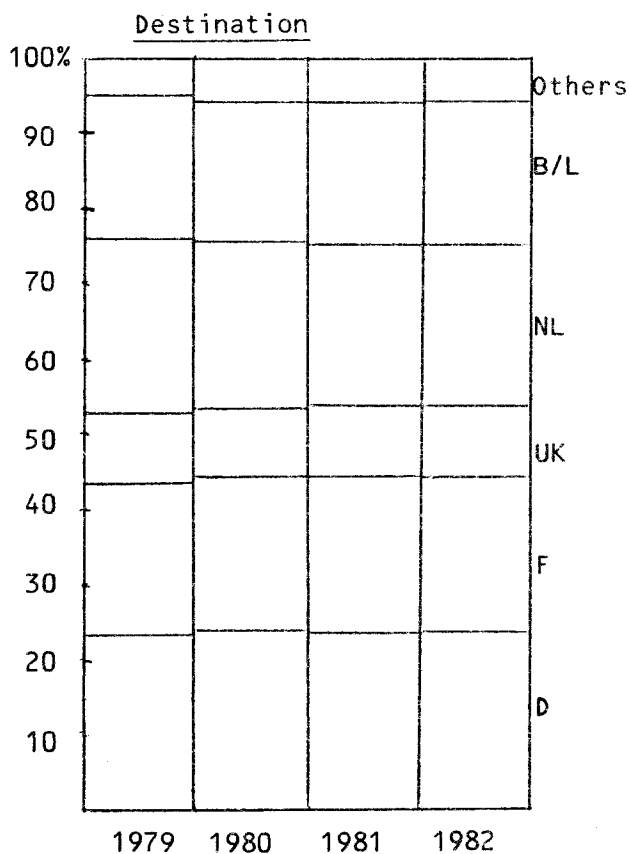
	1979	1980	1981	1982
<u>Road</u>	23.6(8.4%)	23.7(0.6%)	23.4(-1.4%)	24.4(4.1%)
<u>Rail</u>	4.5(28.9%)	4.2(-6.6%)	4.0(-4.2%)	4.2(5.2%)
<u>Inland Waterway</u>	9.6(15.2%)	8.5(-11.4%)	8.4(-1.1%)	8.7(3.2%)
<u>Total</u>	37.7(12.2%)	36.4(-3.3%)	35.8(-1.7%)	37.2(4.0%)

It should be said that while transport by rail and transport by inland waterway grew negatively both in 1980 and 1981, growth of transport by road was negative only in 1981.

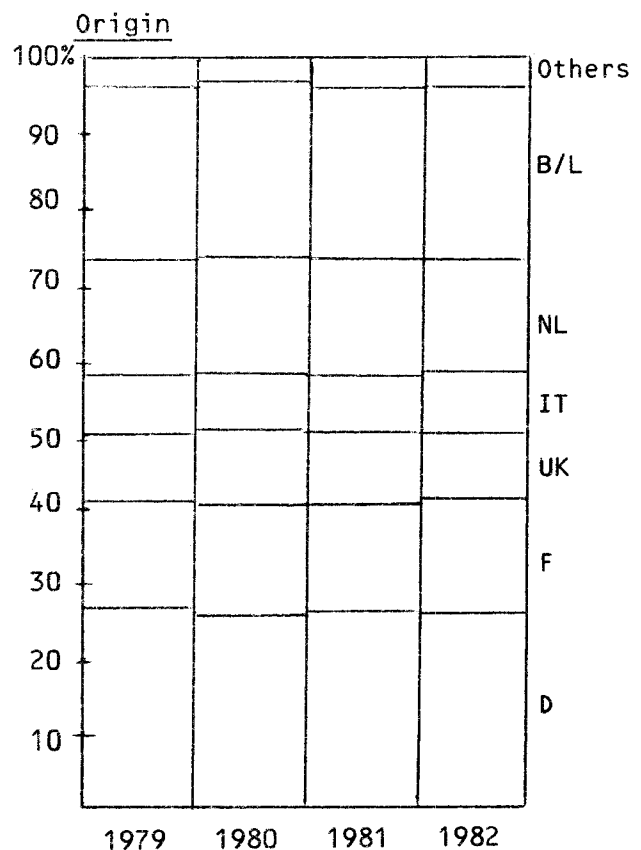
For 1982 it has been forecasted that growth will be positive for all transport modes.

### 9.3. Geographical pattern of transport

GRAPH 36: Road Traffic (outward)



GRAPH 37: Road Traffic (inward)



The most important countries of origin of road transport for these goods are Germany, Belgium/Luxembourg, the Netherlands and France.

The most important flows go from Belgium to France and Germany, from the Netherlands to Germany, from France to Germany and from Germany to the Netherlands, France and Belgium.

## 10. Carriage of NST 9 goods

### 10.1. Type of goods

NST 9 contains a wide range of products: vehicles and transport equipment, agricultural machinery, parts, engines, manufactured articles, glass, glassware and ceramic products, textiles, other manufactured articles, miscellaneous articles.

### 10.2. General developments

Road transport is the most important mode for this category of goods. No other NST group has such a relative high share (see Table 35).

TABLE 35: MODAL SPLIT OF NST 9

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	73.76 %	73.00 %	72.99 %	73.45 %
<u>Rail</u>	19.41 %	19.81 %	19.69 %	19.30 %
<u>Inland Waterway</u> ,	6.83 %	7.19 %	7.32 %	7.25 %
	<u>100.0 %</u>	<u>100.0 %</u>	<u>100.0 %</u>	<u>100.0 %</u>

In the case of road transport, these goods represent nearly one quarter of total transport by this mode (in 1982: 23%). For the other modes of transport, this category reaches 13.5% of the total for rail and only 2.0% for inland waterways (see Table 36).

TABLE 36: SHARE OF NST 9 IN TOTAL TRANSPORT

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	22.7%	22.5%	22.8%	22.9%
<u>Rail</u>	11.9%	13.3%	14.2%	13.5%
<u>Inland Waterway</u>	1.7%	1.9%	2.0%	2.0%
<u>All modes</u>	11.4%	11.8%	12.1%	12.0%

The total tonnage of NST 9 shows a less cyclical variation than is the case for the other NST categories (see Table 37).

TABLE 37: TOTAL TONNAGE TRANSPORTED (MIO TONNES)

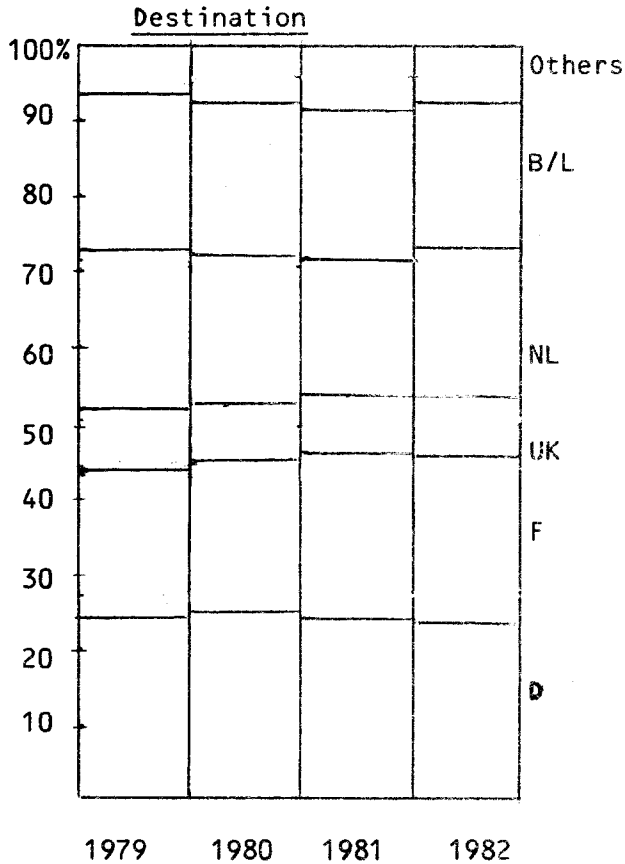
(FIGURES IN BRACKETS ARE GROWTH RATES)

	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>Road</u>	36.01(9.4%)	36.84(2.3%)	36.71(-0.3%)	38.20(4.1%)
<u>Rail</u>	9.48(15.9%)	10.00(5.5%)	9.90(-1.0%)	10.04(1.4%)
<u>Inland Waterway</u>	3.33(7.4%)	3.63(8.9%)	3.68(+1.5%)	3.77(2.5%)
<u>All modes</u>	48.81(10.4%)	50.47(3.4%)	50.30(-0.3%)	52.01(3.4%)

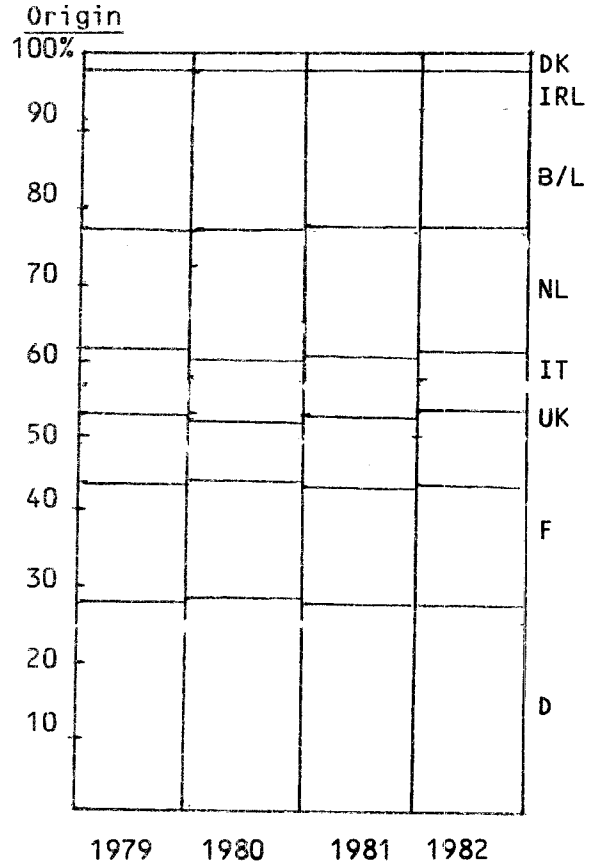


10.3. Geographical pattern of transport

GRAPH 39: Road Traffic (outward)



GRAPH 40: Road Traffic (inward)



The most important countries of origin are Germany (27.6%), Belgium (20.6%), the Netherlands (16.1%) and France (15.4%). Important countries of destination are Germany (23.6%), France (21.2%), the Netherlands (19.7%) and Belgium/Luxembourg (19.5%). The spread of transport flows for NST 9 goods is more even throughout the Community than is the case for the other NST groups.

It is mainly in this category of goods that competition between industrial countries takes place. For this reason, transport demand for these goods can be derived from and explained by the same variables that determine bilateral trade of goods, i.e. final demand and relative prices (competitiveness).

STATISTICAL ANNEX

Table 1

## International goods traffic between the Member Countries of the EC

(Metric tonnes)

Mode of Transport : road + rail + inland waterway

NST: 0 - 9

Year	IRL	DK	B/L	NL	F	UK	F	D	EC
1979	3575	52557	76981	8398	733275	81588	36174		992548
1980	4016	67711	93488	7578	446017	99445	45731		763986
1981	3391	54954	90487	7359	442250	95798	39226		723465
1979	8331	163784	226792	251948	518998	233192	2946218		4349263
1980	8557	166342	239574	258342	606902	268060	3092547		4640324
1981	10351	166850	235950	262096	602193	277739	3344397		4899576
1979	61199	273580	23664800	2656492	2243952	23558445	22685074		75143542
1980	58651	259112	25172500	2596055	2280245	25325130	22582376		78274069
1981	67958	260807	25870159	2547695	2298902	24354314	22281736		77681571
1979	30305	3615000	1562828	2459428	2459428	9166078	88379092		138088068
1980	27399	38478700	1618947	2447826	2447826	10996624	85945100		139613181
1981	29128	37200018	1665872	2459461	2459461	10002591	83863793		135634324
1979	166	1363798	1046513	429692	429692	5522479	7517798		16044585
1980	384	1256443	1125315	434779	434779	5386983	7687870		16020183
1981	530	1221321	1182657	444951	444951	5079645	7617349		156663755
1979	651422	588918	1888342	304381	304381	1284006	707418		8010625
1980	649207	2673405	1858481	313302	313302	1304346	772637		8018780
1981	646110	2669359	1851894	312501	312501	1609529	770095		83244807
1979	47242	319019	6075124	11960844	1795874	1795874	29920582		79036036
1980	50541	325348	6303554	12429609	164441	164441	30156877		76919945
1981	60965	344288	6181974	11913952	1594594	1594594	28825597		73135567
1979	28217	2279609	51149665	9185269	1010932	21122791	111230202		111230202
1980	28110	2166951	50079261	10038082	945451	20305430	107252003		107252003
1981	30725	2277916	49350304	10470605	1020872	18574154	103899103		103899103
1979	826882	4004177	84128217	25930160	9192151	60968579	152192356		432894869
1980	822849	3729823	84872173	2761915	8805631	533866018	150313138		431502471
1981	847767	3680484	84763425	27180080	8863223	59983770	146742193		419962168

Source : IFO - INSTITUT

ALL MODES (1982)

Table 1 : Continued

FROM	IRL	DK	B/L	NL	IT	UK	F	D	EC
TO									
IRL		4.036	57.670	91.690	7.366	422.125	80.00†	38.426	701.314
DK	9.464		165.586	239.185	268.700	616.197	281.180	3.442.416	5.022.728
B/L	70.220	256.810		26.702.626	2.554.602	2.350.849	25.127.656	22.286.844	79.349.607
NL	30.073	416.857	36.993.548		1.690.195	2.440.678	10.363.510	83.095.662	135.030.523
IT	598	119.150	1.194.948	1.187.029		429.887	5.000.834	7.471.205	15.403.651
UK	663.450	483.660	2.759.164	1.872.018	310.795		1.675.601	714.554	8.479.242
F	73.025	366.506	24.592.451	6.680.576	11.730.489	1.561.886		28.925.561	73.930.494
D	32.804	2.341.068	21.959.136	49.612.534	10.676.701	1.008.390	18.710.777		104.341.410
EC	879.634	3.988.087	87.722.503	86.385.658	27.238.848	8.830.012	61.239.559	145.974.668	422.258.969

Source: Commission Services.

Table 2

International goods traffic between the Member Countries of the EC  
(metric tonnes)

Mode of transport : road

NST : 0 - 9

	Year	IRL	DK	B/L	NL	IT	UK	F	D	EC
IRL	1979	XXXXXXXXXX	3247	52297	76981	6672	733275	80932	36174	989578
	1980	XXXXXXXXXX	3975	67353	93488	6829	446017	97807	45731	761200
	1981	XXXXXXXXXX	3222	54356	90487	6701	442250	85778	39226	722020
DK	1979	XXXXXXXXXX	6795	110522	224000	201421	512625	215711	2711069	3982143
	1980	XXXXXXXXXX	7615	109183	235000	196178	603062	248141	2842558	4241737
	1981	XXXXXXXXXX	9095	108670	233000	194981	597914	258712	3074615	4476987
B/L	1979	XXXXXXXXXX	59864	XXXXXXXXXX	963000	1198932	2171397	13229147	9008299	35506401
	1980	50123	206526	XXXXXXXXXX	9746000	1346835	2213574	15165500	9237793	37966351
	1981	58318	204275	XXXXXXXXXX	9690000	1311473	2232939	14911308	8907885	37316198
NL	1979	30305	365000	8307000	XXXXXXXXXX	1333138	2459428	3886137	14178733	30559741
	1980	27399	366000	8579000	XXXXXXXXXX	1354185	2447826	4121980	14620074	31536464
	1981	29128	401800	8589000	XXXXXXXXXX	1386519	2459461	4119518	14289829	31274455
IT	1979	150	141503	808330	635256	XXXXXXXXXX	21720	3861731	5160363	10623053
	1980	184	114206	735477	646641	XXXXXXXXXX	20996	3884258	5371566	10773128
	1981	236	104236	734668	654688	XXXXXXXXXX	21362	3762459	5431266	10708915
UK	1979	651427	586845	2546199	1888342	70210	XXXXXXXXXX	1232348	620780	7596146
	1980	649207	446017	2597216	1858481	71508	XXXXXXXXXX	1254435	666413	7543277
	1981	648110	461563	2594120	1851894	70746	XXXXXXXXXX	1515606	567293	7709334
F	1979	43684	241767	11716125	2391014	4382343	1596391	XXXXXXXXXX	12159385	32530709
	1980	47439	259084	11454075	2447574	4885681	1513926	XXXXXXXXXX	12707336	33315115
	1981	57597	276830	10871169	2610933	4594783	1465402	XXXXXXXXXX	12350075	32226789
D	1979	28136	167619	8461696	16615150	4710218	846294	XXXXXXXXXX	8061172	40399585
	1980	27679	1595342	8384607	16399207	5049534	796663	XXXXXXXXXX	8419556	40872718
	1981	30584	1688084	8232675	16047525	5175645	804670	XXXXXXXXXX	8352310	40331493
EC	1979	820356	3224043	32002169	31460743	11902934	8341130	30567178	43874803	162193356
	1980	809646	3011150	32126911	31426391	12910750	8022064	33191807	45491471	167010190
	1981	833068	3139210	31184658	31178527	12740850	8023998	33005691	44660189	164766191

Source : IFO - INSTITUT

Table 2 : Continued

## ROAD(1982)

FROM	IRL	DK	B/L	NL	IT	UK	F	D	EC
TO									
IRL		3.920	57.184	91.690	6.579	422.125	80.001	38.426	699.925
DK	8.278		110.376	236.389	196.838	612.129	264.443	3.170.563	4.599.016
B/L	61.212	202.764		9.946.934	1.335.185	2.287.795	15.456.005	8.967.544	38.257.439
NL	30.073	405.197	8.692.739		1.424.520	2.440.678	4.226.076	14.436.721	31.560.004
IT	279	106.247	744.794	647.047		22.312	3.691.033	5.413.026	10.624.735
UK	663.450	482.007	2.687.723	1.872.018	74.155		1.580.131	529.340	7.888.824
F	69.544	298.046	11.137.004	2.725.469	4.616.409	1.450.493		12.819.311	33.116.276
D	32.804	1.779.621	8.406.045	16.168.311	5.285.557	795.499	8.537.262		41.005.100
EC	865.637	3.277.802	31.835.866	31.687.858	12.939.243	8.031.031	33.834.951	45.374.931	167.847.319

Source: Commission Services.

Table 3

International goods traffic between the Member Countries of the EC (Metric tonnes)

Mode of transport : rail

NST : 0 - 9

Year	IRL	DK	B/L	NL	IT	UK	F	D	EC
1979	320	326	1726	656	235149	3936760	13937732		
1980	41	358	749	1638	17481	6585904	3708449	0	2970
1981	169	598	658	20	19919	6246723	3402405	0	2786
1979	1536	53262	50527	6373	19027	5433172	235149	0	1445
1980	942	57159	62164	3840	17481	6585904	249989	0	367120
1981	1256	58180	67115	4279	19919	6246723	269782	0	398587
1979	1335	1818800	1457360	72555	17481	6585904	269782		422589
1980	8528	1689500	1249220	66671	19919	6246723	269782		398587
1981	9640	1587117	1236222	65963	19027	5433172	269782		422589
1979	1337	1606000	229690	786903	72555	6585904	3936760		13937732
1980	1285	1947700	264762	912069	66671	6246723	3708449		13001677
1981	12461	2161814	279353	908963	5433172	5433172	3402405		11791051
1979	16	555468	411257	478674	407972	1660748	2357435		5415532
1980	200	520966	478674	527969	413783	1502725	2316304		5246855
1981	294	486653	527969	423589	423589	1317186	2186083		4954840
1979	2073	39939	234171	51658	86638	51658	86638		414479
1980	1385	76189	241794	49911	106224	49911	106224		475503
1981	1756	75239	241753	93923	202802	93923	202802		615473
1979	3558	13032880	7578501	199483	6561654	6561654	28086395		28086395
1980	3102	10854724	7543928	130485	6513652	6513652	25723950		25723950
1981	3368	9757092	7319169	129192	5784546	5784546	23562997		23562997
1979	81	7483336	4475051	164638	9694811	9694811	24663591		24663591
1980	431	5956940	4988548	148788	9072165	9072165	22805851		22805851
1981	141	5018547	5294960	216502	7542410	7542410	20899347		20899347
1979	6526	22771145	14027226	851021	18799161	18799161	79972174		79972174
1980	13203	19414036	14351165	763567	17805150	17805150	75432300		75432300
1981	14699	17559123	14439230	839225	15314701	15314701	70134274		70134274

Source: IFO - INSTITUT Symbols : "." = figure not available "0" = negligible

Table 3 : continued

RAIL (1982)

FROM	IRL	DK	B/L	NL	IT	UK	F	D	EC
TO									
IRL		116	486	-	787	-	0	0	1.389
DK	1.186		55.210	2.796	71.862	4.068	16.737	271.853	423.712
B/L	9.008	54.046		1.487.397	1.219.417	63.054	5.208.703	3.218.001	11.259.626
NL	-	11.660	2.248.660		265.675	-	966.924	4.835.453	8.328.372
IT	322	12.903	450.154	539.982		407.575	1.309.801	2.058.179	4.778.916
UK	-	1.653	71.441	-	236.640		95.470	185.214	590.418
F	3.481	68.460	9.708.613	461.818	7.114.080	111.393		5.739.070	23.206.915
D	0	561.447	4.886.050	2.266.660	5.391.144	212.891	7.553.445		20.871.637
EC	13.997	710.285	17.420.614	4.758.653	14.299.605	798.981	15.151.080	16.307.770	69.460.985

Source: Commission Services.



Table 4

International goods traffic between the Member Countries of the EC  
(Metric tonnes)

Mode of transport : inland waterway

NST : 0 - 9

Year	IRL	DK	B/L	NL	IT	UK	F	D	EC
1979	XXXXXXXXXX	-	-	-	-	-	-	-	-
1980	XXXXXXXXXX	-	-	-	-	-	-	-	-
1981	XXXXXXXXXX	-	-	-	-	-	-	-	-
1979	XXXXXXXXXX	XXXXXXXXXX	-	-	-	-	-	-	-
1980	XXXXXXXXXX	XXXXXXXXXX	-	-	-	-	-	-	-
1981	XXXXXXXXXX	XXXXXXXXXX	-	-	-	-	-	-	-
1979	-	-	XXXXXXXXXX	12216000	-	-	3743394	9740015	25699409
1980	-	-	XXXXXXXXXX	13757000	-	-	3912907	9636134	27306041
1981	-	-	XXXXXXXXXX	14593042	-	-	4099634	9971446	28574322
1979	-	-	26202000	XXXXXXXXXX	-	-	4493036	69748934	100443972
1980	-	-	27952000	XXXXXXXXXX	-	-	5662575	66685051	10299626
1981	-	-	26449204	XXXXXXXXXX	-	-	4974110	65050023	98473337
1979	-	-	-	-	XXXXXXXXXX	-	-	-	-
1980	-	-	-	-	XXXXXXXXXX	-	-	-	-
1981	-	-	-	-	XXXXXXXXXX	-	-	-	-
1979	-	-	-	-	-	XXXXXXXXXX	-	-	-
1980	-	-	-	-	-	XXXXXXXXXX	-	-	-
1981	-	-	-	-	-	XXXXXXXXXX	-	-	-
1979	-	-	4168346	3051043	-	-	XXXXXXXXXX	1119943	18418932
1980	-	-	3678806	3244165	-	-	XXXXXXXXXX	10965889	17880880
1981	-	-	3585936	3068869	-	-	XXXXXXXXXX	10690976	17345781
1979	-	-	10508687	32291531	-	-	3366808	XXXXXXXXXX	46167026
1980	-	-	9147171	31612684	-	-	2813579	XXXXXXXXXX	43573434
1981	-	-	8923305	31065524	-	-	2679434	XXXXXXXXXX	42563263
1979	-	-	48679033	47588574	-	-	11603240	90688492	19029339
1980	-	-	40769977	46613869	-	-	10389061	87287074	19859981
1981	-	-	39958445	48727435	-	-	11563378	85712445	185061703

Source : IFO - INSTITUT Symbols : " - " = Nil

INLAND WATERWAYS (1982)

Table 4 : Continued

FROM	IRL	DK	B/L	NL	IT	UK	F	D	EC
TO									
IRL									
DK									
B/L				15.268.295			4.462.948	10.101.299	29.832.542
NL			26.052.149				5.170.510	63.823.488	95.046.147
IT									
UK									
F			3.746.834	3.493.289				10.367.180	17.607.303
D			8.667.040	31.177.563			2.620.070		42.464.673
EC			38.466.023	49.939.147			12.253.528	84.291.967	184.950.665



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