

EUROPEAN ECONOMY

COMMISSION OF THE EUROPEAN COMMUNITIES • DIRECTORATE-GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS

**Competitiveness of European industry:
situation to date**

**The determinants of supply in industry
in the Community**

**The development of market services
in the European Community,
the United States and Japan**

**Technical progress,
structural change and employment**

No 25 September 1985

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- Series A—'Economic trends' appears monthly except in August and describes with the aid of tables and graphs the most recent trends of industrial production, consumer prices, unemployment, the balance of trade, exchange rates, and other indicators. This supplement also presents the Commission staff's macroeconomic forecasts and Commission communications to the Council on economic policy.
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Abbreviations and symbols used

Countries

B	Belgium
DK	Denmark
D	Federal Republic of Germany
GR	Greece
F	France
IRL	Ireland
I	Italy
L	Luxembourg
NL	The Netherlands
UK	United Kingdom
EUR 10	Total of the Member States of the European Community
EUR 9	Community without Greece

Currencies

BFR	Belgian franc
DKR	Danish krone
DM	German mark
DR	Greek drachma
FF	French franc
IRL	Irish pound (punt)
LIT	Italian lira
LFR	Luxembourg franc
HFL	Dutch guilder
UKL	Pound sterling
ECU	European currency unit
USD	US dollar
SFR	Swiss franc
YEN	Yen
CAD	Canadian dollar
ÖS	Austrian schilling

Other abbreviations

ACP	African, Caribbean and Pacific countries
ECSC	European Coal and Steel Community
EDF	European Development Fund
EIB	European Investment Bank
EMCF	European Monetary Cooperation Fund
EMS	European Monetary System
ERDF	European Regional Development Fund
Euratom	European Atomic Energy Community
Eurostat	Statistical Office of the European Communities
GDP (GNP)	Gross domestic (national) product
GFCF	Gross fixed capital formation
mio	Million
NCI	New Community Instrument
OCTs	Overseas Countries and Territories
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of Petroleum Exporting Countries
SMEs	Small and medium-sized enterprises
SOEC	Statistical Office of the European Communities
toe	Tonnes of oil equivalent

General synopsis

With 11,2 % of the labour force unemployed in the Community in 1985, the economic crisis has taken a heavy toll. Unemployment in the Community is much higher than in the United States (7,3 %) and especially Japan (2,5 %), and there is no sign of it falling in the near future. Within the Community, conditions in the different sectors of activity are a source of even greater despondency. Since the beginning of the 1970s, most of the larger sectors of activity (agriculture, industry, construction) have significantly reduced their workforces. At the same time, services, especially those linked to general government, have, it is true, created millions of extra jobs, but still not enough to provide work for all those seeking work. Along with Japan, the United States, where the business cycle has fluctuated widely and a greater number of people have moved in and out of the labour force, has throughout demonstrated its ability to generate employment for the bulk of the population. Between 1972 and 1982, for example, an extra 19 million people found jobs in the United States and an extra 6 million in Japan, whereas total employment in the Community rose by only 60 000.

This curtailing of the job-creation process, and its adverse impact on the development of unemployment, provides the most tangible evidence of the seriousness of the adjustment crisis which is now facing the Community and which, when account is taken of developments in the main industrial areas of the world, is more European than global in nature.

On the basis of a comparison of the economic performances in the Community, the United States and Japan, analysed by sector, the following chapters describe the main structural developments over the last 15 years and attempt to assess what the main explanatory factors have been. They also look at the situation in industry, the new economic role played by market services, and the impact of technological progress on structural change. The main conclusions present a consistent picture thus:

- (i) The Community has not performed as well as its trading partners in the growth sectors, i.e. those most closely linked to new technologies, and its competitiveness in those sectors has deteriorated both on world markets and on the internal market.
- (ii) In contrast, in the Community, the weak-demand sectors, or those less subject to the pressures of international competition have maintained, if not improved their positions. This shift towards products less sensitive to a recovery in economic activity has contributed, to an important extent, to the worsening of the employment situation.

In the Community, the unsatisfactory allocation of the factors of production has become more marked. The diffusion of productivity and other gains through the production system has been hampered and the rate of job creation sharply curtailed. In the United States and especially in Japan, the 'exposed sectors' and the 'sheltered sectors' have played quite different roles, thereby ensuring a more satisfactory overall economic performance; the former have concentrated on safeguarding their cost effectiveness and have launched a major investment drive, while the latter have recorded moderate productivity gains with an accompanying rise in employment.

Chapter 1: Competitiveness of European industry: situation to date

Since 1973, the rate of growth of world demand for industrial products has slowed down, intensifying international competition as each manufacturer has endeavoured to hold on to or increase market shares.

Demand for some manufactured products with a high new-technology content has, however, been extremely firm, expanding by 6-7 % a year in volume terms, or two to three times faster than demand for other products. Those countries well placed to meet this demand, particularly because of their competitive edge, were certain to enjoy a more satisfactory growth performance.

An analysis of the performances of recent years shows clearly that Community industry has been unable to take advantage of the opportunities offered. In the case of the strong-demand products, it has managed neither to satisfy fully the needs of European consumers, nor to expand its outlets worldwide. As a result, in terms of total internal demand in the Community, the rate of penetration by high-technology products from outside the Community rose from 7 % to 17 % between 1972 and 1982, whilst over the same period the corresponding figures for the United States and Japan were 10 % and 5 % respectively. At the same time, in spite of an increased export drive, the Community's share of the world market contracted from 28 % in 1972 to 25,7 % in 1982, while the shares accounted for by US and Japanese producers expanded. This resulted in a slow but steady fall in the cover ratio of Community imports by Community exports. Moreover although the import cover rate for Community industry remains high, the high-technology sectors are contributing less and less to trade surpluses.

This analysis of trade flows paints a fairly accurate picture of conditions in European industry. In the high-technology sectors (electrical equipment and electronics, information

technology and automated office machinery, precision and measuring equipment, and chemicals and pharmaceuticals), European products are not sufficiently competitive, and this has led to a growing import dependence on products manufactured in the United States, Japan and certain countries of South-East Asia and to less emphasis being placed on high-technology exports. On the other hand, Community producers perform best in markets for the more traditional, industrial, but weak-demand products, and they are concentrating more and more on exporting their products to areas where competition is less keen (other OECD countries, State-trading countries, OPEC countries). This increase in emphasis on products that are less sensitive to economic activity and that have a lower value-added content has, almost certainly, contributed to the lower growth rates observed in Europe and to a deterioration in the employment situation in industry. This is particularly worrying since the Community is more dependent on international trade than its partners.

Chapter 2: The determinants of supply in industry in the Community

This chapter attempts to find an explanation for the developments noted in Chapter 1 based in particular on a study of the allocation of the factors of production (labour and capital) in the three economic areas surveyed.

It should first be noted that, not only is European industry poorly represented in the high-technology sectors but the latter are also growing more slowly in the Community than in its main trading partners. These sectors accounted for only 20 % of industrial value-added in the Community in 1982, compared with just under 30 % in the United States and Japan. Over a 10-year period, they grew at an annual rate in volume terms of 3,3 %, compared with 3,7 % in the United States and 12,2 % in Japan. The situation is deteriorating further, especially as demand for these products remains sluggish.

An initial analysis, even at the sectoral level, of the trends of labour costs and capital accumulation in the three areas reveals marked differences. Although it is still not possible to establish any direct causal relationships, the divergences observed throw some light on the reasons why the crisis in the Community is so deep-seated.

Taking comparative labour costs, for example, the sectoral data available highlight a series of major structural differences between the Community, the United States and Japan:

- (i) For any particular occupational category, differences in hourly labour costs within manufacturing in the Com-

munity are slight, whichever Member State we look at; the dispersion is, in fact, half that observed in the United States or Japan.

- (ii) Over time, this wage dispersion has tended to narrow, particularly in countries providing a guaranteed minimum wage or applying inflation indexing to wages.
- (iii) The rigidity of employment between sectors is also more marked in the Community countries, while individuals in the United States and Japan have found it easier to move between sectors, given the prospect of higher earnings for the same level of occupational skill.

Movements in labour costs since 1973 are also highly instructive in this respect:

- (i) During the period 1973-82, growth in real wages per capita in European industry (2,9 % a year on average) was mid-way between that in the United States (1,1 %) and Japan (4,2 %). Between 1982 and 1985, however, there has been an unmistakable slowdown in real wage increases per capita in Community industry (1,2 % a year on average), unlike in the United States and Japan, where the trend discernible in the preceding period has continued (1,7 % and 4,7 % respectively).
- (ii) The trend in real unit labour costs (defined as the ratio of real wages to productivity) differs a great deal between sectors. The weaker the demand that a particular sector has experienced, the more unfavourable the situation has become. Even so, the disparities in unit labour costs between sectors are much more pronounced in Japanese industry than in Community industry. Taking the period 1973-82, the disparity in the growth of unit labour costs between strong-demand and weak-demand sectors was 7,1 % a year on average in Japan and 1,6 % in the Community. Cost performances in the weak-demand sectors are much the same in the Community as in the United States and Japan. As a result, Japanese industry enjoys a significant cost advantage in the high-technology, strong-demand sectors.
- (iii) Expressed in terms of a common currency, changes in relative unit labour costs can be amply explained by exchange rate movements. The reversal in trend that took place in 1980 was due to the fact that, between 1974 and 1980, the ECU appreciated markedly against its trading partners' currencies before depreciating again. In 1985, relative labour costs in the Community, expressed in terms of a common currency, are estimated to be 28,7 % lower in the Community than they were in 1980, whereas they have risen sharply in the United States (by 50,5 % over the same period). In Japan,

they have fallen by only 1,3 %. The Community's cost competitiveness has thus improved appreciably. However, this position could be jeopardized if the present decline in the value of the dollar continues.

The recent improvement in real labour costs in industry in the Community (discernible since 1982) has resulted in a perceptible revival of industrial investment although this has by no means closed the investment gap that exists between the Community, on the one hand, and the United States and Japan, on the other. Not only had industrial investment in Europe fallen to a low level but the sectoral allocation of investment by sector of activity has created problems. Between 1972 and 1982, the growth of gross fixed capital formation (GFCF) for industry as a whole was 3,9 percentage points lower in the Community than in the United States, and 3,5 percentage points lower than in Japan. However, on examining the performance of strong-demand sectors during the same period, it will be seen that the disparity in annual growth rates for GFCF was 6,8 percentage points as between the Community and the United States and 4,9 points as between the Community and Japan. This can be put down to a combination of factors:

- (i) The gross rate of return on capital in industry fell more markedly in the Community than in the United States or Japan, and, moreover, it was in the pace-setting sectors (high technology and strong demand) that the decline was largest. Furthermore, in terms of levels, the gross rate of return on capital is probably lower in Europe, in the high-technology sectors, than in the other types of sector although in the United States or Japan profitability in these sectors is consistently higher than the average for industry.
- (ii) The appreciable fall in profitability itself results in part from a decline in capital productivity due to a reduction in working hours, which has not always been offset by a more intensive utilization of equipment and by the fall in rate of capacity utilization between 1973 and 1982.

Faced with falling profits, firms have endeavoured to reduce their wage bill and to cut back on investment. This lacklustre investment performance in Europe explains the weakness of the growth of the capital stock which has thus become old more quickly in Europe than in the United States or, above all, in Japan.

The pace of modernization of the structure of production has thus slowed down and the substitution of capital for labour, which has taken place in European industry, although more rapid than in the United States was less than in Japan, and was accompanied by even greater reductions in industrial employment.

An analysis of the trend of total factor productivity clearly illustrates the importance of the substitution process. In the weak-demand sectors, the increase in per capita productivity is due essentially to capital/labour substitution while, in the high-technology sectors, the rate of technological progress is the determining factor.

As a result, comparisons of the growth in total factor productivity as between the main economic areas (which can be likened to a measure of technological progress) is particularly instructive. The characteristics of Japanese industry are noticeably different from those in the other two economic areas and show clearly the priority accorded to high-technology sectors in Japan. The disparity in the growth of total factor productivity between the Community and Japan is pronounced in the high-technology sectors (with a growth rate of 8,1 % in Japan as against 2,6 % in the Community) and quite small in the moderate-demand sectors (growth of 1,8 % as against 1,3 %) whilst in the weak-demand sectors, Community industry is actually better placed than Japanese industry (0,7 % as against 0,1 %).

Community industry thus appears to be having some difficulty in assimilating technological innovations in the most dynamic sectors. This is all the more worrying as the investment trend in the Community is particularly unfavourable in these sectors when contrasted with the situation in the United States or Japan.

Chapter 3: The development of market services in the European Community, the United States and Japan

This chapter looks at the growing contribution being made by the market services sector to economic activity as a whole, in particular as indicated by an analysis of changes in the structure of value-added, employment and investment. This change is clearly confirmed for the Community and the United States but is less certain in Japan, (leaving aside the marked increase in service sector employment) where industry is becoming increasingly more important and continues to maintain a vigorous performance.

Nevertheless, the information available does not appear to bear out the idea that a de-industrialization process is under way in the major Western economies. Two main findings emerge:

- (i) Alongside the appearance of new services linked to technological progress, an extensive reallocation of certain activities previously carried on by industry to the service sector is taking place. This is confirmed by the increased

importance in all countries of the activity branch 'Business services provided to enterprises'. This change in structure is also typified by the extent to which the leasing of plant and machinery and other investments to industry by service firms has expanded. Such investments are recorded in services but affect industrial output.

- (ii) The key determinant of the growth of market services is demand by industry. It has been established that this finding, which it has been possible to test only for the Member States, holds good regardless of the particular Member State considered. In the Community of Six, for example, the first of the factors determining the growth of services appears to have been the increase in the consumption of services by industry, the second being the consumption of services by the service sector itself, and the third the final consumption of households (the growth in exports of services has been even more buoyant than industrial demand, but exports account for less than 8 % of total activity in the service sector).

The expansion of the service sector, which plays a key role in the creation of new jobs (5.1 million extra jobs created in the Community between 1970 and 1982), is thus closely tied up with the expansion of industry. The stronger and more competitive industry in the Community, the greater the contribution made by the service sector to assuring a satisfactory and balanced economic performance. As the service sector is made up largely of dynamic and innovative small and medium-sized businesses, it can provide the industrial fabric in Europe with the degree of flexibility which, according to the analysis made in Chapter 2, it appears to have lacked.

Chapter 4: Technological progress, structural change and employment

This chapter is somewhat different in nature from the other three. Abandoning the analytical approach, it attempts a more theoretical formulation of the relationships between research, product and process innovation, and structural adjustment and unemployment.

The faster pace at which new information technologies are being introduced has led to falling employment in production activities although, on examining job creation associated with new product innovation, there is no indication, for the OECD area as a whole, that technological change has

caused a net loss of jobs. The extent to which technological progress has created as well as suppressed jobs varies from one country to another, depending primarily on the recent trend in competitiveness and on the policy pursued with regard to research and new technologies. The Community is at present becoming less specialized exporting a whole range of products with a high intellectual and a high value-added content, particularly to markets that are the most demanding technologically.

Any hope of reducing long-term unemployment in the Community hinges on the latter's ability to encourage the development of new products and such products. The direct employment potential of high-technology industries is very low, probably accounting for barely 5 % of total employment, but their multiplier effects on other sectors are significant, especially where high-technology products are protected by intellectual property rights and international patents. The multiplier effects can, therefore, breathe fresh life into a large number of traditional production sectors, and the flexibility thereby brought about can have a major impact on regional development.

Even so, the Community's relative decline will not be arrested until such time as certain trends have been reversed:

- (i) Japan and the United States have mapped out long-term growth strategies based on an intensive programme of technological innovation. Such is not the case in the Community, where innovation, as a long-term determinant of growth, is not taken into account sufficiently in economic policy-making.
- (ii) The level of civil R&D spending in real terms, in Japan, is considerably underestimated. If account is taken of the real cost of R&D in Japan and of the duplication of efforts in Europe, it is currently approaching the level for the Community as a whole. It is less a matter of the Community stepping up its R&D spending as a proportion of GDP, than of the Community exploiting its size to the full by maximizing the degree of interaction between national and Community programmes.
- (iii) The Community must endeavour therefore to harness its human, scientific and technical potential fully by concentrating more of its research effort on programmes with a high employment potential.
- (iv) The Community's capacity to assimilate innovation must be fostered by creating a social and economic environment conducive to the proliferation of intellectual and risk capital.

Chapter 1: Competitiveness of European industry: situation to date

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Competitiveness of European industry: situation to date

Introduction

A country's industrial competitiveness rests on its ability to retain and expand its shares of world markets and to maintain a balance on its domestic market between imports and national output that is compatible with its export performance. This chapter looks at the trading performances of the Community, the United States and Japan since the first oil shock, sets out the findings arrived at and traces the broad trends shaping their growth prospects.

The approach adopted in this chapter focuses on the fact that, against a background of sluggish economic growth since 1973 that has been punctuated by successive economic upheavals, there has been an overall contraction in the growth of demand from firms and consumers; however demand for a limited number of industrial products has remained very buoyant, with growth rates reminiscent of the 1960s. In the face of such limited, yet dynamic opportunities, which were to expose them to stiffer international competition, the industrialized countries have had to speed up the process of adapting their productive systems. The more flexible, responsive to changes in the environment and innovative they have become, the better they have been able to adjust to structural changes in the pattern of demand redirecting, in step with these changes, their means of production to the growth sectors of the economy.

Thus for the Community, consolidation of future growth, and hence restoration of a higher level of employment in industry, depends on whether European firms are able to adapt to this changing pattern of demand. It is as if, relinquishing the strong positions it carved out coming to rely on less sophisticated products that are not so exposed to competition from the United States, Japan and the new producers in South-East Asia, but the demand for which is growing only sluggishly. The recent successes achieved by Europeans with some new technologies must not, however, be allowed to mask this general trend. The analysis made in this chapter brings clearly to light the dangerous slope down which European industry as a whole is now progressing.

1. Trend of demand in industrialized countries

The trend of domestic demand in the industrialized countries between 1972 and 1982 varied widely. Calculations in US dollars are made below for demand in nine industrialized countries, the nine being the United States, Japan, Germany, France, the United Kingdom, Italy, Belgium, the Netherlands and Denmark, which together account for over 80 % of the OECD's industrial output. Domestic demand was

ascertained in terms of supply, i.e. on the basis of output and imports and not of demand components (private consumption, investment, etc.). This is because manufacturers compete with one another on their different home markets, and in each country domestic demand is met by either domestic or foreign manufacturers.

The definition used is the conventional one: domestic demand = share of domestic output intended for the home market + imports; in other words, domestic demand = output - exports + imports. Defined in this way, domestic demand (or apparent consumption) is a much broader concept than final domestic demand since it also includes the intermediate consumption of enterprises and general government.

The annual growth in volume terms of domestic demand was obtained by deflating growth in value terms by the index of the prices of value-added in each sector. This is because no domestic demand deflator is generally available for each sector, but the comparisons made for the countries possessing data on the trend of demand in volume terms have shown that the approximation achieved yields highly comparable results, especially over a long period.

The analyses focus on industrial products generally, with agricultural and energy products thus being excluded. On the basis of an industrial breakdown by 13 sectors, it was possible to compare and classify them by reference to the growth rate of domestic demand in the 10-year period 1972-82.¹ In order to analyse and compare the individual countries, the growth rate of demand in the entire area comprising the countries of the Community,² the United States and Japan was calculated for each sector by weighting the growth in each country by domestic demand in respect of the sector in question expressed as a proportion of total domestic demand in the nine countries surveyed (see Table 1).

1.1 The three categories of demand

Taking the area made up by those nine countries, sectoral growth in domestic demand over the period 1978-82 falls into three clearly defined categories: strong demand, moder-

¹ The average annual growth rate is calculated on the basis of data smoothed over two years: average for 1981-82 compared with average for 1972-73.

² Throughout the text, unless otherwise stated, 'Community' should be understood to refer to the Federal Republic of Germany, France, the United Kingdom, Italy, the Netherlands, Belgium and Denmark, i.e. EUR 7, since full sectoral data have not been compiled for Ireland, Greece and Luxembourg.

ate demand, weak demand. These three categories will be systematically applied both in this chapter and in the ensuing chapter. Each industrial sector has thus been classified according to the demand category to which it belongs.

Strong-demand sectors: International demand in these sectors (electrical equipment and electronics, information technology and automated office equipment, precision instruments and chemicals and pharmaceuticals) expanded sharply, by an average of some 7% in volume terms each year despite the general slowdown in economic activity. It did not experience any genuine downward trend even after the contraction in the growth of GDP associated with the oil shocks.

Moderate-demand sectors: Demand in five sectors (rubber and plastics, transport equipment, paper pulp, packaging

and printing, food, drink and tobacco, and industrial machinery) showed little buoyancy, expanding by an average of 2%-3% a year. This category displays the most marked differences between the growth rates of domestic demand for each of the nine countries and those recorded by the area as a whole; the differences are particularly numerous in the case of the sectors producing capital goods.

Weak-demand sectors: In these sectors, demand grew by between 1% and 1,5% a year during the period under review, with relatively minor differences between countries. This trend was discernible primarily in the intermediate industries (steel, metal ores and metal goods, building materials, miscellaneous industrial products, and the textile, leather and clothing industries). This category includes all the traditional sectors with a high employment content, and it is here that the greatest number of jobs have been lost.

Table 1

Growth of domestic demand in volume terms (1982-72)¹
(in US dollars and at 1975 prices and exchange rates)
(classification based on growth rate for the area as a whole)

	B	DK	D	F	I	NL	UK	EUR 7	USA	Japan	EUR 7 + USA + Japan
<i>Strong-demand sectors</i>	6,0	3,9	4,9	5,7	7,1	6,1	2,9	5,2	4,8	13,5	6,7
Electrical equipment and electronics	1,8	0,1	3,5	5,9	4,3	5,4	0,6	3,7	5,5	15,1	7,7
Information technology, automated office equipment & precision instruments	6,8	7,1	8,2	7,4	16,0	7,9	7,0	8,9	5,7	6,8	7,0
Chemicals and pharmaceuticals	8,3	5,0	5,1	4,9	7,7	6,9	3,9	5,5	3,7	11,8	6,4
<i>Moderate-demand sectors</i>	2,5	1,6	1,4	2,3	2,8	4,4	0,3	1,9	2,3	4,8	2,5
Rubber and plastics	8,0	0,0	4,1	3,5	1,6	6,9	0,8	3,2	5,0	1,2	3,5
Transport equipment	2,8	-1,2	3,2	4,7	5,8	0,6	-0,3	3,2	1,4	7,1	2,9
Paper pulp, packaging & printing	1,1	1,1	1,1	2,6	2,6	3,9	0,7	1,8	2,9	3,7	2,6
Food, drink and tobacco	2,2	3,1	1,1	1,5	4,0	5,8	1,2	2,0	1,7	3,8	2,2
Industrial machinery	2,2	0,2	0,2	0,2	-1,0	4,0	-1,0	0,2	3,2	3,6	2,0
<i>Weak-demand sectors</i>	1,4	-0,1	-0,1	-0,1	2,6	1,4	-2,1	0,2	0,5	3,0	1,1
Misc. products	2,5	-1,0	-1,1	3,3	4,7	3,7	-1,6	1,3	1,8	1,4	1,5
Textiles, leather and clothing	0,8	1,1	-0,5	-0,9	2,7	-0,4	-0,3	0,2	1,5	2,7	1,2
Steel and metal ores	1,6	8,3	0,6	-0,7	3,5	-0,2	-0,7	0,7	-0,7	3,7	1,3
Metal goods	1,8	0,6	0,3	-0,9	-0,2	2,2	-3,9	-0,5	-0,0	4,2	1,2
Construction materials, non-metallic minerals	1,5	-3,0	0,4	2,2	3,7	2,3	-3,2	0,9	0,3	1,8	1,0
<i>Total manufactured products</i>	2,9	1,4	1,6	2,3	3,5	3,8	-0,2	1,9	2,3	6,4	3,1

¹ The average annual growth rate is calculated on the basis of data smoothed over two years: average for 1981-82 compared with average for 1972-73.

Sources: Eurostat and Commission departments.

As mentioned above, the sectoral classification of the individual countries diverges quite significantly from that of the entire area under review. Thus transport equipment should, if anything, be classified with the strong-demand sectors in Japan and in most European countries, while industrial machinery should, if anything, feature among the weak-demand sectors in the Community (with the exception of the Netherlands). Nevertheless, the growth rate of demand in each sector should also be compared with that of industry as a whole, and in many cases the classification made is justified on this basis. Thus, the growth of domestic demand for food or industrial machinery has been considerable in Japan (averaging 3,8 % and 3,6 % a year respectively) but, compared with the growth rate of demand for industrialized products in Japan (averaging 6,4 % a year), these figures are still quite modest.

Overall however, the classification of sectors based on data for the zone as a whole, is close to that obtained for each country separately, including those of medium size.

1.2 The shifting pattern of demand in industrialized countries

Table 1 gives average changes in domestic sectoral demand in volume terms in the period 1972-82, after adjusting for the impact of cyclical fluctuations. In some cases, demand is insensitive to general economic conditions while, in others, the latter are the determining influence on demand.

Strong-demand sectors

The sectors falling into this category are still by far those least affected by the fluctuations discernible in the industrialized economies (see Graph 1). Most remarkable is the 'information technology, automated office equipment and precision instruments' sector, where the trend has remained practically unchanged since the early 1970s. It is interesting to note that information-technology requirements have grown more rapidly in Europe than in the United States or Japan. In terms of annual averages, domestic demand in the Community is reckoned to have risen by 8,9 % as against 5,7 % in the United States and 6,8 % in Japan, with closely comparable figures being recorded in the different Member States (without exception, their performances have surpassed that of Japan). European firms in this sector have therefore invested heavily in new plant and machinery, the problem being to know whether supply has managed to keep pace with the sharp increase in demand. This sector has thus been unaffected by the crisis and represents a growing share of total domestic demand. Electrical engineering (electrical

equipment, heavy electrical plant) and electronics (consumer electronics, telecommunications equipment) present a somewhat different picture. Although the trend in this sector too has been virtually unaffected by general economic conditions, considerable differences do exist between the leading industrialized countries. Growth in Europe (3,7 % a year) thus lags a long way behind that in Japan (averaging 15,1 % a year).¹ Furthermore, a closer analysis of the trends in world demand shows clearly that demand for electronic components and consumer electronics is continuing to expand while heavy electrical plant and electrical supplies and cables are experiencing some contraction in demand, which is being reflected in the characteristic demand curve for the entire 'electrical equipment and electronics' sector.

In the chemical sector, a similar differentiation phenomenon is evident. While pharmaceuticals have been spared by the crisis, the petrochemical industry as a whole has suffered the backlash of higher oil prices. Growth in these sectors has not therefore followed a particularly steady path and, even if the long-term trend is sharply upwards, the demand for certain product categories can be more erratic. Buoyant growth on the chemicals market in the Community (5,5 % a year on average) and in Japan (11,8 %) contrasts with the modest growth in the United States (3,7 %).

The feature common to this group of products, for which there is very strong demand, is their pronounced new-technology content, as can be clearly seen from a comparison of the list of strong-demand sectors with the OECD classification of industries with a high-technology content.²

OECD classification of high-technology industries

on the basis of the level of R&D spending
(SITC nomenclature)

1. Aerospace
2. Information technology and automated office equipment
3. Electronics
4. Pharmaceuticals
5. Precision and measuring instruments
6. Electrical equipment

¹ The growth rate in Japan has probably been somewhat overestimated. Some of the most dynamic activities in this sector should appear in the 'information technology/automated office equipment' sector, where the growth rate has been underestimated in Table 1.

² OECD, *Spécialisation et compétitivité des industries manufacturières en haute, moyenne et faible intensité en R&D*, Paris, October 1984.

Classification of strong-demand sectors¹

on the basis of domestic demand growth between 1972 and 1982 (NACE nomenclature)

1. Electrical equipment and electronics
2. Information technology, automated office machinery, and precision and measuring equipment
3. Chemicals and pharmaceuticals

As pointed out in the OECD report, this group of industries on its own accounts for over 50 % of R&D spending by industry whereas it represents about one quarter of value-added in industry in the Community, compared with around one third in the United States and Japan. There is very vigorous growth in the demand for the products manufactured by these industries, which have other features in common too: large amount of R&D expenditure, very high investment risks, immense strategic importance at national level, a more rapid introduction of new products, and fierce competition in the areas of production and marketing worldwide.

Moderate-demand sectors

This grouping comprises sectors that differ a great deal both in terms of their role in the productive system and as regards type of customer.

A more detailed disaggregation would be needed for the 'transport equipment' sector. Shipbuilding, for example, has been severely hit by the crisis while aerospace emerged in much better shape. Lastly, there is the motor vehicle industry, which, directly and indirectly, plays a major role in European industry and which, in the industrialized countries, has seen its growth rate fall below that recorded in the period 1960-73. The demand for motor vehicles is slackening and is now often confined to replacement purchases, particularly in the United States. The Japanese domestic market is the only one which continues to be sustained by some degree of buoyancy, and as a result it enjoys a not-inconsiderable competitive edge on export markets.

Growth in the agri-food, drink and tobacco industries, which are directly dependent on private consumption and exports, has been modest (2,0 % a year) but has followed a very steady trend over time, having been hardly affected at all by the crisis. Domestic demand in two European countries,

Italy and the Netherlands, has been firmer (4 % and 5,8 % respectively), reflecting the importance of these industries in their productive systems.

The industrial machinery sector covers activities ranging from machine tools to textile machinery, agricultural machinery, civil engineering equipment, handling equipment and miscellaneous items of mechanical equipment. It thus produces plant and machinery for the productive system, and the demand for such equipment is heavily dependent on the trend of gross fixed capital formation in industry. The scale of the investment problem facing European countries is clearly illustrated by the differences in the growth rate of demand in volume terms between Europe (0,2 %), the United States (3,2 %) and Japan (3,6 %).

Weak-demand sectors

Demand in the textile, leather and clothing industries contracted in volume terms between 1972 and 1982 in four of the nine countries for which sectoral statistics are available. This sector is characterized by a very sluggish trend rate of growth and by a quite marked sensitivity to economic recessions. Even in Japan and Italy, where the demand for textiles has remained more pronounced than elsewhere (rising by 2,7 % a year compared with 2,1 % in the area surveyed), a downturn in economic activity occurred after 1979, bringing a significant fall in the growth rate.

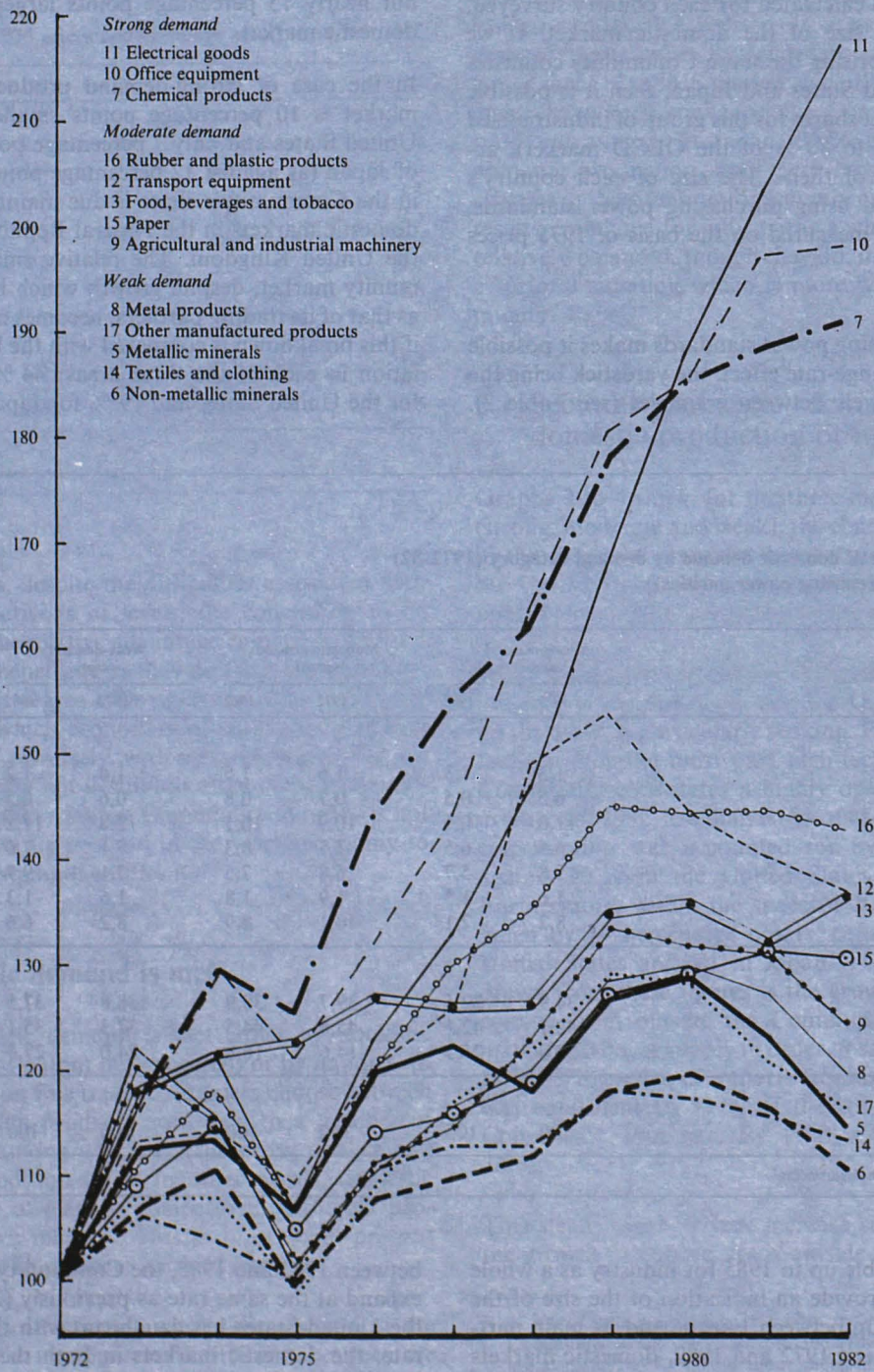
In many respects, the situation in the steel and metal goods sectors is quite similar to that in the textile industry, although both sectors experienced more pronounced fluctuations in activity and displayed greater sensitivity to economic crises. The markets downstream (motor vehicles, building and construction) are now, for the most part, 'replacement' markets, indicating that, here too, the growth prospects for demand in the medium term should show little, if any, change from the trends observed over the last 10 years. In the steel industry proper, Japan and Italy still stand out from the rest, domestic demand in both countries growing three times as fast as in their main trading partners.

The building materials and non-metallic minerals sector is largely dependent on developments in construction and public works. This explains why demand has remained flat over the period under review. Here too, Italy stands out in part from the rest because of its less favourable position at the outset.

The miscellaneous products sector covers a range of industrial activities that are apparently unrelated (sporting arms, jewellery, musical instruments) and its importance in industry is altogether marginal. The comparisons therefore are not very significant.

¹ Aerospace equipment should be included in this classification but could not be distinguished statistically from 'transport equipment' which is included in the moderate-demand sectors.

GRAPH 1: Trend of demand in volume terms in the industrialized countries (1972-82) (1972 = 100)



1.3 National domestic markets: size and development

Domestic demand, as calculated for each country surveyed, is a measure of the size of the domestic market. If we look at the area comprising the seven Community countries concerned, the United States and Japan, then it is possible to calculate the market shares for this group of industrialized countries (equivalent to 80 % of the OECD market), accounted for by each of them. The size of each country's market was estimated using purchasing power standards, while its growth was measured on the basis of 1975 prices and exchange rates.

Using current purchasing power standards makes it possible to eliminate the exchange-rate effect, the yardstick being the difference in price levels between countries (see Table 2).

The main lesson to be learnt from the figures in the table is the small (and diminishing) size of the European internal market. In 1982, taking industry as a whole, it was smaller than that of the United States (37 % as against 40,7 %), but nearly 15 percentage points larger than the Japanese domestic market.

In the case of strong-demand products, the Community market is 10 percentage points smaller than that of the United States and only 7 percentage points larger than that of Japan (as against 12 percentage points in 1972). The fall in the Community's share is due mainly to the contracting domestic markets in the Federal Republic of Germany and the United Kingdom. The relative smallness of the Community market, despite growth which has been as buoyant as that of its trading partners, becomes even more significant if this breakdown is compared with the breakdown of population in each of the three areas: 44 % for Europe, 37 % for the United States and 19 % for Japan.

Table 2

Geographical breakdown of domestic demand by demand category (1972-82)
(at current prices and purchasing power parities)

	(%)							
	Strong-demand sectors		Moderate-demand sectors		Weak-demand sectors		Total industry	
	1972	1982	1972	1982	1972	1982	1972	1982
B	1,3	1,3	1,6	1,5	1,4	1,2	1,5	1,4
DK	0,5	0,5	0,7	0,8	0,6	0,5	0,6	0,6
D	11,0	10,1	10,9	10,1	12,8	11,2	11,6	10,5
F	6,5	6,5	7,7	8,3	7,1	7,0	7,2	7,5
I	5,8	5,7	6,8	7,5	7,1	9,7	6,8	7,9
NL	1,6	1,3	1,9	1,8	1,6	1,3	1,7	1,5
UK	8,2	7,1	10,1	8,9	8,2	6,6	9,1	7,7
EUR 7	34,9	32,5	39,7	38,9	38,8	37,5	38,6	37,0
USA	42,1	42,1	45,6	44,5	37,3	35,1	41,9	40,7
Japan	23,0	25,5	14,6	16,8	24,0	27,5	19,6	22,3
EUR 7+ USA + Japan	100	100	100	100	100	100	100	100

Sources: Eurostat and Commission departments.

Trend data are available up to 1985 for industry as a whole (see Table 3). They provide an indication of the size of the gap that has opened up between Europe and its main partners since 1982. Between 1972 and 1982, domestic markets for industrial products in the Community and the United States were expanding at the same rate. Since then, i.e.

between 1982 and 1985, the Community has seen its market expand at the same rate as previously (2,4 % a year), while the United States has caught up with the Japanese growth rate, the domestic markets in both these countries having expanded on average by 6,5 % a year in the last three years.

Table 3

Movements in domestic demand in volume terms for all industrial products (1972-85)
(annual growth rate, as %)
(in US dollars and at 1975 prices and exchange rates)

	1982/72	1983	1984	1985 ¹	1985/82
B	2,9	-0,6	2,9	1,3	1,2
DK	1,4	5,6	8,8	6,5	7,0
D	1,6	3,1	3,4	2,7	3,1
F	2,2	-1,2	1,0	1,2	0,3
I	3,5	-7,7	4,8	2,1	-0,4
NL	3,8	0,3	5,8	3,2	3,1
UK	0,3	5,5	4,7	4,1	4,8
EUR 7	2,0	0,9	3,4	2,9	2,4
USA	2,3	6,7	9,9	3,5	6,7
Japan	6,4	3,6	10,2	5,8	6,5

¹ Estimate.

Sources: Eurostat and Commission departments.

In the final analysis, despite the difficulties associated with international comparisons of levels, the conclusion to be drawn is obvious: the relative advantage enjoyed by US and Japanese industry, benefiting as they do from vast domestic markets with a high degree of integration in the high-technology sectors, in which economies of scale play a crucial role, is enormous. Conversely, with a market which has not only contracted in size but is still too often compartmentalized as between Member States, Community industry is not best placed to regain its position in the world economy to which its potential strength entitles it.

2. How domestic demand is met

A country's domestic demand is met either by domestic production (share of output not exported) or by imports. In an economy based on free trade, consumers choose between domestic and foreign products according to a number of criteria, principal among which are the price, quality and novelty of the goods on offer. In other words, domestic producers must be at least as competitive as foreign producers on their own markets. This is an essential precondition of being able to compete on third markets.

Taking industrial products as a whole, there would at the moment appear to be no appreciable difference between the United States and the Community (when considering only extra Community trade) in the way in which consumers

choose between products according to their country of origin. Domestic production has in recent years gone towards meeting just less than 90 % of Community demand and a little more than 90 % of demand in the US.¹ with imports accounting for the remainder. Given the rise of the dollar, foreign products (expressed as a percentage of domestic demand) have naturally tended to account for a slightly larger share of the US market since 1982; however, developments have been similar in the Community (see Table 2, statistical annex). In Japan, 95 % of demand is met by domestic production, and there have been no significant changes in the situation for a number of years. These overall results, estimated for industry as a whole, thus appear to be relatively balanced, though they do, in point of fact, conceal a sectoral situation which is more worrying for the Community.

2.1 Sectoral domestic demand met out of domestic production or imports

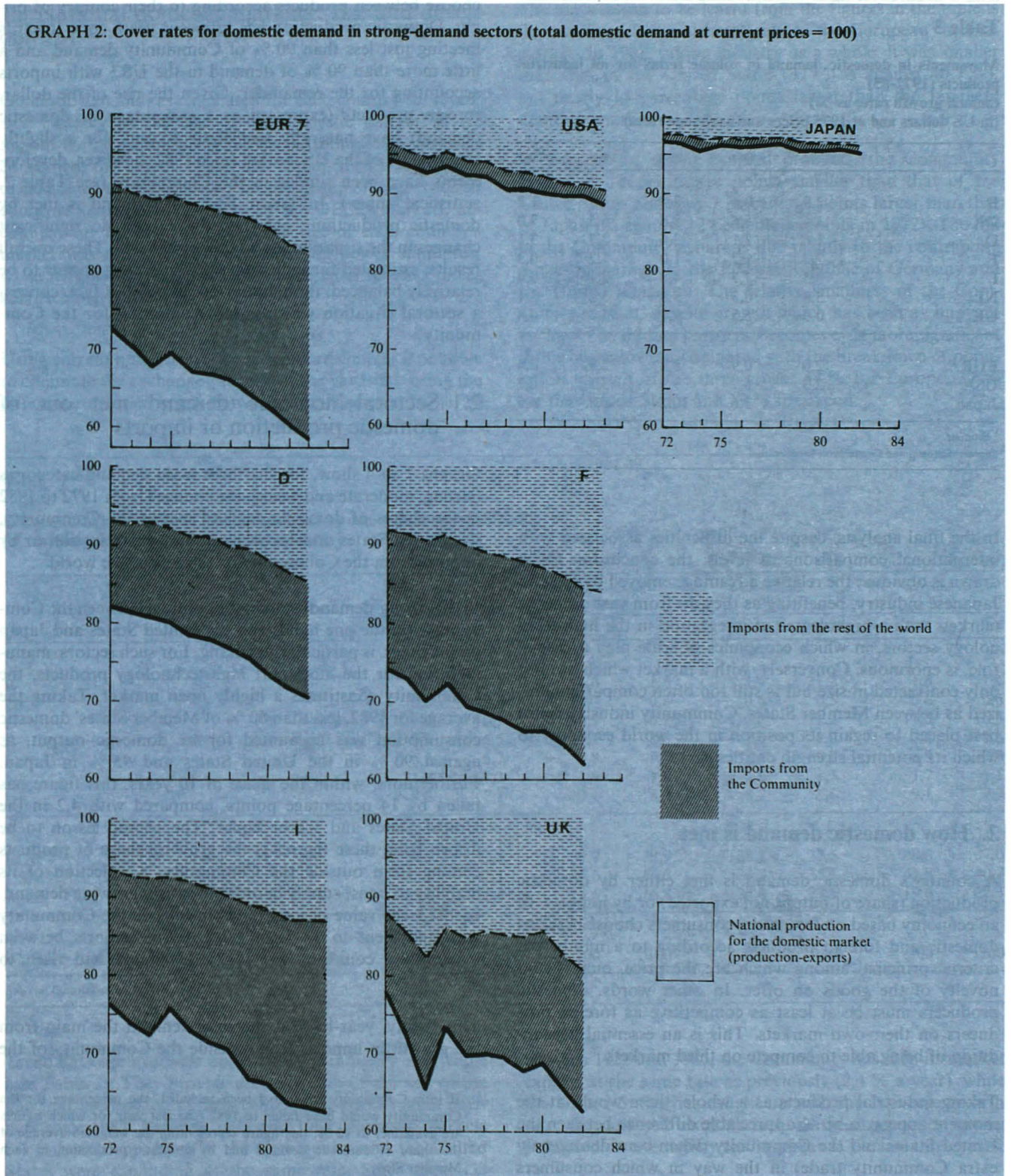
Graphs 2 to 4 show, for the three main demand categories (strong, moderate and weak), the changes from 1972 to 1982 in the shares of domestic demand met in the Community, the United States and Japan by domestic production or by imports from the Community or the rest of the world.

In the strong-demand sectors, the contrast between the Community, on the one hand, and the United States and Japan on the other, is particularly striking. For such sectors, manufacturing for the most part high-technology products, the Community constitutes a highly open market. Taking the average for 1982, less than 60 % of Member States' domestic consumption was accounted for by domestic output, as against 90 % in the United States and 95 % in Japan. Furthermore, within the space of 10 years, this figure has fallen by 14 percentage points, compared with 4,2 in the United States and 1,1 in Japan. The second lesson to be drawn from these figures is the growing share of products coming from outside the Community, a reflection of its inability to boost supply in order to satisfy growing demand. In 1972, the value of imports from outside the Community was equivalent to 53 % of the total of imports between Community countries. By 1982, this figure had risen to 72 %.

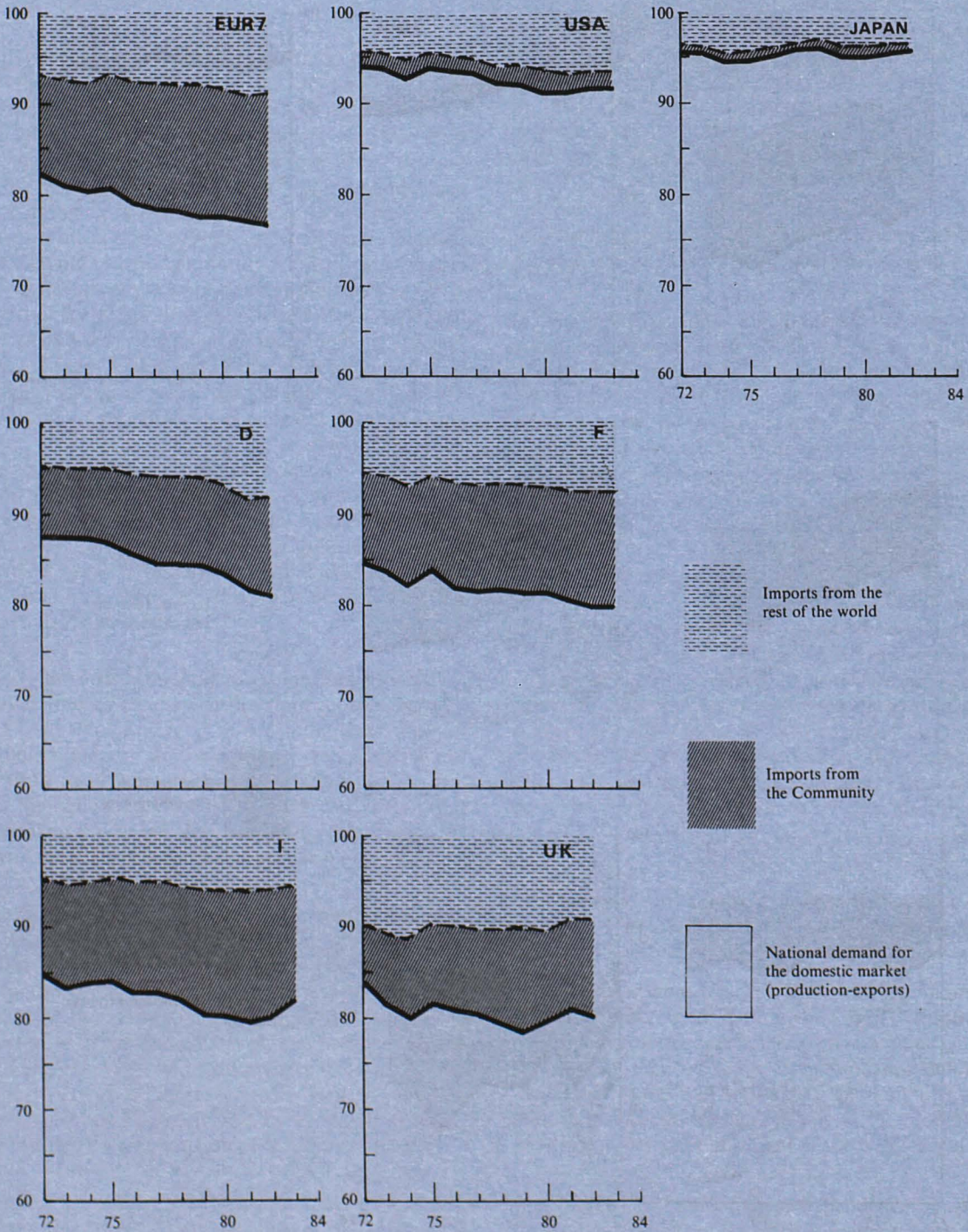
This steady, year-by-year increase stems in the main from the growth in imports from outside the Community of the

¹ If intra-Community trade had been included, the percentage for the Community would have fallen in 1982 (the last year for which figures are available) to 72 %, this figure representing the weighted average of the share of domestic demand met by domestic production in each Member State.

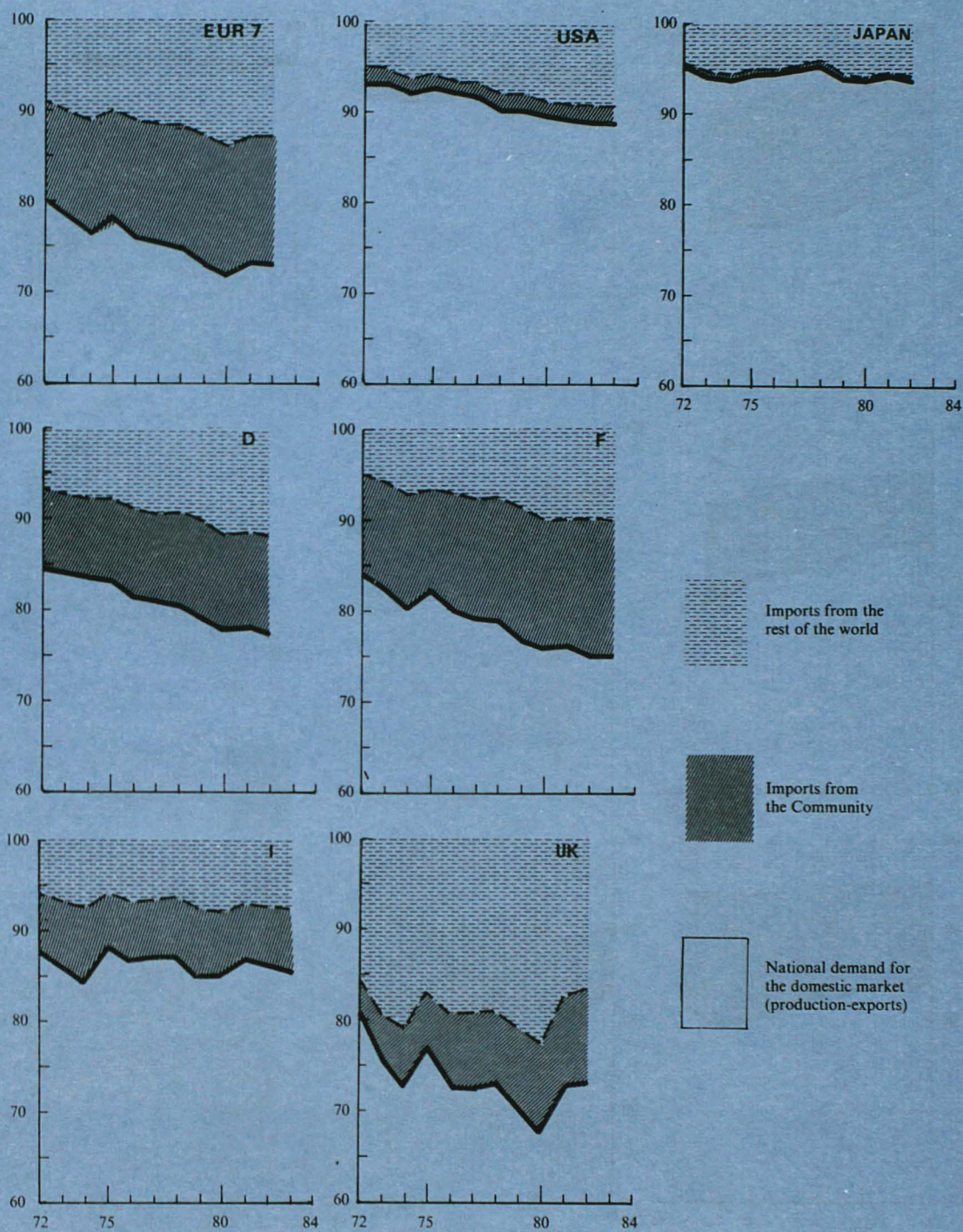
GRAPH 2: Cover rates for domestic demand in strong-demand sectors (total domestic demand at current prices = 100)



GRAPH 3: Cover rates for domestic demand in moderate-demand sectors (total domestic demand at current prices = 100)



GRAPH 4: Cover rates for domestic demand in weak-demand sectors (total domestic demand at current prices = 100)



whole range of products with electronic components (ranging from information technology and automated office equipment to measuring and precision instruments). In the chemical and pharmaceutical sector, the expansion of trade is due more to intra-Community trade.

Penetration by products from outside the Community is much less significantly marked in the moderate-demand sectors. Community integration has made further, albeit less rapid, advances here too, especially in the transport equipment and industrial machinery sectors. Since the end of the 1970s, however, the penetration rates for industrial machinery coming from outside the Community have risen very sharply. In the period 1979-82, such machinery boosted its share of demand in the Community from 12 % to almost 17 %. This rapid growth in imports from outside the Community of products going through a period of technological upheaval is particularly marked in France, the United Kingdom, and to a lesser extent, the Federal Republic of Germany. It is a disturbing reflection on the technologically outdated nature of Community products and of the growing tendency for them to be replaced by products frequently of Japanese origin. The example of France is particularly revealing in this respect: traditionally an importer of machine tools, it saw the proportion of its domestic demand accounted for by Community imports of industrial machinery fall from 32 % to 30 % between 1979 and 1983. During that same period, the rate of penetration by non-Community products increased from 14 % to 19 %.

Leaving aside the special case of plant and machinery, the Community countries have generally been more successful in terms of both trend and level, in retaining their share of the Community market in this product category (shares exceeding 80 % in the case of the larger countries). As will be seen in the following chapter, it is in this sector that Community firms have managed their best performances as regards investment, profitability and labour costs.

Finally, the weak-demand sectors in the Community remain relatively dependent on foreign products although there are no major differences between imports from within the Community and those from outside. The penetration rates for Community and non-Community products have both risen by just under four percentage points. In these sectors however, there are very wide differences between Community countries (with an increase in the share of domestic demand in the United Kingdom met by Community firms, and a very low level of penetration of the Italian market)

As is common knowledge, the Japanese market is quite different from the others; firstly, because of its low level of imports (on average 5 % of domestic demand is covered by

imports), and, secondly, because of the remarkable stability that has characterized the level of imports (no real change in 10 years). Moreover, the estimates available for the period up to 1985 show no noticeable change in the situation. The 5 % figure is not significantly exceeded in any sector except the 'metal ores' sector (importation of raw materials), and the share of Japanese domestic demand met by Community products is very low indeed (0,8 % for industry as a whole). In 1982, the highest share accounted for by Community products was 1,8 % on the Japanese domestic market in industrial machinery, although even this figure was lower than that recorded in 1974/75 (2,3 %). While percentages of a similar order of magnitude can be observed in the textile and clothing industries and in the chemical industry, no increase is discernible in any of them.

In the early 1970s, the United States was in a similar situation to Japan, with the level of import penetration running at around 5 %, but the trend in the United States has been very different. The US market has gradually opened itself up to imports. In the strong-demand sectors, imports now cover a little over 10 % of domestic demand for industrial products. The opening up of the US domestic market has accelerated with the rise of the dollar and, between 1982 and 1985, the level of import penetration continued to rise appreciably (by 1,7 % in three years). However, this has brought little or no benefit for imports from Europe, and the share of European imports on the US market has remained virtually unchanged for the last 10 years (between 1,6 and 2 % of total domestic demand). Community exports to the US market have expanded at much the same rate as US domestic demand. The very strong surge in European exports to the US market in 1984 has not brought about any fundamental change in the situation. It is thus mainly non-European, and in particular Japanese, exports which have been satisfying a growing share of US domestic demand.

2.2 Origin of Community imports differs according to the products concerned

The countries from which the European Community imports goods are, of course, mainly the OECD countries, but the patterns of import dependence differ a great deal from one sector to another (see Table 4). In the strong-demand sectors, the United States and Japan play a dominant role, but their importance decreases significantly in the moderate-demand sectors and becomes marginal in the weak-demand sectors.

The pattern of technological dependence characteristic of strong-demand products is very evident here. Taken as a whole, the newly-industrialized countries still play a mar-

ginal role in such sectors, although their share of the weak-demand sectors now exceeds that of the United States. Japan's share in the moderate-demand sectors is accounted for solely by imports of motor vehicles and machine tools. The Eastern Europe countries have a genuine presence only in the weak-demand sectors.

The United States imports its strong-demand products mainly from Japan, the Community (chemicals in particular), South-East Asia and Canada (rest of the OECD), but it is interesting to note that the largest share of the US market accounted for by Community products is in the moderate-demand sectors. Here too, Japanese cars are naturally the key factor in the high percentage of imports of transport equipment which make up nearly 40 % of total US imports, a much higher percentage than in the Community or Japan.

The level of Japanese industrial imports is as we have seen, low compared with the scale of domestic demand. They

also differ in terms of their geographical origin from the industrial imports of their trading partners. In 1983, for example, imports of high-technology (strong-demand) products accounted for only 27 % of total imports. In all, 51 % of such high-technology imports were made up of US products as against only 21 % for Community products. However, Japanese industrial imports consist primarily of weak-demand products (46 % of total imports) from countries in South-East Asia but also from the United States and the countries of Latin America.

2.3 The increase in the Community's import dependence is to be found mainly in strong-demand products

A look at the relative trend of the levels of sectoral import penetration in relation to the trend for industrial products as a whole indicates the lessons to be drawn from this initial analysis (see Table 5).

Table 4

Structure and geographical breakdown of industrial imports in 1983

	EUR 10 ¹					USA					Japan			
	Imports					Imports					Imports			
	SD	MD	WD	Total industry		SD	MD	WD	Total industry		SD	MD	WD	Total industry
<i>OECD</i>	24,3	24,8	19,6	68,6	<i>OECD</i>	17,4	35,8	15,8	69,1	<i>OECD</i>	21,3	22,4	20,3	64,0
USA	10,7	7,3	3,3	21,2	Japan	8,6	10,8	3,2	22,6	USA	13,5	11,5	6,0	31,0
Japan	5,6	4,0	1,1	10,7	EUR 10	4,8	9,0	5,8	19,6	EUR 10	5,5	5,5	4,2	15,2
Rest of OECD	8,0	13,5	15,3	36,7	Rest of OECD	4,0	16,0	6,8	26,9	Rest of OECD	2,3	5,4	10,1	17,8
<i>Developing countries</i>	4,0	6,6	13,4	24,0	<i>Developing countries</i>	7,7	4,0	11,6	23,3	<i>Developing countries</i>	3,9	3,4	20,5	27,8
South-East Asia	1,6	0,9	3,3	5,8	South-East Asia	4,6	1,1	5,2	10,9	South-East Asia	2,3	1,2	6,6	10,0
Africa	0,1	0,8	2,3	3,2	Africa	0,1	0,1	1,2	1,4	Africa	0,1	0,3	2,8	3,1
Total East Eur.	0,9	1,1	2,7	4,7	Total East Eur.	0,1	0,2	0,2	0,6	Total East Eur.	0,2	0,2	1,1	1,5
Total OPEC	0,2	0,6	0,7	1,5	Total OPEC	0,2	0,1	0,4	0,6	Total OPEC	0,1	0,1	2,6	2,8
Latin America	0,5	2,6	2,3	5,3	Latin America	2,5	2,4	3,4	8,2	Latin America	0,6	1,0	5,3	7,0
Other LDCs	0,7	0,6	2,1	3,5	Other LDCs	0,2	0,1	1,2	1,6	Other LDCs	0,6	0,6	2,1	3,4
<i>Rest of world</i>	1,5	2,7	3,1	7,4	<i>Rest of world</i>	1,9	1,2	4,6	7,6	<i>Rest of world</i>	1,0	2,1	5,1	8,2
<i>Total</i>	29,8	34,1	36,1	100	<i>Total</i>	27,0	41,0	32,0	100	<i>Total</i>	26,2	27,9	45,9	100

¹ Extra-Community trade for the Community of Ten.
NB: SD = strong demand; MD = moderate demand; WD = weak demand.
Source: Volimex, DG II.

Table 5

Import specialization in 1983 and change compared with 1972
(in current US dollars)

EUR 10 ¹	Level 1983	Change ² 1983-72	USA	Level 1983	Change ² 1983-72	Japan	Level 1983	Change ² 1983-72
1. Paper, packaging	MD 1,49	-0,13	1. Transport equip- ment	MD 1,41	-0,13	1. Steel and metal ores	WD 2,51	+0,33
2. Miscellaneous in- dustrial products	WD 1,38	-0,30	2. Electrical equip- ment and elec- tronics	SD 1,32	+0,19	2. Food products	MD 1,48	+0,10
3. Information tech., precision & office equipment	SD 1,34	+0,23	3. Miscellaneous in- dustrial products	WD 1,22	-0,08	3. Chemicals	SD 1,19	+0,21
4. Steel and metal ores	WD 1,12	-0,13	4. Textiles, leather and clothing	WD 1,04	+0,01	4. Miscellaneous in- dustrial products	WD 1,12	-0,30
5. Electrical equip- ment and elec- tronics	SD 1,10	+0,24	5. Information tech., precision & office equipment	SD 0,97	+0,12	5. Non-metallic minerals	WD 1,12	+0,15
6. Textiles, leather and clothing	WD 1,10	+0,16	6. Industrial machinery	MD 0,91	+0,21	6. Textiles, leather and clothing	WD 0,88	+0,12
7. Food products	MD 1,03	-0,42	7. Rubber, plastics	MD 0,91	-0,18	7. Paper, packaging	MD 0,88	+0,22
8. Non-metallic minerals	WD 0,93	+0,05	8. Steel and metal ores	WD 0,90	-0,10	8. Electrical equip- ment and elec- tronics	SD 0,71	+0,14
9. Industrial machinery	MD 0,92	+0,16	9. Metal goods	WD 0,88	+0,04	9. Information tech., precision & office equipment	SD 0,68	-0,44
10. Chemicals	SD 0,83	-0,02	10. Paper, packaging	MD 0,88	-0,20	10. Industrial machinery	MD 0,59	-0,09
11. Metal goods	WD 0,82	+0,17	11. Non-metallic minerals	WD 0,78	-0,16	11. Metal goods	WD 0,46	+0,19
12. Rubber, plastics	MD 0,68	+0,08	12. Food products	MD 0,66	-0,22	12. Rubber, plastics	MD 0,42	+0,19
13. Transport equip- ment	MD 0,61	+0,20	13. Chemicals	SD 0,57	+0,11	13. Transport equip- ment	MD 0,35	-0,01
Strong demand (SD)	1,01	+0,13	Strong demand (SD)	0,93	+0,13	Strong demand (SD)	0,88	+0,08
Moderate demand (MD)	0,88	-0,04	Moderate demand (MD)	1,05	-0,06	Moderate demand (MD)	0,73	+0,01
Weak demand (WD)	1,13	-0,04	Weak demand (WD)	1,00	-0,04	Weak demand (WD)	1,44	+0,03

¹ Extra-Community trade for the Community of Ten.

² Change: difference in import specialization between 1983 and 1972.

NB: Import specialization: $\frac{\text{Imports in a sector in one country}}{\text{total imports of that country}} / \frac{\text{total imports of that sector for the OECD area}}{\text{total OECD imports}}$

Source: Volimex, DG II.

The Community countries are showing an increasing propensity to import strong-demand and high-technology products (information technology equipment, automated office equipment, precision equipment, electrical equipment and electronics). In these sectors the import specialization coefficient¹ rose significantly over the period (+ 0,23 and + 0,24). By contrast, though it has traditionally been an importer of paper, metal ores and agri-foodstuffs, the Community has reduced its specialization coefficient for products in these sectors (- 0,13 and - 0,42). There has therefore been an appreciable change over the 10-year period in the Community's import profile, with a very appreciable improvement in certain traditional sectors in which demand is moderate or weak and greater import dependence on high-technology products and, more generally, capital goods (to these can be added, over and above the products already mentioned, industrial machinery and transport equipment). As part two of this chapter also shows, the more pronounced import specialization in such goods, which have high value-added, R&D and skilled-labour contents, is accompanied by a deterioration in the level of export specialization in such goods, resulting in a steady decline in the Community's trade surplus.

The level of import specialization in the United States differs relatively little from that of the Community, the specialization indices for capital goods, textiles and clothing being relatively high. However, it is concentrated on a smaller number of sectors (4 out of 13 sectors have a dependence index, measuring import specialization, of more than 1), and the variations in the indices between 1972 and 1983 are generally smaller than in the case of the Community. Here again, it is in the levels of export specialization, with specialization being concentrated on strong-demand products in the case of the United States, that the most marked differences in pattern between the United States and the Community appear.

In Japan, the results are consistent with the developments outlined above, with import specialization concentrated in the main on weak-demand or moderate-demand products (metal ores and non-metallic minerals, textiles and clothing, and foodstuffs). Chemicals are the only strong-demand products to reach a significant level (1,19), up 0,21 since 1972, reflecting Japanese industry's shift away from a sector in which profitability has been affected by the higher costs of energy raw materials. The sharpest fall in import specialization is in information technology and automated office equipment, the index dipping by 0,44 between 1972 and 1983 despite a relatively high level of import penetration relative to domestic demand.

¹ See definition in Table 5.

3. The reaction of exporters

In parallel with the increasing proportion of Community domestic demand met by foreign products, particularly in the case of high-technology, there was a sharp rise throughout the period 1972-82 in the share of Community industrial output being exported. Admittedly this growing concentration on exports has been accompanied by a steady reduction in Member State's shares of markets worldwide. This has meant that Community exports have been growing less rapidly than those of their trading partners. The increase in the proportion of Community output being exported is due primarily to a redirection of trade flows to third-country markets. It is as if, faced with exacting demand in terms of quality and price within the Community, European industrialists have decided to look for new outlets elsewhere. This seems to be borne out by the geographical pattern of their exports and their increased export specialization in weak-demand products. At all events, the trends observed merely confirm the difficulty encountered by Community producers in maintaining their shares of expanding markets in industrialized countries.

3.1 An increasing proportion of Community output is being exported

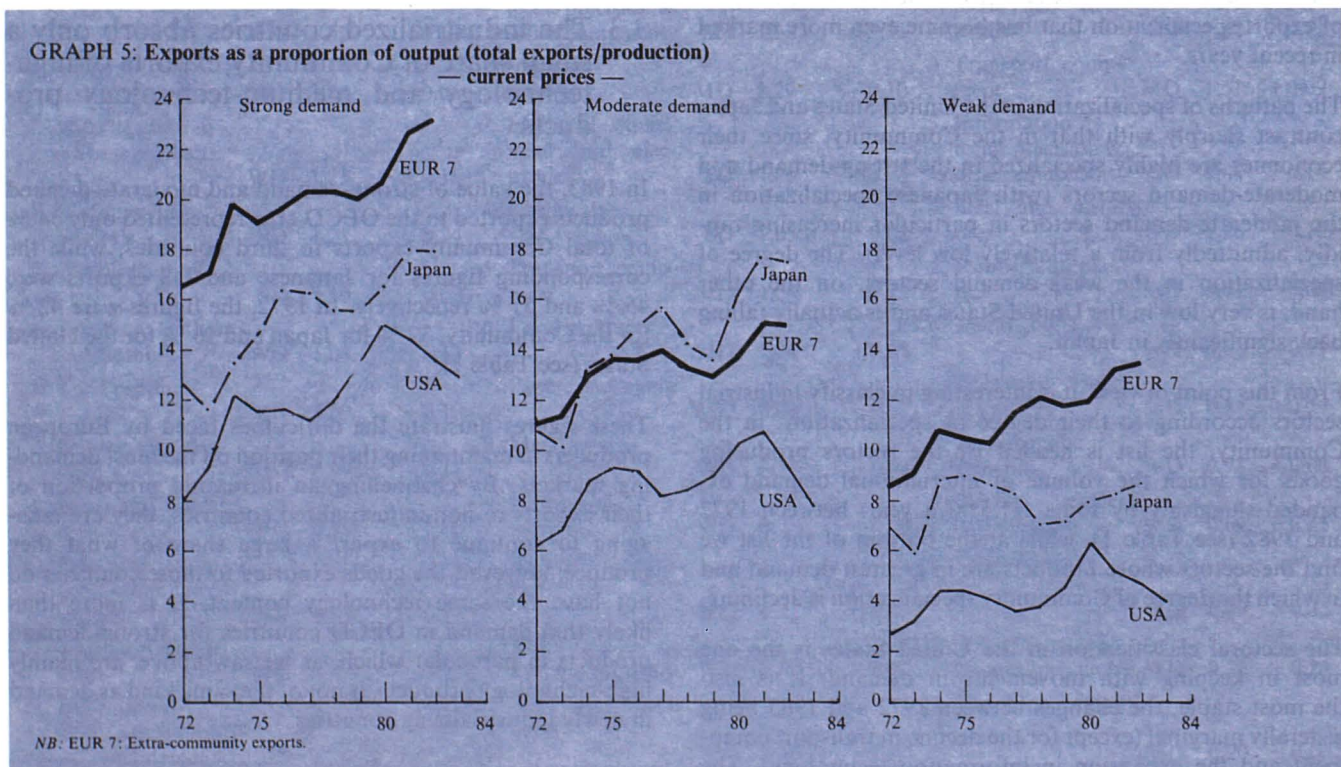
In 1982, manufacturing firms in the Community exported 16 % of their output to the rest of the world, compared with 9 % in the United States and 14 % in Japan. In the strong-demand sectors in particular, the proportion of their output exported was substantial (23 % in 1982) and expanding rapidly (up 6,2 percentage points compared with 1972). It easily exceeds the corresponding percentages in the United States and Japan (see Graph 5). In the other product categories, the proportion of output exported was not as large but, generally speaking, it was higher than in the United States and Japan.

At first sight, therefore, the Community's performance was satisfactory and improved steadily between 1972 and 1982 in all the sectors surveyed. As shown in Graph 5 the rate of growth matches that recorded in Japan for strong-demand products and was actually higher in the case of weak-demand products.

This encouraging export performance is all the more significant as the figures for output exported relate only to trade with countries outside the Community. If exports to other Member States were included, the proportion of Community output exported would be roughly doubled.

The expansion in US exports has been less vigorous. The share of US industrial output exported — a figure that has consistently lagged behind the corresponding figure for the Community or Japan — peaked at over 10 % in 1980 (15 % for strong-demand products); since then, however, the rapid growth of domestic demand and the steady appreciation of the dollar against the currencies of the United States'

competitors have led to a slow but steady contraction of US export growth. According to the estimates available for 1985, the proportion of total manufacturing output exported will be 7,7 %, compared with 17,4 % for the Community. This proportion which, for the Community, remained stable between 1981 and 1983 at around 16 %, has therefore increased markedly between 1983 and 1985.



A more detailed sectoral breakdown shows that in the case of plant and machinery and chemical and pharmaceutical products, the shares of Community output exported are much the same as, and even higher than, the corresponding figures for Japan, while they easily exceed those recorded in the United States. In terms of the changes in export shares, the bias towards exports discernible in Japan is reflected in increases of almost 15 percentage points over 10 years for industrial machinery and for information technology and automated office equipment, and of 12,5 percentage points for transport equipment.

This generally favourable picture for the Community must, however, be qualified. For, it is only in the case of weak-

demand products that the share of output exported has expanded in step with gains in market shares. In the case of high-technology products, for which there is strong demand, and, to some extent, moderate-demand products, the increase in the proportion of output exported has been accompanied by a contraction in market shares. Community exports of strong-demand products have therefore grown less rapidly than those of the Community's partners (contraction in market shares) but more quickly than output in the Member States (increase in the proportion of output exported). And so here there is a situation in which the structure of export outlets is changing rather than one in which activity is actually expanding.

3.2 Unfavourable pattern of export specialization in the Community

The choices of external trade specialization made by industries in the Community are a source of concern (see Table 6). The degree of export specialization¹ in the Community is low in the case of strong-demand and moderate-demand products; what is more, between 1972 and 1983 it showed the most pronounced decline in the former category. By contrast in the weak-demand sectors, there is a high degree of export specialization that has become even more marked in recent years.

The patterns of specialization in the United States and Japan contrast sharply with that in the Community, since their economies are highly specialized in the strong-demand and moderate-demand sectors (with Japanese specialization in the moderate-demand sectors in particular increasing rapidly, admittedly from a relatively low level). The degree of specialization in the weak-demand sectors, on the other hand, is very low in the United States and is actually falling back significantly in Japan.

From this point of view, it is interesting to classify industrial sectors according to their degree of specialization: in the Community, the list is headed by the sectors producing goods for which the volume of international demand expanded sluggishly by some 1-1,5 % a year, between 1972 and 1982 (see Table 1), while at the bottom of the list we find the sectors whose products are in greatest demand and in which the degree of Community specialization is declining.

The sectoral classification in the United States is the one most in keeping with movements in demand. It is also the most stable, the changes between 1972 and 1983 being generally marginal (except for the decline in transport equipment and the expansion in information technology). The degree of US export specialization is thus high for strong-demand products and low for products in least demand. This reinforces the role of the United States in international trade.

In addition to its presence on the market in high-technology products, Japan was still quite highly specialized in steel and metal goods in 1983; unlike the Community, however, its indices of specialization in these sectors are falling. Furthermore, unlike its partners, it has a chemicals industry that accounts for only a small (and declining) share of exports. The increase in energy input prices goes a long way towards explaining Japan's withdrawal from a sector it now considers insufficiently profitable.

¹ That is to say, the ratio of the export market share of a given industrial sector in the Community to the export market share of total Community industry.

The situation portrayed above is consistent with the conclusions reached in the preceding section. Rising rates of penetration in markets for strong-demand products are accompanied by a growing weakness in the Community's productive system, with exports being concentrated in these sectors where demand is flat. The geographical breakdown of Community exports to third countries is one of the factors influencing specialization choices.

3.3 The industrialized countries absorb only a small share of Community exports of high-technology and medium-technology products

In 1983, the value of strong-demand and moderate-demand products exported to the OECD area represented only 34 % of total Community exports to third countries, while the corresponding figures for Japanese and US exports were 45 % and 51 % respectively. In 1972, the figures were 42 % for the Community, 39 % for Japan and 56 % for the United States (see Table 7).

These figures illustrate the difficulties faced by European producers in maintaining their position on the most demanding markets. By channelling an increasing proportion of their exports to non-industrialized countries, they are managing to continue to export a large share of what they produce; however, the goods exported to those countries do not have the same technology content. It is more than likely that demand in OECD countries for strong-demand products in particular which, as we saw above, are mainly high-technology products, is not of the same kind as demand in newly industrializing countries.

Once again, the general impression left by Table 7 is that Community industry is lagging behind its main partners. It is beset by a series of weaknesses. In the Community, weak-demand products account for a greater proportion of exports than in Japan or the United States. The Community exports less to Japan than the United States and less to the United States than Japan. Moreover, its exports to OPEC countries account for a high proportion of its sales abroad, making it very dependent on income movements in the oil-producing countries, where income has remained high because of the strength of the dollar. Its presence in the newly-industrialized countries, especially in South-East Asia and Latin America, the expanding Third World markets, is still overshadowed by that of the United States or Japan. Only in the OECD area excluding the Community, the United States and Japan, in the State-trading countries and in Africa does its performance surpass those of the United States and Japan.

Table 6

Export specialization in 1983 and change compared with 1972
(in current US dollars)

EUR 10 ¹	Level 1983	Variation ² 1983-72	USA	Level 1983	Variation ² 1983-72	Japan	Level 1983	Variation ² 1983-72
1. Metal goods			1. Information tech., precision & office equipment	SD 1,62	+0,13	1. Electrical equip- ment and elec- tronics	SD 1,82	+0,12
2. Industrial machinery	WD 1,32	+0,19	2. Industrial machinery	MD 1,29	-0,10	2. Transport equip- ment	MD 1,51	+0,09
3. Miscellaneous in- dustrial products	MD 1,25	-0,05	3. Electrical equip- ment and elec- tronics	SD 1,20	+0,06	3. Information tech., precision & office equipment	SD 1,44	+0,14
4. Non-metallic minerals	WD 1,23	+0,18	4. Chemicals	SD 1,03	+0,02	4. Steel and metal ores	WD 1,26	-0,12
5. Chemicals	SD 1,21	+0,24	5. Transport equip- ment	MD 1,04	-0,22	5. Rubber and plas- tics	MD 0,91	-0,09
6. Textiles, leather and clothing	SD 1,16	-0,02	6. Food products	MD 1,04	-0,05	6. Metal goods	WD 0,88	-0,19
7. Food products	WD 1,06	+0,13	7. Paper, packaging	MD 0,96	-0,07	7. Industrial machinery	MD 0,87	+0,27
8. Rubber and plas- tics	MD 1,00	+0,10	8. Metal goods	WD 0,78	-0,04	8. Non-metallic minerals	WD 0,73	+0,03
9. Steel and metal ores	MD 0,97	-0,11	9. Non-metallic minerals	WD 0,75	+0,02	9. Textile, leather and clothing	WD 0,69	-0,45
10. Electrical equip- ment and elec- tronics	WD 0,95	+0,10	10. Rubber and plas- tics	MD 0,71	-0,03	10. Chemicals	SD 0,49	-0,25
11. Transport equip- ment	SD 0,89	-0,08	11. Miscellaneous in- dustrial products	WD 0,67	-0,02	11. Miscellaneous in- dustrial products	WD 0,36	-0,23
12. Information tech., precision & office equipment	MD 0,84	-0,08	12. Steel and metal ores	WD 0,44	-0,02	12. Paper, packaging	MD 0,20	-0,03
13. Paper, packaging	SD 0,64	-0,19	13. Textiles, leather and clothing	WD 0,38	+0,02	13. Food products	MD 0,12	-0,12
	MD 0,50	+0,04						
Strong demand (SD)	0,96	-0,11	Strong demand (SD)	1,18	+0,06	Strong demand (SD)	1,16	-0,01
Moderate demand (MD)	0,97	-0,03	Moderate demand (MD)	1,12	-0,10	Moderate demand (MD)	0,96	+0,23
Weak demand (WD)	1,11	+0,17	Weak demand (WD)	0,55	-0,04	Weak demand (WD)	0,84	-0,38

¹ Extra-Community trade for the Community of Ten.² Change: difference in export specialization between 1972 and 1983.NB: Export specialization: $\frac{\text{exports in a sector in one country}}{\text{total exports of that country}} / \frac{\text{total exports of that sector for the OECD area}}{\text{total OECD exports}}$

Source: Volimex, DG II.

Table 7

Geographical breakdown of industrial exports in 1983
(in US dollars)

	EUR 10 ¹					USA					Japan			
	Exports					Exports					Exports			
	SD	MD	WD	Total industry		SD	MD	WD	Total industry		SD	MD	WD	Total industry
<i>OECD</i>	14,5	19,8	14,3	48,5	<i>OECD</i>	22,9	28,1	8,2	59,2	<i>OECD</i>	21,6	23,1	6,8	51,4
USA	3,6	6,9	4,4	14,9	Japan	3,5	3,2	1,6	8,3	USA	11,5	13,8	4,2	29,5
Japan	0,9	0,9	0,7	2,4	EUR 10	10,9	8,9	2,7	22,5	EUR 10	6,6	4,8	1,2	12,6
Rest of OECD	10,0	12,0	9,2	31,2	Rest of OECD	8,5	16,0	3,9	28,4	Rest of OECD	3,5	4,5	1,4	9,3
<i>Developing countries</i>	12,5	20,1	10,8	43,4	<i>Developing countries</i>	13,2	15,8	4,3	33,2	<i>Developing countries</i>	12,5	16,6	11,5	40,6
South-East Asia	1,2	1,4	0,9	3,5	South-East Asia	4,2	2,7	0,9	7,8	South-East Asia	5,7	4,1	3,8	13,7
Africa	1,5	2,7	0,9	5,1	Africa	0,6	1,1	0,2	1,8	Africa	0,5	1,4	0,3	2,1
Total East Eur.	1,7	2,6	2,0	6,3	Total East Eur.	0,3	0,4	0,1	0,7	Total East Eur.	0,5	0,8	1,0	2,4
Total OPEC	4,7	8,5	4,5	17,8	Total OPEC	2,4	5,1	1,2	8,7	Total OPEC	3,4	6,5	4,0	13,8
Latin America	1,6	2,2	0,8	4,6	Latin America	5,1	5,6	1,9	12,6	Latin America	1,0	2,5	0,5	4,0
Other	1,8	2,7	1,7	6,1	Other	0,6	0,9	0,0	1,6	Other	1,4	1,3	1,9	4,6
<i>Rest of world</i>	3,1	3,2	1,7	8,1	<i>Rest of world</i>	1,8	5,0	0,7	7,6	<i>Rest of world</i>	2,8	3,0	2,1	8,0
<i>Total</i>	30,1	43,1	26,8	100	<i>Total</i>	37,9	48,9	13,2	100	<i>Total</i>	36,9	42,7	20,4	100

¹ Extra-Community trade for the Community of Ten.
 NB SD = strong demand; MD = moderate demand; WD = weak demand.
 Source: Volimex, DG II.

By specializing in products that are in least demand and by channelling a large share of its exports to the least profitable markets, the Community is losing market shares to the United States and Japan in sectors with a high value-added content; it is increasing its market penetration only in sectors where it is least exposed to competition from its main trading partners. Even if the gains and losses cancel each other out overall, this development is bound to jeopardize the chances of a European economic recovery (see Graph 6).

3.4 The Community's cover rate for industrial trade is still high, but high-technology sectors are contributing less and less to trade surpluses

As a result of the pattern of the Community's export specialization and of the increase in penetration rates, the cover rate for strong-demand products has been declining steadily

since 1974, (see Graph 7) largely on account of the poor performances recorded by the Federal Republic of Germany and the United Kingdom (although their cover rates are far from comparable), while the trade surpluses of the other Member States have remained fairly stable.

Better results are recorded in the moderate-demand sectors, but here too, the general outlook is one of slow but steady deterioration in the situation. The Community has the most stable cover rate in the weak-demand sectors, in which several Member States tend to specialize. For example, the pronounced improvement in the Italian cover rate for trade in these products has more than offset the decline in the Belgian rate.

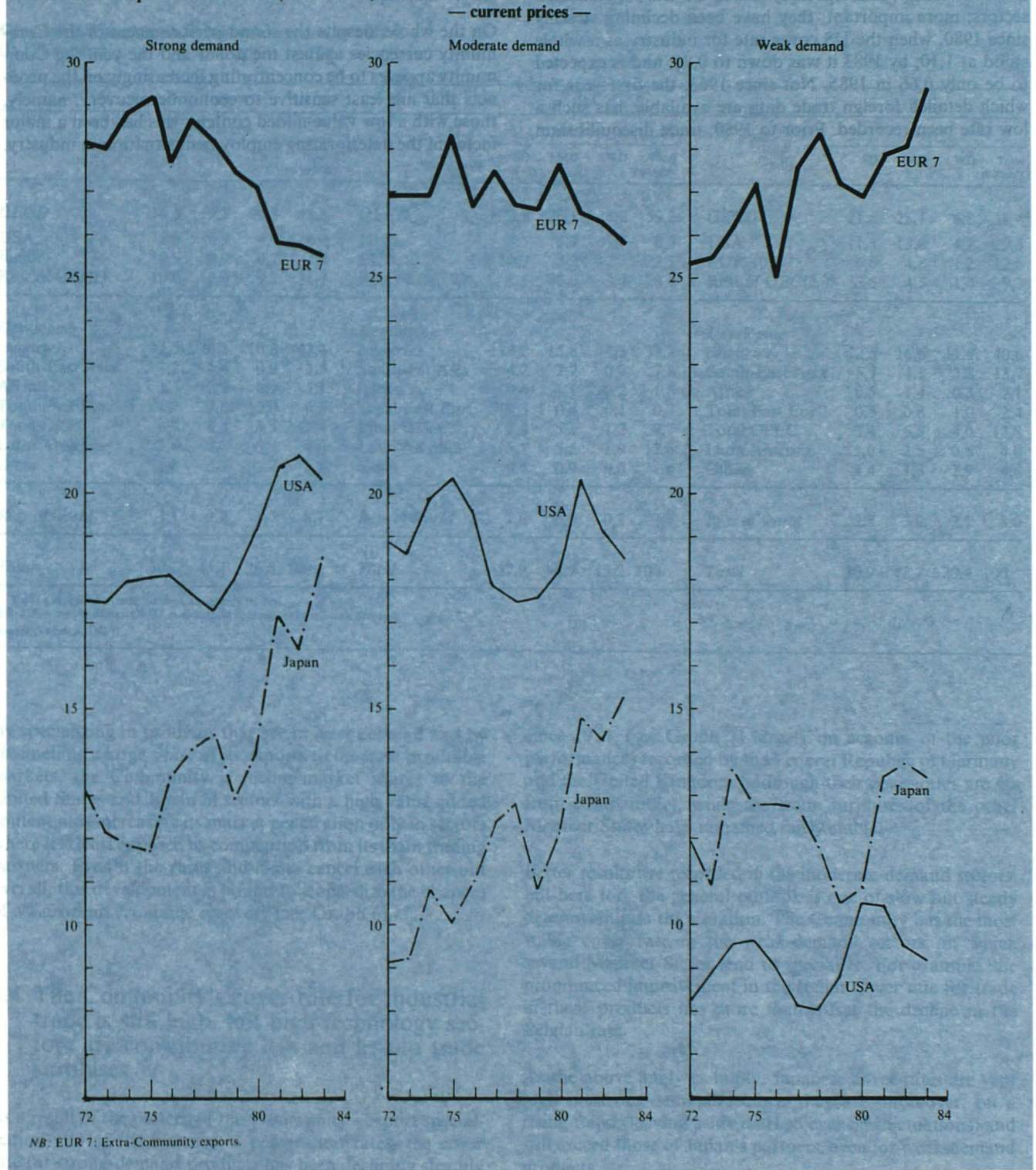
As the above analyses imply, Japanese cover rates are very high in strong-demand sectors, they are, moreover, on a rising trend (leaving aside marked cyclical fluctuations) and still exceed those of Japan's partners, even for weak-demand products.

The cover rates for the United States are lower than those for the Community, and especially low in the less sophisticated sectors; more important, they have been declining steadily since 1980, when the US cover rate for industry as a whole stood at 1,10; by 1983 it was down to 0,81, and is expected to be only 0,66 in 1985. Not since 1963, the first year for which detailed foreign trade data are available, has such a low rate been recorded. Prior to 1980, trade disequilibrium

was most pronounced in 1972 (cover rate: 0,87) and 1978 (cover rate: 0,89).

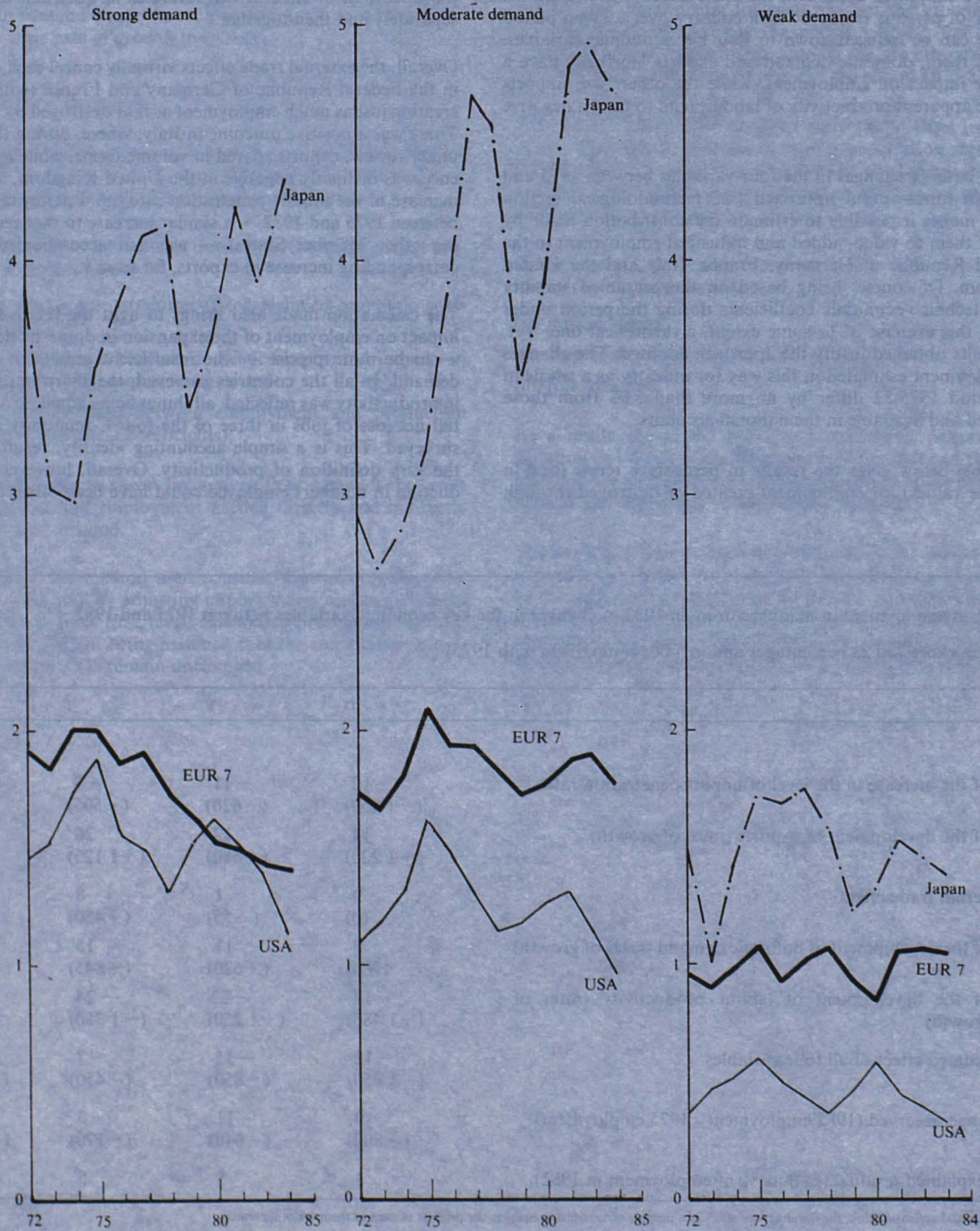
On the whole, despite the sound performances of the Community currencies against the dollar and the yen, the Community appears to be concentrating increasingly on the products that are least sensitive to economic recovery, namely, those with a low value-added content; this has been a major factor in the deteriorating employment situation in industry.

GRAPH 6: Export market shares (OECD area)



GRAPH 7: Cover rates of total imports by total exports

— current prices —



NB: EUR 7: Extra-Community imports and exports.

The main determinants of employment: a tentative quantification

Taking a simplified approach, the main factors influencing the number of persons employed in a country over a given period of time can be reduced down to four key economic variables. Two of them, domestic demand and exports, normally have a positive impact on employment, while the other two, imports and the apparent productivity of labour, tend to have a negative impact.

On the basis of changes in the four variables between 1975 and 1982, an input-output approach (see methodological section below) makes it possible to estimate the contribution made by each of them to value-added and industrial employment in the Federal Republic of Germany, France, Italy and the United Kingdom. Of course, being based on the presumed stability of the technico-economic coefficients during the period under review, this exercise is, to some extent, a theoretical one. Yet, the results obtained justify the approach adopted. The changes in employment estimated in this way for industry as a whole in the period 1975-82 differ by no more than 5 % from those recorded and available in the national accounts.

The table below gives the results in percentage terms (and in absolute values) for employment created or destroyed through

the operation of each of the variables in question, taken first separately and then together.

Overall, the external trade effects virtually cancel each other out in the Federal Republic of Germany and France (with exports creating just as much employment as that destroyed by imports). There was a positive outcome in Italy, where, during the period under review, exports soared in volume terms, while the experience was distinctly negative in the United Kingdom, where the increase in the import penetration rate (up 4 percentage points between 1975 and 1982 — a similar increase to that recorded in the other Member States) — was not accompanied by any corresponding increase in exports, far from it.

The calculation made also brings to light the relatively minor impact on employment of the expansion in domestic demand or — to be more precise — the insufficient growth in domestic demand. In all the countries surveyed, the sharp improvement in productivity was reflected, all things being equal, in a substantial net loss of jobs in three of the four Community countries surveyed. This is a simple accounting identity, resulting from the very definition of productivity. Overall, however, this reduction in numbers employed could have been offset only by a

Impact on employment in manufacturing in 1982 of changes in the key economic variables between 1975 and 1982
(Changes expressed as percentages and in '000; comparison with 1975)

	D	F	I	UK
<i>Impact</i>				
1. of the increase in the level of import penetration rates	-12 (-1 050)	-11 (-620)	-9 (-505)	-13 (-975)
2. of the development of exports (rates of growth)	14 (+1 220)	12 (+680)	20 (+1 125)	4 (+300)
A. External trade effect	0 (0)	1 (-55)	8 (+450)	-10 (-750)
3. of the development of domestic demand (rates of growth)	8 (700)	11 (+620)	15 (+845)	-3 (-225)
4. of the development of labour productivity (rates of growth)	-17 (-1 485)	-22 (-1 250)	-24 (-1 350)	-9 (-675)
B. Estimated effect of all four variables	-12 (-1 050)	-15 (-850)	-7 (-450)	-21 (-1 575)
C. Change observed (1982 employment - 1975 employment)	-9 (-800)	-11 (-640)	-3 (-170)	-21 (-1 565)
E. Unexplained residual (C-B as % of employment in 1982)	3	5	5	0

NB: As an initial approximation, the simultaneous effect of a number of variables is equal to the product of each of them taken separately.
Source: DG II calculations.

much greater change in the volume of domestic demand over the period under consideration. Given the scale of domestic demand in relation to exports, an extra percentage point of growth in demand clearly has a greater impact on employment than the same rate of growth in exports.

Methodological approach

Input-output tables provide a complete and coherent picture of all flows of goods and services produced and traded in an economy during a given period (usually one year).

If the conventional hypotheses underlying the input-output models are accepted, namely:

- (i) fixed production structures (fixed technico-economic coefficients);
- (ii) fixed breakdown between domestic output and imports in each flow, (fixed import shares); and
- (iii) fixed relationships between employment and production (fixed employment coefficients);

it is then possible to show, for a given final demand, the levels of production and employment needed directly and indirectly to satisfy that demand.

In summary, the method used consists of estimating final demand in 1982 and, by adjusting import shares and employment coefficients to their 1982 level, calculating production and employment in 1982, it being assumed that the technico-economic coefficients for 1975 remain unchanged.

As regards final demand, the estimates for 1982 were made as follows:

for exports, by applying for each product the growth rate of exports in volume terms in the period 1975-82; for domestic demand, by applying for each product the growth rate of total domestic demand in volume terms in the period 1975-82.

The import shares were assigned their 1982 values (estimated on the basis of the changes in import penetration rates in the period 1975-82), while the employment coefficients were also assigned their 1982 values (estimated on the basis of changes in the apparent productivity of labour).

Three changes are made; therefore, to the basic input-output model (1975); they relate to:

- (i) import shares,
- (ii) employment coefficients, and
- (iii) final demand.

As a result, the model provides a reasonable picture of the situation in 1982 (any discrepancies between that and the actual situation are an indication of the unsuitability of the hypotheses applied and of the lack of harmonized statistics).

The analysis of the changes that occurred in the period 1975-82 is then taken further by separating the effects on employment of the different parameters in the model. In other words, it is possible, by adjusting in turn the import shares, the employment coefficients and final demand, to gauge separately the impact of each of these adjustments on value-added and employment.

Chapter 2: The determinants of supply in industry in the Community

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The determinants of supply in industry in the Community

Introduction

Taking stock of the Community's trade performance over the past 10 years or so, we find that penetration ratios have risen while export market shares have contracted, particularly for the products that the industrialized countries consume in the largest quantities. These findings are partly explained by an unsuitable import and export specialization and by an unfavourable pattern of trade flows, but those factors are not the deep-seated reasons for the deterioration in industrial competitiveness in the Community. The purpose of this chapter is to attempt an explanation based on a study of the factors of production labour and capital. There are many other factors influencing an economy's competitiveness some of which, such as the dissemination of innovation and technological progress, are analysed elsewhere in this number of *European Economy* (Chapter 4). But an examination of these economic variables produces some unequivocal findings: the industrial base for producing high-technology goods in the Community is too narrow; the share of value-added in industry accounted for by high-technology industries is small compared with the situation in the United States and Japan, and production costs are rising too quickly. Although the substitution of capital for labour has taken place on a large scale, productivity gains are still modest and not sufficient to offset the increase in labour costs, which is harming the cost-competitiveness of European products. Despite the expansion of potential markets, investment in the high-technology sectors has stalled and there has been little growth in the capital stock. The explanation for the unsatisfactory allocation of available capital between the various types of investment may well lie in the relative weakness of the gross rate of return on capital invested in the sectors producing high-technology goods.

1. Main economic features of supply in industry

1.1 Differing growth rates

In all industrialized countries, the buoyancy of demand for the various categories of manufactured goods has played a determining role in economic growth in the different sectors of industry. In the Community, as in the United States and Japan, firms in the sectors whose products were in greatest demand have, on average, enjoyed vigorous growth, expanding in general at a rate two to three times as fast as industry as a whole. While trends were comparable overall from one country to another, rates of growth differed widely in the period 1972-82 (see Graph 1). While the Community and the United States obtained much the same results in all sectors, Japan recorded spectacular growth with the industrial growth-rate differential separating it from the Community standing at 5 percentage points a year (9 points in the case of the strong-demand sectors).

Hence the need for an industrial base mainly or increasingly geared to the manufacture of strong-demand products. The greater the number of firms concentrating on these expanding markets, the more sustained industrial growth will be and the more effectively employment will be safeguarded. But the contribution firms in this sector make to total industrial output in the Community is still limited.

In 1982, value-added in the strong-demand sectors represented only 20 % of total value-added in industry in the Community, compared with 28 % in the United States and 27 % in Japan. Community supply thus already appears to be structurally inadequate bearing in mind that as we saw in Chapter 1, the three areas concerned have internal/domestic markets of comparable size (see Table 1).

Table 1

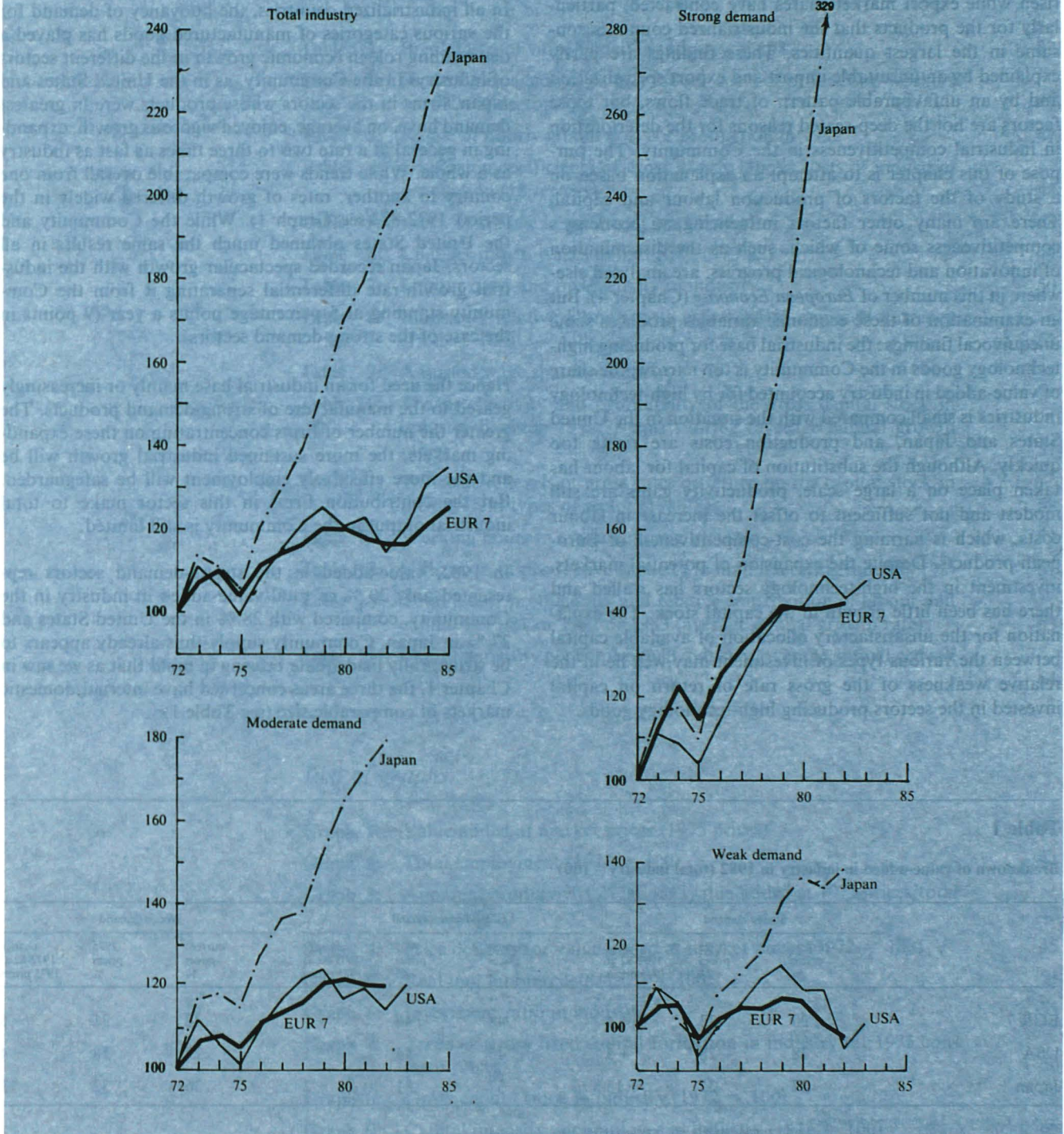
Breakdown of value-added in industry in 1982 (total industry = 100)

	Strong demand			Moderate demand			Weak demand		
	current prices %	1975 prices %	change 1972-82 at 1975 prices	current prices %	1975 prices %	change 1972-82 at 1975 prices	current prices %	1975 prices %	change 1972-82 at 1975 prices
EUR 7	20	23	+ 4	48	46	+ 1	32	31	- 6
USA	28	28	+ 5	45	44	- 1	27	28	- 4
Japan	27	37	+ 15	37	31	- 2	36	32	- 13

Sources: Eurostat and Commission departments

GRAPH 1: Value-added at market prices (1975 prices) 1972 = 100

(EUR 7 in ECU, the United States and Japan in national currencies)



Even at constant prices, the strong-demand sectors account for a smaller percentage of value-added in industry in Europe than the other two categories. In the United States and the Community alike, the moderate-demand sectors make up the bulk of value-added. In Japan, however, the share of value-added at 1975 prices accounted for by firms producing goods in greatest demand has suddenly ballooned, exceeding by 5 points that recorded for the weak-demand sectors and by 6 points that of moderate-demand sectors. The strong-demand sectors now make up 37 % value-added in industry in Japan (at 1975 prices).

The strong-demand sectors

Growth rate differentials in the high-technology sectors (automated office equipment, information technology, electrical equipment and electronics, chemicals, pharmaceuticals) tended to widen, at the Community's expense, towards the end of the period.

In 1982, the disparity between the Community and the United States as regards the volume of output in this category expressed as a percentage of total industrial output stood at 5 points (compared with 4 points in 1972) while the disparity between the Community and Japan was 14 points in 1982 (compared with 3 points in 1972).

These results bear witness to Europe's vulnerability and to the difficulties experienced by Community industrialists in taking advantage of the opportunities available on these expanding markets. Up to 1974, the Community's growth performance for value-added was identical to that of its international competitors. However, the Community has not yet genuinely absorbed the consequences of the oil shocks. Nor did the United States avoid altogether the industrial slowdown after 1979, but its growth rate did remain positive (1,7 % a year between 1979 and 1982). In Japan, on the other hand, growth expanded even more rapidly (with value-added by firms in these sectors rising by 15 % a year in real terms over the past few years).

Moderate-demand sectors

These sectors represent between 45 % and 50 % of value-added in industry in the Community and in the United States, but only 37 % in Japan. These figures illustrate their importance in the industrial fabric of the first two areas as well as the impact that somewhat sluggish demand for moderate-demand products has on the general level of activity. Admittedly, the growth differential between Japan, on the one hand, and the Community and the United States, on the other, is less marked in these sectors, than in the

strong-demand sectors, but it still averages 5 points a year. The gap is manifestly wider between the United States and Japan as far as the motor vehicle industry is concerned and between the Community and Japan for industrial machinery.

Weak-demand sectors

These sectors which manufacture for the most part intermediate products and mass-consumption products such as textiles and clothing, (and which showed little signs of buoyancy as far back as the early 1970s) have seen the growth rate of their value-added plunge after 1979, except in Japan, which actually performed better than in the period 1972-79 in most of the sectors under consideration. Japan's ability to steer clear of the affects of the slowdown in the growth of economic activity and world trade after the second oil shock is just as striking in the weak-demand as in the moderate-demand and strong-demand sectors. The situation in the Community closely resembles that in the United States. However, the decline in the weak-demand sectors has probably contributed all the more greatly to holding down the growth of industrial output in Europe, as they account for a larger share of value-added at current prices than the strong-demand sectors.

1.2 The deterioration in industrial employment in the Community

The slack growth of industrial output after the first oil shock had a major impact on industrial employment in the Community. With an index of 100 in 1972, industrial employment in the Community was probably down to 80,3 in 1985, a loss of 5,9 million jobs in less than 13 years. The corresponding indices for the United States and Japan are 103,5 and 105,8 respectively (see Graph 2).

The numbers employed in industry in Europe have been declining steadily since the early 1970s, and no net creation of industrial jobs has occurred in the Community as a whole since 1973. The rate of job losses actually gathered further momentum after the second oil shock (from 1,2 % a year in 1973-79 to 2,6 % a year thereafter). In 1972, 30,1 million people were working in industry—a figure that had only once been exceeded since 1950, and then only slightly (30,8 million in 1970). By 1985, the figure had fallen to only 24,2 million. At no time in the intervening 10 years or so did it approach its 1972 level. The other sectors of the economy, and in particular market services, managed to offset only 80 % of the job losses in industry. The number of jobs available thus fell a long way short of being able to accommodate the growth in the labour force.

The second feature of industrial employment in the Community has been that the contraction was on a broad front, affecting all sectors. In the strong-demand sectors and to a lesser extent, in the moderate-demand sectors, job creation continued until 1974, but ever since job losses have proliferated in all sectors.

Even in the strong-demand sectors that performed best, such as automated office equipment and information technology, or electrical equipment and electronics, manpower was reduced by 16 % between 1974 and 1982. The smallest (percentage) contraction was in transport equipment, where the numbers employed fell by only 10 % over that period.

Job losses were, of course, highest (over 60 % of all jobs lost) in the weak-demand sectors, which account for 40 % of industrial employment; half of the losses were concentrated in textiles and clothing. Italian industry (between 1972 and 1982) was the exception here; only 80 000 jobs disappeared in textiles and clothing (compared with 420 000 in the United Kingdom and in the FR of Germany), while new jobs were actually created in the steel and metal goods sectors.

Apart from differences in rates of contraction or in the timing of major job-shedding operations, the situations in the countries of the Community are very similar: industry no longer seems able to play the same active role on the employment front as during the 1960s. Despite some pick-up in industrial activity, almost all the latest data available on sectoral employment, point to a downward trend.

By the end of 1984, industrial employment was more than 10 % down on its 1980 level in all the Community countries except Denmark, with the largest losses being recorded in the United Kingdom. In early 1985, therefore, employment in the Community stood at its lowest level ever.

Available estimates do, however, suggest some turnaround in the trend in 1985. There will probably be renewed job creation in industry in Germany, the Netherlands and Denmark (indeed, such a development was discernible in Denmark back in 1984), while labour-shedding should slow down markedly in Belgium and the United Kingdom. The balance of net changes in employment in the Community will probably remain negative, however, since the trough does not yet appear to have been reached in Italy and, especially, in France.

The extreme flexibility of employment in the United States is in marked contrast with the steady decline in the number of persons employed in manufacturing in Europe. Over 12 years, US industrial employment fluctuated in line with

business cycles: almost 700 000 jobs created between 1970 and 1973; 1,7 million lost between 1973 and 1975; 2,8 million created between 1975 and 1979; and 2,6 million lost between 1979 and 1983. The economic recovery in 1984 led to a further expansion of industrial employment as 1 million new jobs were created in 1984 and 1985.

US industry also differs from industry in the Community in that it displays strong discrepancies between sectors. Between 1975 and 1982, a period of major fluctuations, the various sectors recorded significantly different rates of job creation or elimination. The growth employment in the strong-demand sectors was spectacular compared to the situation in Europe: 1,6 % a year over 10 years, with a record 2 % a year between 1975 and 1980. Even in the moderate-demand sectors, job creation was far from negligible at 0,5 % a year.

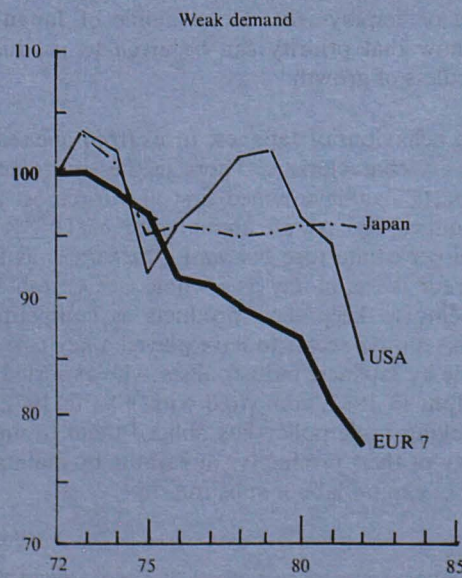
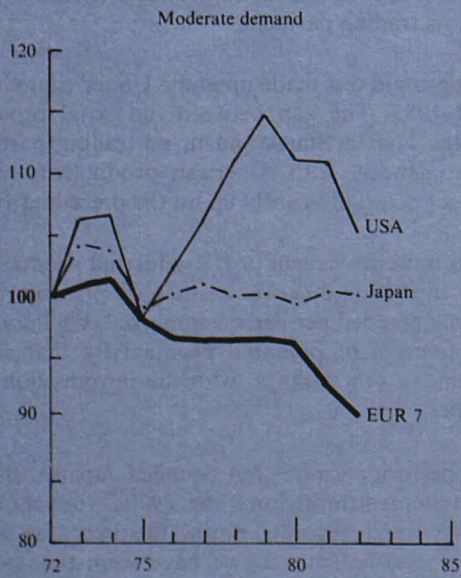
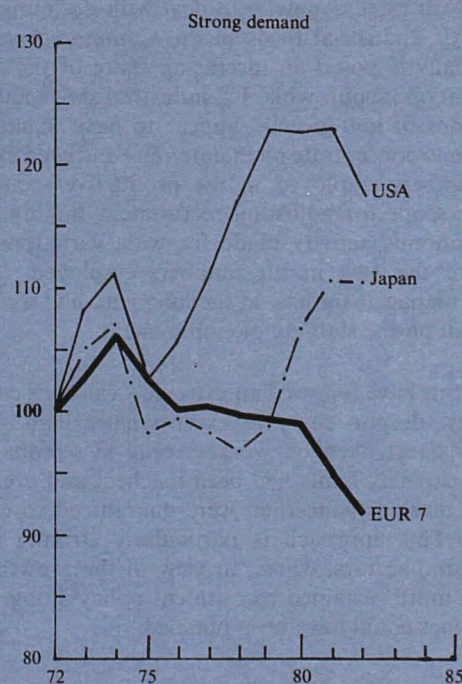
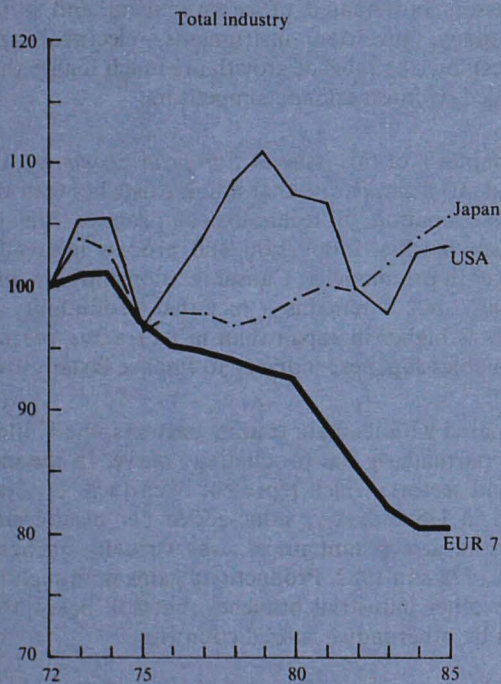
Although quite a large number of jobs were axed in the weak-demand sectors, a revival in economic growth such as that observed from 1975 to 1980 led to a renewal of recruitment, even in those low-growth sectors, a development yet to get under way in the Community.

In the long-run, this has resulted in a reallocation of manpower between industrial sectors in the United States, to the benefit of the growth sectors. The shift in employment from sectors where value-added is rising only slowly to sectors undergoing a period of expansion has helped to sustain productivity growth in US industry without employment bearing the brunt of this development as it has done in the Community.

Manpower management in Japanese industry remained a model of stability, at least until 1982. Fluctuations from one year to the next in the numbers employed were very small, averaging 0,1-0,2 % a year. Since 1982, job creation has gained momentum, and employment expanded by almost 2 % a year between 1982 and 1985. The number of persons employed in Japanese industry in 1985, is expected to reach a record 12,2 million, a figure that was approached only once (12 million in 1973) during the entire period 1960-84.

The stability of employment in industry as a whole in Japan is very much reflected in the situation at sectoral level. In 1975, industrial employment in Japan contracted sharply in all sectors. It was not until 1979 that very robust growth in the strong-demand sectors led to new job creation, but at a rate normally associated with Japan, namely, 4,2 % a year between 1979 and 1982. This figure contrasts markedly with the 0,1 % recorded in the United States and especially with the 2,5 % decline recorded in the Community.

GRAPH 2: Total employment (1972 = 100)



Altogether, in the Community, the United States and Japan alike, it is as though a major, but manifestly different, role has been assigned to employment in the adjustment policies adopted by all three countries to deal with declining economic growth. Industrial firms in the Community seem to have gradually imposed an increasing share of the adjustment burden on labour, while US industrialists, facing similar conditions of low growth, appear to have managed in the long run to concentrate on maintaining and even expanding the numbers employed in the productive sector. Although the scope for adjusting recruitment rapidly to the level of economic activity made for wide variations from one year to the next in the numbers employed, flexible manpower management has, in the long run, had a positive effect overall on the stability of employment.

Japanese firms have followed an extremely cautious employment policy, despite enjoying exceptionally high growth rates. They have taken on workers only in sectors where productive capacity limits had been reached, and even then only if the markets concerned were guaranteed to expand vigorously. This approach is particularly striking in the strong-demand sectors, where, in view of the growth rates achieved, a more sustained recruitment policy along US or European lines could have been pursued.

1.3 Trade-off between employment and productivity

At the macroeconomic level, productivity can be maintained at a certain level during a period of low growth, only at the expense of employment. The example of Japan does, however, show that priority can be given to productivity gains, regardless of growth.

The varying behaviour of Japanese firms from one sector to another is very characteristic. Those in the strong-demand sectors in particular have aimed first and foremost at improving productivity. At an annual rate of 11,3 % their value-added per capita rose two and a half times as fast as the average for the economy as a whole (see Graph 3), the intention being to keep their products as competitive as possible. This motive seems to have played a key role in the choices made by Japanese industrialists, who exported 14 % of their output in 1982, compared with 9 % in 1972. This outward-looking trade policy has obliged them to improve the efficiency of their productive apparatus by maintaining a high level of capital/labour substitution.¹

¹ For a detailed description of this bank see 'Studies of national accounts — No 4 Structural Data Base. Tables by branch 1960-1981', Eurostat, 1984.

The spectacular growth of sectoral productivity in Japan, which actually accelerated after 1979, is associated primarily with the sectors that are linked to the development of micro-processors (automated office equipment and information technology, precision instruments, electrical and electronics), but the rates of growth are much higher than those recorded by international competitors.

In Chapter 4 of this issue of *European Economy* an attempt is made to demonstrate that a link exists between the speed of dissemination of technological progress, the trade-off between product innovation and process innovation, and changes in productivity. Causal relationships are difficult to establish, but it remains a fact that profitability in those sectors is higher in Japan than in its trading partners, and this enables Japanese industry to finance faster growth.

Compared with its main trading partners, the United States has a particularly flat productivity curve. In the moderate-demand sectors, which represent over 45 % of total value-added in US industry, value-added per person employed, expressed at constant prices, was virtually unchanged between 1972 and 1982. Productivity gains were slightly higher in the other industrial branches, but still below those recorded by other industrialized countries.

These differences in behaviour are due partly to the fact that the domestic market absorbs over 90 % of US industrial output, but such disparities in the rate of productivity gains undermine the US economy and accentuate the competitive pressure exerted by non-US products despite the fact that, in terms of level, US industrial productivity remains ahead of that of its trading partners.

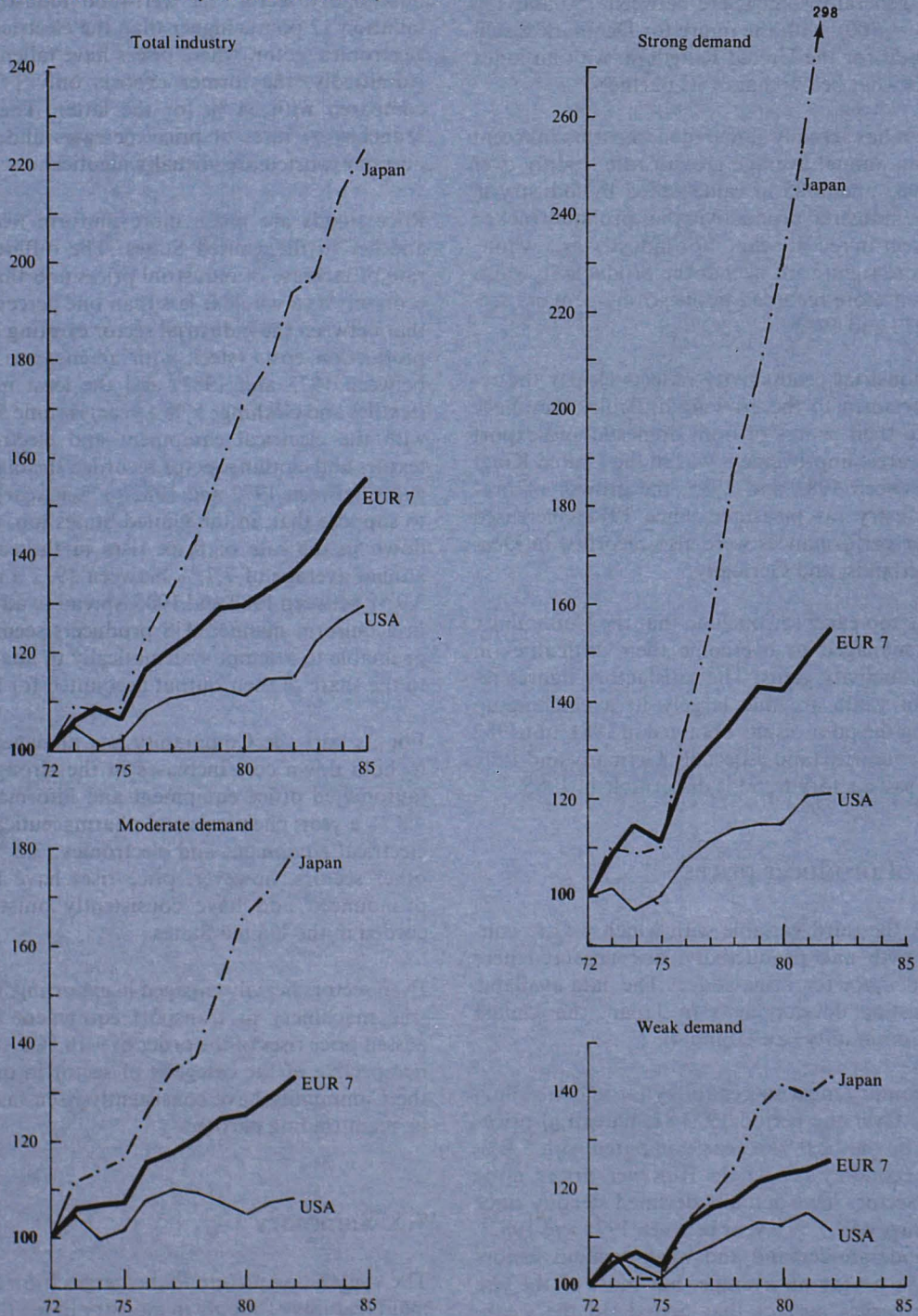
Some lost ground was made up in the United States between 1983 and 1985. The gap between industrial productivity gains in the United States and in its trading partner was reduced somewhat, with American productivity rising by over 3 % a year, significantly up on the preceding 10 years.

The vigorous improvement in US industrial productivity, in particular in 1983 (3,2 %) shows that, despite the very high levels of value-added per person employed, US industry still has vast reserves of potential productivity that could be tapped, among other things, with the introduction of new technologies.

While its performance has not equalled Japan's, the Community attempted, throughout the 1970s, to maintain the productivity trends recorded during the preceding period of economic expansion but, as we have seen, this entailed a stringent policy of job retrenchment. As external markets hold the key to sustained economic activity, each Member

GRAPH 3: Apparent productivity of labour (value-added at 1975 prices/total employment) (1972 = 100)

(EUR 7 in ECU, for the United States and Japan, national currencies)



State has been obliged to seek a steady improvement in productivity. The strong-demand sectors have pursued this objective in systematic fashion. The index of productivity in these sectors is generally somewhere between 150 and 170 (base year 1972 = 100), with the figure for Denmark reaching 200. The result for the United Kingdom, with an index of 138, was somewhat below that of its partners.

This development has actually gathered momentum in recent years. Despite an annual average growth rate slightly over 2 % between 1982 and 1985 in value-added by industry in the Community, industrial productivity has probably picked up by 4,5 % a year in recent years. For industry as a whole, this is all the more significant in that the productivity gains achieved matched those recorded in the strong-demand sectors between 1972 and 1982.

The trend of industrial productivity reflects clearly the response of businessmen to the growing difficulty they have in holding on to their shares of both domestic and export markets. The clearest improvement was in the United Kingdom, where, between 1983 and 1985, the growth of productivity in industry (as measured since 1972) increased fourfold. Similar performances were also recorded in Denmark, the Netherlands, and Germany.

For all that, it is too early to conclude that the Community countries have managed to overcome their difficulties in maintaining productivity gains. The satisfactory figures recorded in recent years are due largely to a catching-up process following the poor results obtained in 1981 and 1982 in a number of countries (and especially Germany and Italy in 1983). A less satisfactory trend is discernible in 1985.

1.4 Control of producer prices

Producer prices, the third variable with which we are concerned after growth and productivity, are measured here using the price deflator for value-added. The data available highlight contrasting developments in Japan, the United States and the Community (see Graph 4).

Japan was the country most successful by far in controlling producer prices. Over the period 1973-82, industrial prices rose on average by only 2,6 % a year, compared with 6,1 % for prices in the economy as a whole. However, prices in the strong-demand sectors have actually declined steadily since 1975 (by an average of 4,7 % a year between 1975 and 1982). Prices in the moderate-demand and weak-demand sectors rose by over 4 % a year on average, but most of the rise occurred in the earlier part of that period. In the weak-demand sectors, prices were virtually stable between 1974 and 1982 (an increase of 1,1 % a year).

Sectoral price differences are very pronounced, however, and depend on the degree of exposure to foreign competition: with its prices rising by 7,3 % a year, the most inflationary sector, the agri-food industry, has a rate of inflation 12 points higher than the electrical equipment and electronics sector, where prices have fallen by 4,8 % a year. Admittedly, the former exports only 1 % of its output, compared with 31 % for the latter. The classification of branches by rates of price increases and that by share of output exported are virtually identical.

Price trends are much more uniform from one sector to another in the United States. The difference between the rate of increase of industrial prices and that of prices in the economy as a whole is less than one percentage point, while that between the industrial sector exerting least control over production costs (steel, with an increase of 9,8 % a year between 1973 and 1982) and the least inflationary sector (textiles and clothing: 5 % a year) is some 5 points. Together with the electrical equipment and electronics sector, the textiles and clothing sector recorded the highest productivity gains between 1972 and 1982 (3 % a year). It is reasonable to suppose that, in the United States too, the marked slowdown in the rate of price rises in the economy, from an annual average of 7,7 % between 1972 and 1982 to one of 3,9 % between 1982 and 1985, spread to all sectors, probably in a uniform manner. US producers seem either unwilling or unable to attempt systematically to adapt price increases to the share of their output accounted for by exports.

For its part the Community has managed to some extent to hold down cost increases in the strong-demand sectors (automated office equipment and information technology: 4,8 % a year; chemicals and pharmaceuticals: 6,9 % a year; electrical equipment and electronics: 7,2 % a year). In the other sectors, however, price rises have been much more pronounced and have consistently outstripped those recorded in the United States.

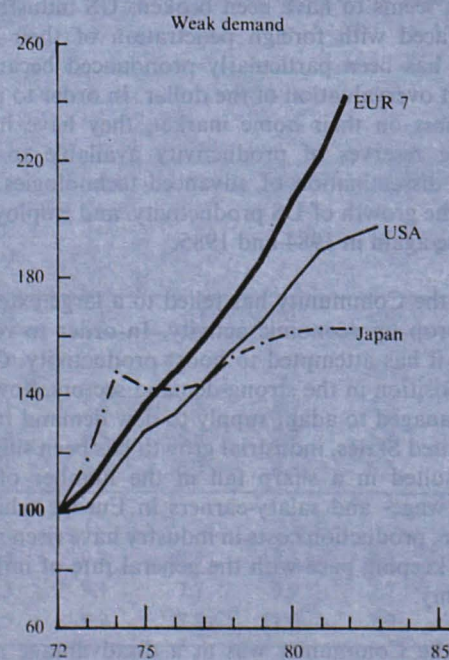
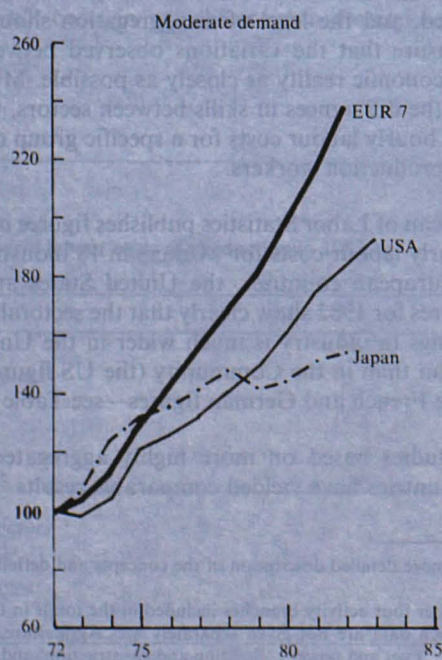
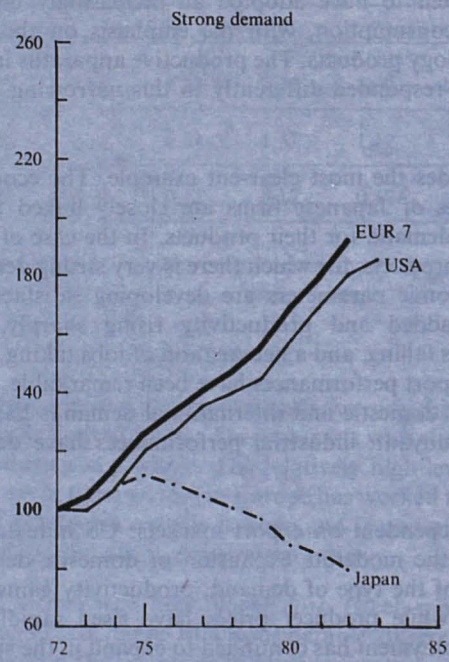
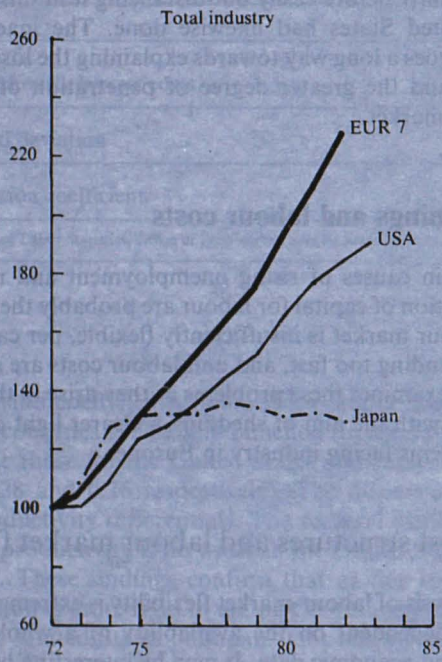
Even sectors heavily engaged in exporting, such as the industrial machinery or transport equipment sector, have witnessed price rises of the order of 9-10 % a year. At all events, irrespective of the category of sector in question, prices in the Community have consistently risen faster than those in its main trading partners.

1.5 Summary

The contrasting picture that emerges from an analysis of the main features of supply in industry in the three main trading partners, namely, the Community, the United States and Japan, is not very flattering for Europe as a whole.

GRAPH 4: Price deflator for value-added at market prices (1972 = 100)

(EUR 7 in ECU, for the United States and Japan, national currencies)



After the years of broadly based expansion up to the early 1970s, what buoyant demand there was gradually focused on a narrower range of industrial products. Potential markets contracted and competition grew keener. The industrialized countries seem to have adopted an increasingly uniform pattern of consumption, with the emphasis on the same high-technology products. The productive apparatus in each country has responded differently to this narrowing of the market.

Japan provides the most clear-cut example. The economic performances of Japanese firms are closely linked to the intensity of demand for their products. In the case of high-technology products, for which there is very strong demand, all the economic parameters are developing satisfactorily, with value-added and productivity rising sharply, production costs falling, and a net creation of jobs taking place. Here too, export performances have been remarkable. More generally, as domestic and international demands have become less buoyant, industrial performances have deteriorated.

Being less dependent on export markets, US industry has adjusted to the moderate expansion of domestic demand. Regardless of the type of demand, productivity gains have been small while producer prices have risen rapidly. By contrast employment has continued to expand in the strong-demand and moderate-demand sectors despite marked cyclical fluctuations. Only firms in the weak-demand sectors have announced large-scale redundancies. Since 1983, this long-term pattern seems to have been broken. US industrialists have been faced with foreign penetration of their home market that has been particularly pronounced because of the persistent overvaluation of the dollar. In order to regain competitiveness on their home market, they have had to draw on the reserves of productivity available to them through the dissemination of advanced technologies. This has revived the growth of US productivity, and employment started to rise again in 1984 and 1985.

Like Japan, the Community has relied to a large extent on exports to prop up economic activity. In order to remain competitive, it has attempted to boost productivity. Owing to its poor position in the strong-demand sectors, however, it has not managed to adapt supply to new demand trends. As in the United States, industrial growth has been sluggish. This has resulted in a sharp fall in the number of jobs available to wage- and salary-earners in Europe while, at the same time, production costs in industry have risen markedly, all but keeping pace with the general rate of inflation in the economy.

Industry in the Community was at a disadvantage at the outset when it came to meeting this new type of demand for

products with a high-technology content, its output of such products being limited. However, the expansion of supply in the Community, far from adding to the output of such products, has been so modest that Japan caught up with the Community before easily out-distancing it in this respect, as the United States had likewise done. The inadequacy of supply goes a long way towards explaining the loss of market shares and the greater degree of penetration of the Community market.

2. Earnings and labour costs

The main causes of rising unemployment and more rapid substitution of capital for labour are probably the following: the labour market is insufficiently flexible, per capita wages are expanding too fast, and unit labour costs are rising. This section examines these problems as they arise in the different sectors, with the aim of shedding a clearer light on the type of problems facing industry in Europe.

2.1 Cost structures and labour market flexibility

An analysis of labour-market flexibility is extremely complex and is dependent on the availability of a whole range of social and economic data. It may be interesting here to look at the sectoral dispersion of labour costs and at how they have evolved over time. However, for this we need harmonized data on all the sectors and countries with which we are concerned, and the level of disaggregation should be such as to ensure that the variations observed between sectors reflect economic reality as closely as possible. Moreover, in view of the differences in skills between sectors, we need to take the hourly labour costs for a specific group of workers, namely production workers.

The Bureau of Labor Statistics publishes figures on harmonized hourly labour costs for workers in 18 industrial sectors in six European countries, the United States and Japan.¹ The figures for 1982 show clearly that the sectoral dispersion of earnings in industry is much wider in the United States and Japan than in the Community (the US figure is almost twice the French and German figures—see Table 2).

Other studies based on more highly aggregated data for fewer countries have yielded comparable results.²

¹ For a more detailed description of the concepts and definitions used see annex.

² The other four activity branches included in the totals in the tables, but for which data are not given separately are 'Agriculture, forestry and fishing', 'Fuel and power', 'Building and construction' and 'Non-market services'.

Table 2**Sectoral dispersion of hourly labour costs of production workers in 1982 (18 sectors)**

	<i>(in US dollars/hour)</i>							
	B	D	F	I	NL	UK	USA	Japan
1. Average hourly labour costs	9,07	9,76	7,69	7,21	9,37	6,64	11,13	5,57
2. Standard deviation	1,57	1,46	1,11	0,81	1,57	1,12	3,15	1,45
2/1 Dispersion coefficient	0,17	0,15	0,14	0,11	0,17	0,17	0,28	0,26

Source: Bureau of Labor Statistics, Office of Productivity and Technology; data for 18 industrial sectors.

The dispersion coefficients obtained for labour costs in the European countries are closely bunched (in the range 0,11-0,17); while those for the United States and Japan are very similar (0,28 and 0,26 respectively). The dispersion is not due to productivity differentials. The sectoral dispersion of per capita productivity is no wider in the United States than in Europe. These findings confirm that at this level wage determination is more rigid in all the Community countries, than in the United States or Japan. This has several consequences for the sectors in the upper and lower reaches of the league table of labour costs (see Table 3):

(i) *In the sectors with low labour costs* (clothing, footwear, furniture), costs in some European countries, notably

Germany and the Netherlands, were higher than those in the United States. This contrasts with the findings for industry as a whole. The relatively high level of labour costs in these sectors in Europe has worked to the benefit of producers outside Europe and is one of the reasons behind the rise in penetration ratios.

(ii) *In sectors with high labour costs* (steel, motor vehicles, chemicals), there is a considerable difference in costs between the countries in Europe, on the one hand, and the United States on the other. In Japan labour costs in these sectors in 1982 were comparable to those in Europe, while labour costs in the clothing sector were much lower.

Table 3**Range of hourly labour costs of production in 1982**

	<i>(in US Dollars/hour)</i>							
	B	D	F	I	NL	UK	USA	Japan
<i>Low-cost sectors</i>								
Clothing	6,3	7,1	5,6	5,8	6,7	4,5	6,5	2,9
Footwear	7,2	7,4	6,3	5,8	7,7	5,4	6,6	:
Furniture	:	10,1	6,4	6,3	8,2	6,5	8,1	4,5
<i>High-cost sectors</i>								
Steel	12,1	11,6	9,8	8,7	12,5	8,2	22,7	9,9
Motor vehicles	10,9	13,3	9,1	7,7	9,9	7,7	18,7	7,2
Chemicals	10,4	11,5	9,2	7,8	11,0	7,9	13,9	8,5

Source: Bureau of Labor Statistics.

As one way of remaining competitive in the face of rapidly escalating labour costs, a number of European firms in the low-cost and high-productivity sectors have taken advantage of this situation. In Italy, for example, the increase in labour costs in the strong-demand sectors (electrical equipment and electronics, information technology) has remained very moderate.

In the long run, however, there may be a movement towards alignment in hourly labour costs between sectors or their dispersion may become increasingly pronounced, depending on both productivity differentials and the labour-market situation in each sector. In the case of the countries in Europe for which long time series on the trend of labour costs are available,¹ the figures for 18 different industrial sectors (General Industrial Classification of Economic Activities within the European Communities - NACE) show clearly that, all in all, the dispersion of hourly labour costs in production has changed little over time (see Table 4).

Table 4

Dispersion coefficients of gross hourly labour costs of industrial production (18 sectors)

	B	D	F	I	NL	UK ¹
October 1972	0,16	0,10	0,15	0,16	0,11	0,16
April 1983	0,14	0,12	0,13	0,08	0,10	0,15

¹ October 1982 instead of April 1983.

NB. The dispersion coefficient is the ratio of the standard deviation to the average.

Source: Eurostat - Average gross hourly earnings actually paid to workers (industry).

In most European countries, agreements uniformly linking wages to prices and the existence of a guaranteed minimum wage in all industrial sectors have had the effect of tightly compressing differentials. This is particularly true in Italy and, to a lesser extent, in France and Belgium. An alternative approach to analysing the rigidity of cost structures and labour-market mechanisms is to measure how quickly the pattern of sectoral employment changes. Table 5 compares indices of the change in industrial employment for two periods: 1973-76 and 1979-82. The higher the index, the more the relative shares of the various sectors in total employment have changed over the period. A country in which industrial employment shows a marked fall but in which unemployment affects all sectors equally (in proportional terms) will have a low index of change.

¹ To improve the estimation of changes in longer-term trends the figures are based on three-year moving averages.

Table 5

Index of change in industrial employment

	B	D	F	I	NL	UK	USA	Japan
1973-76	10,5	6,9	4,8	3,4	5,9	6,1	7,0	8,2
1979-82	5,1	5,3	3,4	4,2	5,6	7,2	7,2	6,3

NB: The index of change is calculated using the expression $\sum [S_{it} - S_{i,t-1}]$ where S_{it} is the share of industrial sector i (13 industrial sectors in the NACE classification) in total industrial employment in year t . Absolute values have been aggregated.

Sources: Eurostat and Commission departments.

As a measure of labour-market rigidity, this index is far from perfect. However, it does provide confirmation that, on the whole, the sectoral structure of industrial employment is more rigid in Europe than in the United States and Japan. The structure is especially rigid in Italy and France. The index for the UK is also very high, but this is a result of the marked loss of employment in certain traditional sectors.

It is interesting to see how per capita earnings have responded to changes in the structure of industrial employment. According to the classical approach, the lower (higher) the level of unemployment in a particular sector in relation to total industrial unemployment, the higher (lower) the growth of wages in that sector in relation to the figure for industry as a whole.²

In fact there does not seem to be any simple relationship between a particular variable (here, the labour market situation) and the increase in per capita earnings (see Table 6).

In the sectors where real wages have risen rapidly, a number of factors have undoubtedly made themselves felt at different levels: trade-union power (e.g. in the printing and paper sector in the United Kingdom and Belgium), comparatively sound competitive position (e.g. in the textile sector in Italy and in the agri-food sector in France), vigorous expansion of demand (e.g. in the transport equipment sector in Germany and France).

Similarly, just as many reasons can be put forward to explain the wages in some sectors: competition from countries where labour is cheap (e.g. textiles in Belgium, Germany and the United Kingdom); a marked contraction in demand (e.g.

² The average annual growth rates of the price indexes of gross value-added for market services and manufacturing, between 1970-72 and 1980-82, were 9,5% and 8,5% for the Community, and 6,8% and 6,0% for the United States.

building materials in Germany and the Netherlands); low profitability (e.g. steel in France and Belgium). It is not surprising, therefore, that real wage increases do not show

any particular pattern in the three categories of sector defined according to the demand for their products (see Table 7).

Table 6

Changes in real wages in industry 1973-82
(in brackets: average annual growth rates)

		High growth rate of earnings		Low growth rate of earnings	(%)
B	Paper, packaging	(5,6)	Metal products		(2,6)
	Information tech., precision & office equip.	(5,5)	Steel and metal ores		(3,7)
	Industrial machinery	(5,2)	Textiles, leather and clothing		(3,7)
DK	Information, tech., precision & office equip.	(4,5)	Non-metallic minerals		(2,6)
	Rubber, plastics	(3,9)	Steel and metal ores		(1,9)
	Electrical equipment and electronics	(3,6)	Transport equipment		(2,0)
D	Paper, packaging	(4,0)	Food products		(2,1)
	Rubber, plastics	(3,9)	Non-metallic minerals		(2,4)
	Transport equipment	(3,9)	Textiles, leather and clothing		(2,4)
F	Transport equipment	(6,0)	Steel and metal ores		(1,7)
	Food products	(5,3)	Information tech., precision & office equip.		(1,9)
	Chemicals	(4,2)	Electrical equipment and electronics		(2,0)
I	Textiles, leather and clothing	(3,6)	Transport equipment		(-0,5)
	Non-metallic minerals	(3,5)	Steel and metal ores		(0,5)
	Food products	(3,0)	Chemicals		(0,7)
NL	Information tech., precision & office equip.	(3,5)	Transport equipment		(1,4)
	Textiles, leather and clothing	(2,9)	Non-metallic minerals		(1,5)
	Electric equipment and electronics	(2,6)	Paper, packaging		(1,7)
UK	Metal goods	(4,2)	Information tech., precision & office equip.		(0,0)
	Food products	(4,2)	Textiles, leather and clothing		(0,9)
	Paper, packaging	(4,0)	Transport equipment		(1,3)
EUR 7	Food products	(3,7)	Steel and metal ores		(2,0)
	Transport equipment	(3,6)	Information tech., precision & office equip.		(2,3)
	Paper, packaging	(3,6)	Textiles, leather and clothing		(2,4)
USA	Chemicals	(1,8)	Textiles, leather and clothing		(0,0)
	Steel and metal ores	(1,8)	Paper, packaging		(0,4)
	Metal goods	(1,4)	Rubber, plastics		(0,5)
Japan	Food products	(4,9)	Non-metallic minerals		(2,9)
	Industrial machinery	(4,8)	Electrical equipment and electronics		(3,8)
	Information, tech., precision & office equip.	(4,7)	Metal goods		(4,0)

Sources: Eurostat and Commission departments.

NB: Real wages are defined here as the compensation of employees deflated by the GDP price deflator.

Table 7

Labour costs and productivity in industry (average annual growth rate for the period between 1972-73/1981-82)

	Strong-demand sectors			Moderate-demand sectors			Weak-demand sectors		
	Real wages	Apparent productivity of labour	Real unit labour costs	Real wages	Apparent productivity of labour	Real unit labour costs	Real wages	Apparent productivity of labour	Real unit labour costs
B	4,5	4,9	-0,4	4,5	4,1	0,4	4,0	4,9	-0,9
DK	3,4	6,9	-3,3	2,4	3,4	-1,0	2,9	4,1	-1,1
D	3,6	4,2	-0,6	3,4	2,6	0,7	2,8	2,2	0,6
F	2,9	4,5	-1,6	4,9	3,6	1,3	2,3	2,4	-0,1
I	1,1	5,0	-3,7	1,4	2,1	-0,7	3,0	2,7	0,3
NL	2,4	3,6	-1,2	2,0	4,1	-2,0	2,4	3,6	-1,2
UK	1,7	2,6	-0,9	1,2	1,0	0,3	1,4	0,4	1,0
EUR 7	2,7	4,3	-1,5	3,1	2,7	0,4	2,4	2,2	0,1
USA	1,3	2,0	-0,8	0,9	0,6	0,3	1,1	1,1	-0,0
Japan	3,8	11,3	-6,7	4,6	5,8	-1,1	4,0	3,6	0,4

Sources: Eurostat and Commission departments.

2.2 Real unit labour costs

As long as real wages move in line with changes in value-added per person employed, the share of earnings in value-added in industry remains constant. In Japan, the spectacular improvement in the apparent productivity of labour (value-added per person employed) thus paved the way for large increases in real wages. It is generally considered that a decline in real unit labour costs (defined as the ratio of real wages to labour productivity) is conducive to a rise in employment.¹ Accordingly, the growth in unemployment in Europe in recent years is thought to be due in part to rising unit labour costs.

The trend of real unit labour costs has differed significantly from one sector to another, the weak-demand sectors having been more adversely affected than the other sectors (see Graph 5 and Table 7). The difference is particularly pronounced in Japan, where real unit labour costs fell by 6,7 % in the strong-demand sectors (compared with a decline of 1,5 % in the Community) and rose by 0,4 % in the weak-demand sectors (compared with an increase of 0,1 % in the Community). While they fell in the strong-demand sectors in all the countries studied, and especially in Italy, Denmark and Japan, real unit labour costs rose slightly on average in the weak-demand sectors in the Community and Japan.

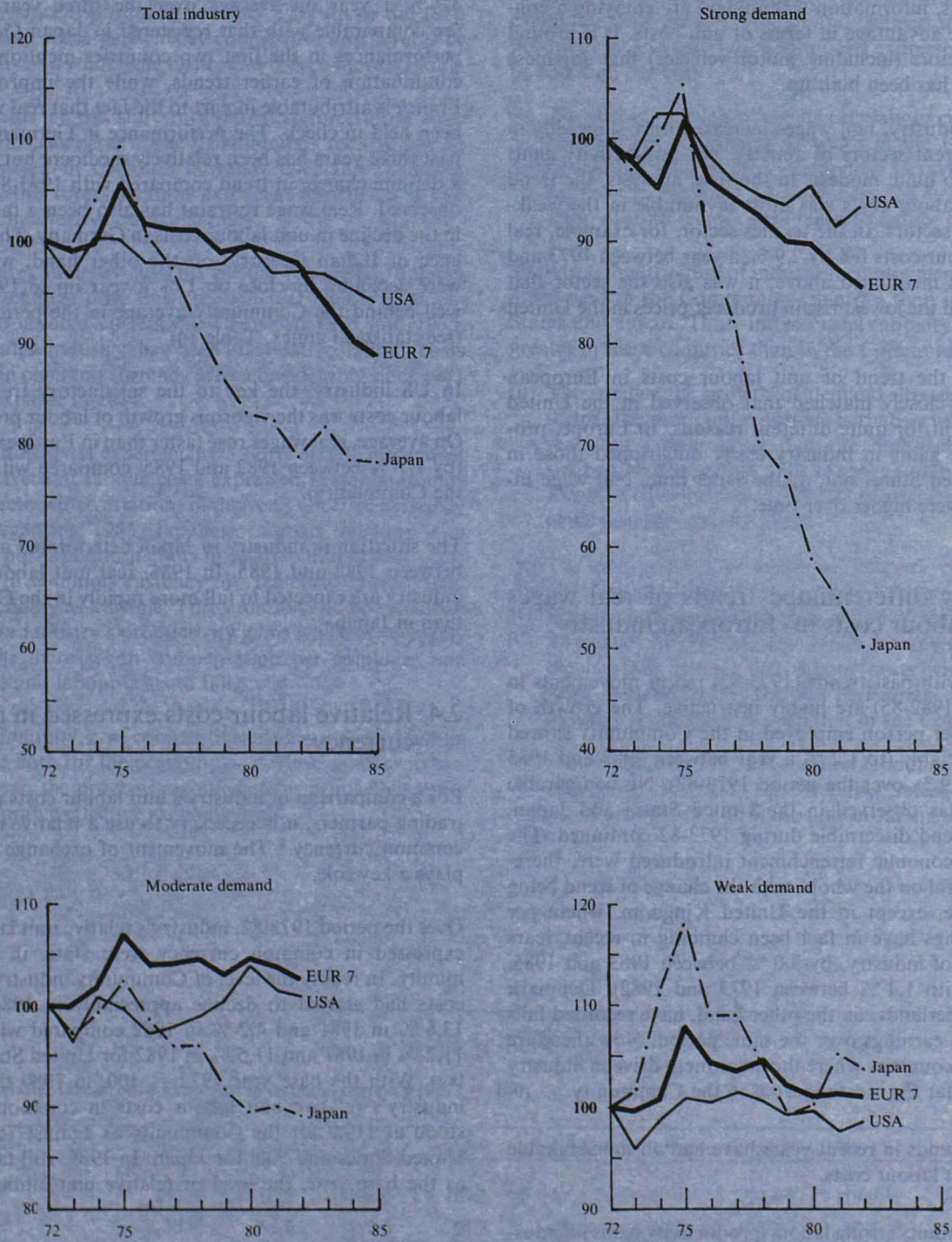
¹ See the earlier chapters in *The New Service Economy*, Gershuny and Miles: Pinter 1983 and the discussion in 'The Growth of Service Employment: A reappraisal', Momigliano and Siniscalco, Banca Nazionale del Lavoro: *Quarterly Review*, No 142 and references cited therein.

- (i) *In the strong-demand sectors*, the decline in unit labour costs was spectacular in Japan, owing to the remarkable increases in the apparent productivity of labour. Real unit labour costs in these sectors recorded slightly larger falls in Europe than in the United States. This was not characteristic of the economy as a whole.
- (ii) *In the moderate-demand sectors*, the differential between productivity gains in industry in Europe and those in Japan was less pronounced than in the strong-demand sectors. Real wages rose sharply in these sectors in Europe (by 3,1 % a year), with the result that unit labour costs increased despite strong productivity gains.
- (iii) *In the weak-demand sectors*, differences in the growth of unit labour costs were minor. It is interesting to note though that costs in these sectors (steel, building materials, metal goods, textiles) rose faster in Japan (0,4 %) than in the Community as a whole (0,1 %).

The trend of real unit labour costs in these three categories of sector thus displayed very specific characteristics in each country.

- (i) With comparable real wage increases throughout industry, but with extremely wide differences in productivity gains between sectors, Japan found itself very comfortably placed in the strong-demand sectors. By contrast, in the weak-demand sectors, movements in unit labour costs in Japanese industry were, on the whole, much the same as those in the other industrialized countries. The

GRAPH 5: Real unit labour costs (1972 = 100)



situation is thus highly asymmetrical. With international demand for their products growing rapidly, the strong-demand sectors (electrical equipment and electronics, chemicals, information technology) are enjoying a considerable advantage in terms of unit costs. It is around these sectors (including motor vehicles) that Japanese industry has been built up.

- (ii) In US industry, real wages increased only sluggishly in the different sectors of activity, but productivity gains were also quite modest. In the final analysis, the trend of unit labour costs was most favourable in the weak-demand sectors. In the textiles sector, for example, real unit labour costs fell by 2,9 % a year between 1973 and 1982. As mentioned above, it was also the sector that registered the lowest rise in producer prices in the United States.
- (iii) Overall, the trend of unit labour costs in European industry closely matched that observed in the United States, but for quite different reasons. In Europe, productivity gains in industry easily outstripped those in the United States but, at the same time, real wage increases were higher over time.

2.3 Highly differentiated trends of real wages and labour costs in European industry.

Compared with past trends (1973-82) recent movements in real wages (1982-85) are highly instructive. The growth of real wages per person employed in the Community slowed down appreciably (to 1,2 % a year between 1983 and 1985 as against 2,9 % over the period 1973-82). No comparable slowdown was observed in the United States and Japan, where the trend discernible during 1973-82 continued. The policies of economic retrenchment introduced were, therefore, successful on the whole, with the change of trend being unmistakable, except in the United Kingdom, where per capita earnings have in fact been climbing in recent years (in the case of industry, by 3,0 % between 1983 and 1985, compared with 1,4 % between 1973 and 1982). Denmark and the Netherlands, on the other hand, have recorded falls in per capita earnings over the same period. Now these are also the two countries where the investment drive in industry has been by far the most vigorous in the Community.

Real wage trends in recent years have had an unmistakable effect on unit labour costs.

In the Community strong labour-productivity gains in industry have, on the whole, combined with moderate real wage increases to bring down industry's real unit labour costs

expressed in national currency. There are, however, spectacular differences from one country to another. The falls recorded in the Netherlands, Denmark and France (some 4,7 % a year on average over the three years 1983-85) are comparable with that registered in Japan (5,2 %). The performances in the first two countries mentioned are the continuation of earlier trends, while the improvement in France is attributable in part to the fact that real wages have been held in check. The performance in Germany over the past three years has been relatively mediocre but, there too, a definite change in trend compared with 1973-82 has been observed. Real wage restraint has also been a major factor in the decline in unit labour costs in Germany. The performance of Italian industry, on the other hand, whose costs were declining by close on 1 % a year up to 1982, lagged well behind the Community average in the period 1983-85 (see statistical annex, Table 14).

In US industry, the key to the satisfactory trend of unit labour costs was the vigorous growth of labour productivity. On average, real wages rose faster than in European industry (by 1,7 % between 1982 and 1985, compared with 1,2 % in the Community).

The situation in industry in Japan deteriorated appreciably between 1982 and 1985. In 1985, real unit labour costs in industry are expected to fall more rapidly in the Community than in Japan.

2.4 Relative labour costs expressed in common currency

For a comparison of industry's unit labour costs as between trading partners, it is necessary to use a relative measure in common currency.¹ The movement of exchange rates then plays a key role.

Over the period 1973-82, industry's relative unit labour costs expressed in common currency were static in the Community. In reality the level of Community industry's relative costs had started to decline appreciably in 1980 (falls of 13,6 % in 1981 and 4,2 % in 1982 compared with rises of 11,2 % in 1981 and 11,5 % in 1982 for United States industry). With the base year 1972 = 100, in 1980 the level of industry's relative unit labour costs in common currency stood at 119,9 for the Community as against 76,1 for the United States and 90,8 for Japan. In 1985, still taking 1972 as the base year, the level of relative unit labour costs in

¹ *Structure and Activity of Industry: Annual Enquiry — Main results 1980/81*, Eurostat, 1984.

common currency for Community industry stood at 85,5 as against 89,6 for Japanese industry and 114,5 for the United States. The change over five years (1980-85) was therefore spectacular since it produced not only a return to the 1980 situation but even a particularly competitive cost level. For the economy as a whole, the turnaround is even more striking.

Developments at the start of 1980, therefore, more than offset the deterioration in the Community's relative labour costs expressed in common currency over the preceding period and this reversal can be explained principally by the movement in effective exchange rates.

United States industry was hit by the rise in the dollar's effective exchange rate. Even though real labour costs expressed in national currency fell between 1983 and 1985, United States industry has seen its relative labour costs expressed in common currency grow considerably since 1981 and then explode in 1984.

Japanese industry is experiencing a fairly erratic movement in its relative unit labour costs expressed in common currency, reflecting the variations in the yen's effective exchange rate. Disregarding 1985, Japanese industry remains in a privileged position and its falls in relative unit labour costs expressed in common currency are regularly greater than for the economy as a whole. This situation can be explained by Japanese industry's productivity gains which appreciably outstrip the increases in compensation per employee and enable real unit labour costs to fall.

In the Community, cost competitiveness is generally tending to improve both for the economy as a whole and for industry. However, the progress recorded stems primarily from a more favourable effective exchange rate.

2.5 Summary

A group of general conclusions can be drawn from an examination of the structure of and changes in wage costs, productivity and real unit labour costs expressed in national or common currency:

- (i) The spread of levels of production labour costs in industrial sectors is appreciably wider in the United States and Japan than in the Community. In certain Member States, the existence of machinery for uniform indexation over all sectors even tends to reduce this spread.

Similarly, the structure of industrial employment is generally more rigid in the Community countries than in the United States and Japan. Thus, intersectoral mobility of labour is greater in these countries than in the Community industry.

- (ii) The smaller the growth of demand directed towards a sector, the more unfavourable is that sector's change in real unit labour costs. On the high-technology and strong-demand sectors, falls in real unit labour costs are recorded over the period 1972-82 in all the industrialized countries, particularly Japan.
- (iii) The performance of Japanese industry conceals very different situations from one sector to another. In the high-technology sectors, as a result of remarkable performances in productivity, Japan is experiencing spectacular falls in real unit labour costs whereas in the weak-demand sectors the cost performance of Japanese industry is comparable with that of the Community.
- (iv) Over the period 1982-85, real unit labour costs improved appreciably in certain EEC Member States, falling to an extent comparable with the falls in Japanese industry. It

Table 8

Industry's relative labour costs expressed in common currency (1972 = 100)

	B	DK	D	F	I	NL	UK	EUR 7	USA	Japan
1980	102,3	101,8	108,0	107,1	87,2	100,6	129,4	119,9	76,1	90,8
1985	80,9	86,5	92,6	91,8	91,1	79,2	108,2	85,5	114,5	89,6

Source: Commission departments.

remains to be seen whether the strong-demand sectors derived most benefit from these developments.

- (v) The Community countries have benefited from the rise in the dollar and the yen against the European currencies after 1980. Valued in common currency, relative labour costs in industry are therefore *a priori* competitive in the Community in 1985, especially in countries such as Denmark and the Netherlands, which have experienced particularly rigorous policies concerning real wages.

3. Investment, capital and substitution of the factors of production

This section discusses changes in industrial investment, focusing special attention on the way in which investment is allocated between sectors. The trends observed are attributable in part to two factors: (i) the return on capital; and (ii) the productivity of capital; the latter being determined to a large extent by a whole range of factors (such as utilization of productive capacities and working time).

The differences discernible in this respect between the three types of sector (strong-demand, moderate-demand and weak-demand) are particularly indicative of the mode of industrial development followed by each of the countries surveyed.

3.1 Compensation of employees and investment ratio

The impact — expressed in terms of national currency — of real unit labour costs goes a long way towards determining changes in total wages and salaries and hence in the share of value-added accounted for by the gross operating surplus. The increase in real labour costs was one of the reasons for the significant contraction observed until the beginning of the 1980s in the resources available to firms for financing investment. The adjusted wage share, that is to say, the compensation of employed and the income of the self-employed expressed as a proportion of value-added at factor cost in industry,¹ rose steadily in the Community throughout the 1970s (see Table 9) from 74,6 % in 1972-73 to 79,5 % in 1981-82, the latter figure matching that recorded for US industry at the time (79,8 %). The wage share though grew much faster in Europe (4,9 percentage points in the nine-year period from 1972-73 to 1981-82) than in the United States (2,7 percentage points over the same period). In spite of the much more pronounced increases in real wages, the figures recorded for the adjusted wage share in Japanese industry (68,3 % in 1981-82) are significantly lower than those for the Community and the United States, although the wage share proper did rise by 9,2 percentage points over nine years.

¹ See for example *Balances of Payments: Geographical Breakdown*, Eurostat, Luxembourg.

Table 9

Adjusted wage share in industry¹

	Period 1972-73		Period 1981-82		Increase between the two periods	
	Industry	Total economy	Industry	Total economy	Industry	Total economy
EUR 7	74,6	74,1	79,5	76,3	+ 4,9	+ 2,2
USA	77,1	73,8	79,8	73,8	+ 2,7	+ 0,0
Japan ²	59,1	73,8	68,3	81,2	+ 9,2	+ 7,4

¹ Compensation of employees and earnings of the self-employed as a proportion of gross value-added at factor cost.

² The difference in Japan between the figures obtained for industry and for the economy as a whole gives rise to a number of questions (income of the self-employed, specific nature of services in Japan, etc.)

Sources: Eurostat, and Commission departments.

Furthermore, the wage share increased more sharply in industry than in the economy as a whole. Such developments explain in part the fall in the investment ratio in industry (gross fixed capital formation expressed as a proportion of value-added in industry) (see Graph 6). Since 1973, the investment ratio in industry has declined steadily in the

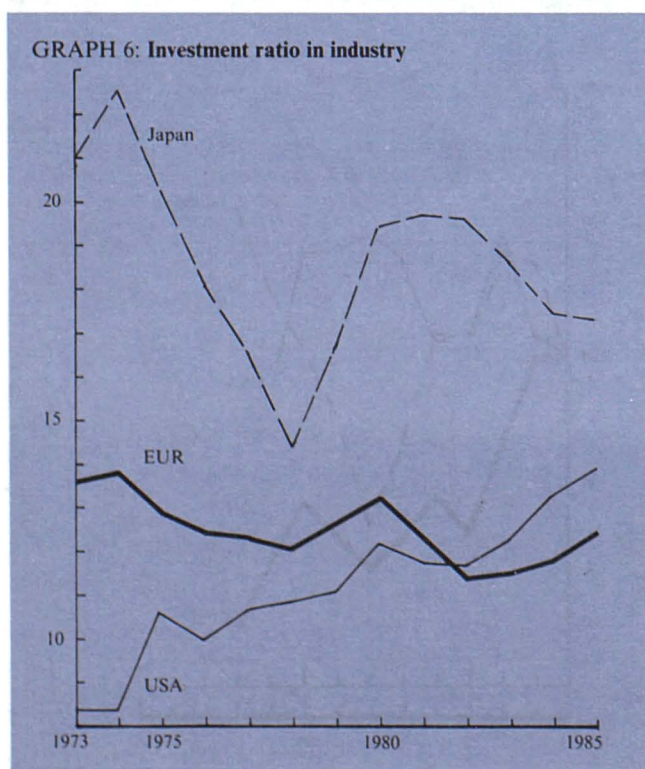
Community but has risen significantly in the United States. Since 1982, the investment ratio in US industry has overtaken that recorded for industry in the Community, while the figure for Japanese industry, after falling back between 1974 and 1978 rose much more rapidly than in its competitors.

Compared with the situation in the other Member States, the investment ratio in industry in the Netherlands and in Denmark (since 1984) has risen sharply, to above the figure recorded in Japan. On the other hand, in 1985, the performance of the large Member States in this respect has lagged behind that of the United States, with none of them managing a return to the situation recorded in 1973 (see statistical annex, Table 16).

In most Member States, the investment ratio showed a less marked decline in industry than in the economy as a whole while the share of value-added accounted for by wages and salaries imposed a greater constraint on industry than on the economy as a whole. The growing burden of labour costs has not, therefore, been fully reflected in the investment rate in industry.

3.2 Investment and capital accumulation in industry

Between 1972 and 1980, real gross fixed capital formation in industry grew by less than 5 % in the Community, 25 % in Japan and by 46 % in the United States, but 1980 was the year in which gross investment in European industry



peaked. In 1985, real gross fixed capital formation in industry is expected to fall short of its 1980 level in the Community but, for that same period, it will probably show a rise in volume terms of 18 % in Japan and in the United States¹ (see Graph 7).

The deterioration in industrial investment in the Community is such that the revival in investment between 1983 and 1985 goes only a little way towards closing the gap separating it from the United States and Japan. The structural analysis in the following paragraph reveals that not all sectors have been affected to the same degree.

Since 1973, but more so since 1979, the capital stock in industry has therefore grown at a much slower rate in Europe than in the United States or Japan.² In the United States, it continued after 1973 to rise at the same sustained rate as prior to the first oil shock, and the investment trend in recent years shows clearly that the capital stock in US industry expanded at a much firmer rate between 1982 and 1985 than was the case in the Community. As a result, the Community is facing serious, deep-seated problems in renewing its productive apparatus (see Graph 8).

Between 1973 and 1979, the gross capital stock in industry in the Community recorded a growth differential of 0,7 % compared to the United States and of 2,9 % compared to Japan. This difference became even more pronounced between 1979 and 1981 (3,2 % less than Japan).

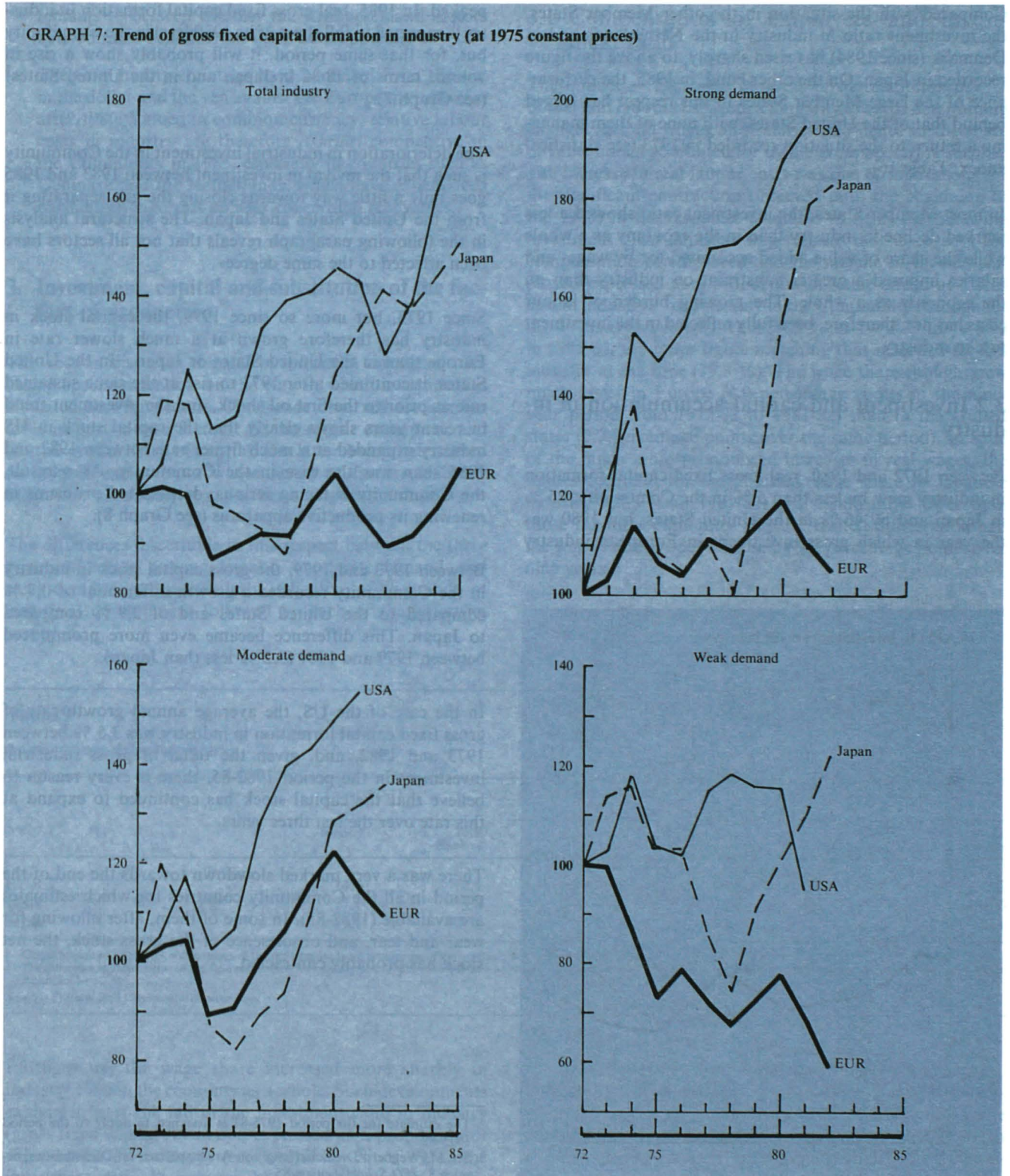
In the case of the US, the average annual growth rate of gross fixed capital formation in industry was 3,5 % between 1973 and 1982, and, given the trend of gross industrial investment in the period 1982-85, there is every reason to believe that the capital stock has continued to expand at this rate over the last three years.

There was a very marked slowdown towards the end of the period in all the Community countries for which estimates are available (1982-85). In some of them, after allowing for wear and tear, and obsolescence of the gross stock, the net stock has probably contracted.

¹ The estimate for the period 1975-81 is assumed to apply to the period 1975-82.

² See M. Wegner, 'Die Schaffung von Arbeitsplätzen im Dienstleistungsbereich 8: IFO Schnelldienst 6/85.

GRAPH 7: Trend of gross fixed capital formation in industry (at 1975 constant prices)



3.3 Capital stock, productivity and rate of return on capital¹

Taking Community industry as a whole, the changes in the gross capital stock are thus giving cause for concern but we still need to identify those sectors in which investments are being made and to examine the reasons (profitability, productivity of capital) for the developments that are taking place.

Strong-demand sectors

In this type of sector (information technology, automated office equipment, electrical equipment, electronics, chemicals, pharmaceuticals), the main conclusions to be drawn from an examination of investment and of the capital stock are the following:

Firms in Europe that invested significantly more than their Japanese and US counterparts in these sectors at the beginning of the 1970s have fallen way behind since the beginning

of the 1980s. In Europe, investment in growth industries has remained flat for close on 15 years. By contrast, US investment has grown steadily over the same period, while after 1978 Japanese industrialists managed to nullify the effects of the first oil shock.

Taking the growth in real gross fixed capital formation, the gap separating the Community from the United States and Japan is still, therefore, much wider in these sectors than in industry as a whole. In terms of annual averages, it was 3.9 percentage points *vis-à-vis* the United States and 3.5 points *vis-à-vis* Japan in the period 1973-82. For the strong-demand sectors with a high technological content, the corresponding figures were 6.6 points and 6 points. And so it is in the most sensitive sectors that the gap has widened most. A sectoral analysis of profitability and productivity indicators may go some way towards explaining this.

In these strong-demand sectors, the gross rate of return² on invested capital calculated at replacement cost fell significantly between 1972-73 and 1981-82, but more so in Europe than in the United States or Japan (see Table 10). Further-

¹ An analysis of the gross rate of return on fixed capital and of the productivity of capital may pose certain problems because of the way in which the capital stock is calculated (see box).

² The gross rate of return is the ratio of the gross operating surplus to the gross stock of fixed capital.

Table 10

The productivity and profitability of the gross capital stock¹ in industry between 1972/73 and 1981/82 (average annual growth rates)

	Strong demand			Moderate demand			Weak demand		
	Gross capital stock	Productivity of gross capital stock	Gross rate of return on capital ²	Gross capital stock	Productivity of gross capital stock	Gross rate of return on capital ²	Gross capital stock	Productivity of gross capital stock	Gross rate of return on capital ²
B ³	4,8	-0,6	-8,6	3,9	-1,6	-8,4	2,2	-1,7	-9,3
D	3,7	-0,4	-6,0	2,9	-1,1	-2,7	1,2	-2,2	-4,9
F	5,3	-0,8	-6,4	4,5	-1,6	-3,6	2,1	-2,1	-4,0
I	3,3	1,6	-1,9	2,5	0,1	-1,8	2,5	0,1	0,4
NL ³	3,5	-0,7	-11,1	3,9	-1,2	-8,0	2,3	-2,4	-10,7
UK	2,8	-2,0	-4,6	2,6	-3,6	-4,5	2,1	-5,7	-10,2
EUR 6 ³	3,9	-0,2	-6,1	3,3	-1,3	-4,2	2,1	-2,0	-3,8
USA ³	4,8	-0,6	-3,8	3,8	-2,4	-7,6	2,1	-1,5	-3,1
Japan ³	6,2	+5,7	-4,8	6,8	-1,2	-4,3	5,3	-2,3	-5,8

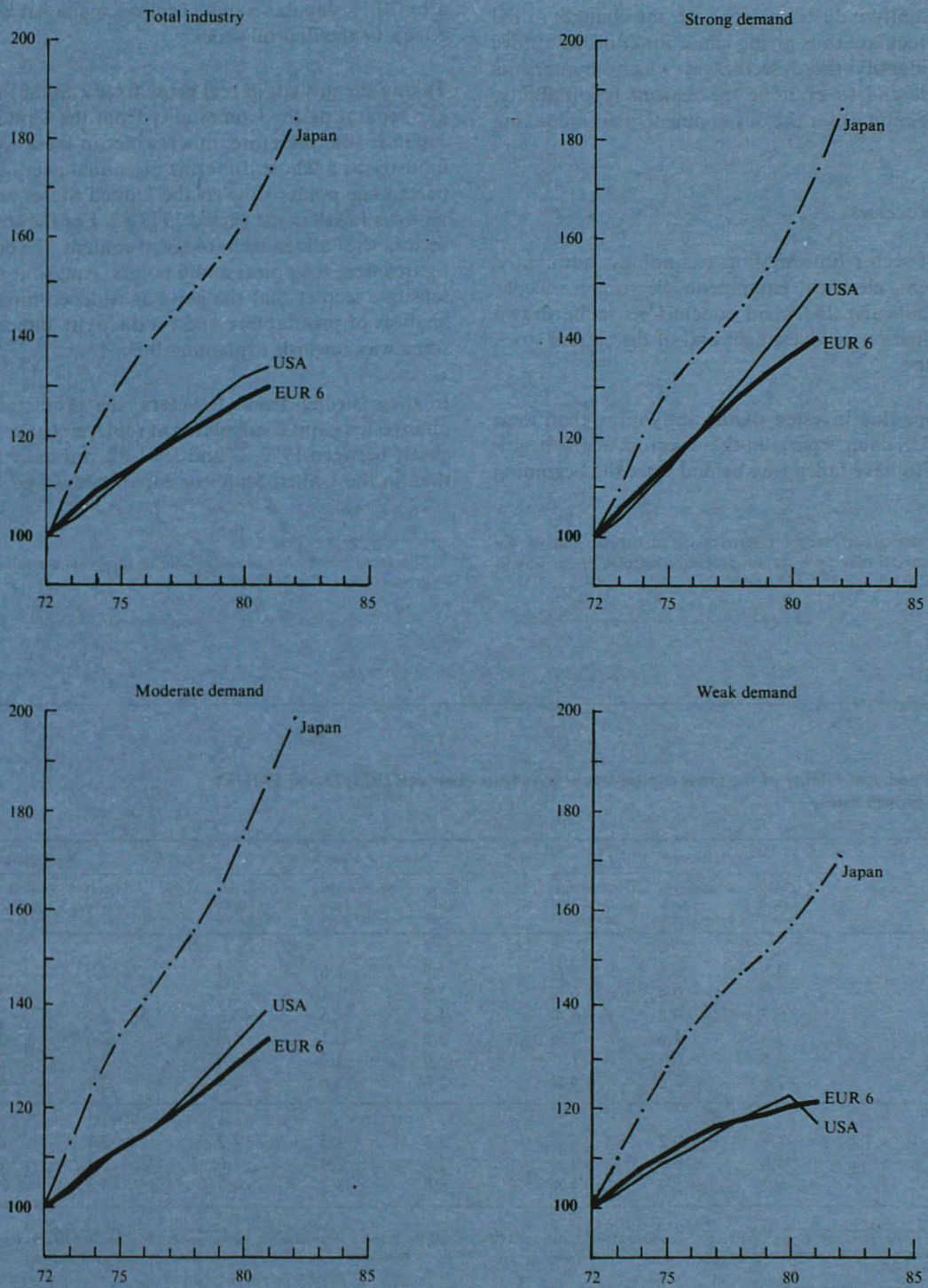
¹ See Note 1, Table 11

² In the case of the United States and Japan, figures on value-added at factor cost are available only for industry value-added at market prices less wages and salaries for EUR 6, the United States and Japan in order to permit comparison.

³ Between 1972-73 and 1980-81

Sources: Eurostat and Commission departments.

GRAPH 8: Gross capital stock in industry (1972 = 100)



more, in the Member States, the decline in profitability in strong-demand sectors was generally more marked than in the other sectors. Even more serious is the fact that, in terms of level, the profitability of invested capital is lower in the strong-demand sectors than in the other types of sector (weak-demand and especially moderate-demand sectors). This is different from the situation in the United States and Japan (see Table 11).

It will therefore be even more difficult in Europe than elsewhere for strong-demand sectors to attract capital, and firms in those sectors will have fewer resources to invest.

Table 11

The relative levels of gross rates of return on the capital stock in the different types of sector (1980-81)¹
(100 = level for total industrial products in the area concerned)

	Strong demand	Moderate demand	Weak demand	Total industrial products
EUR 6	71	126	88	100
USA	114	79	128	100
Japan	108	114	84	100

¹ This table does not give the absolute values for the rate of return on the capital stock since they are not in themselves significant because of the methods of calculation applied in each country. However, a line-by-line comparison, i.e. between the different types of sector in each area, is significant.

Sources: Eurostat and Commission departments.

The depressed level of investment by firms in growth sectors in Europe is also attributable to the fact that firms have difficulty in finding the capital they need to finance their investment plans. Firms vie for capital with general government or with those wishing to invest abroad.¹

A number of analyses have been made at the macroeconomic level of the gap between the rate of return on invested capital and the anticipated real interest rate on long-term government stock. A difficulty arises because of the need to calculate the forward-looking real interest rate. It is, of course, always possible to calculate this rate by deflating the nominal interest rate by the rate of price increases. The results thus obtained for the period 1973-82 show that the forward-looking real interest rate shows an upward tendency whereas the rate of return on invested capital is falling.

¹ See J. Mortensen 'Profitability, relative factor prices and capital/labour substitution in the Community, the United States and Japan, 1960-83', *European Economy*, No 20, July 1984.

Table 12

Working hours in manufacturing industry

	Period 1972-73	Period 1981-82	Decrease %
D index	102,7	98,2	-4,4%
F hours per week	43,8	39,8	-9,1%
UK index	106,0	100,0	-5,7%
USA hours per week	40,7	39,4	-3,2%
Japan monthly index	102,4	99,5	-2,8%

Source: OECD — economic indicators.

After 1981, the real interest rate earned by subscribers to government bonds was probably much higher than the rate of return on capital recorded by firms in three of the four large Community countries (Italy, United Kingdom, France). This situation also discourages the flow of capital to industry, making it even more difficult to finance industrial investments, especially in those sectors where the rate of return on the fixed capital stock is lowest, i.e. the strong-demand sectors in Europe.

Moderate-demand sectors

The situation in these sectors in Europe is not as bad as in the strong-demand sectors.

Taking the period as a whole, investment in these sectors in Europe has experienced economic cycles of the same magnitude as in the United States and Japan (Graph 7), the trend being upwards between the mid-1970s and 1980. In Europe though, these sectors were more badly jolted by the repercussions of the second oil shock than was the case in the United States and Japan, the decline continuing in Europe between 1980 and 1983. The revival in industrial investment in 1984 and 1985 in Europe will possibly not allow these sectors to return to a level of investment comparable to that recorded in 1980.

Between 1973 and 1981, the fixed capital stock in these sectors grew at a slightly faster rate in the United States (averaging 3,8 % a year) than in Europe (3,3 %) but, given the evolution of investment in these sectors between 1982 and 1985, the gap between Europe and the United States must clearly have widened further.

The overall trend in the apparent productivity of capital (value-added per unit of capital stock) was altogether comparable in the Community and Japan. It is in these sectors that Community industry enjoys the highest gross return on

the capital stock. At first sight, therefore, it is not surprising that over the period 1973-81 it is in these sectors too that industrial investment in Europe has held up best.

In the moderate-demand sectors, US industry recorded its worst performances in terms of the gross return on capital and capital productivity. This is due in large measure to the difficulties of the US motor vehicle industry, whose profitability collapsed between 1972-73 and 1981-82. However, the major investment drive undertaken in the industry and the restrictions imposed on imports of Japanese cars produced results, with the industry once again generating profits in the period 1982-85.

In conclusion, the productivity of the capital stock in these sectors (transport equipment, food, industrial machinery, paper), which account for an important part of industrial activity in the Community, was much the same as that in the United States and Japan, and the rate of return on the capital stock fell proportionately less than in the other sectors. Even so, the 1980 recession proved particularly damaging for these sectors in Europe, where, after managing to keep pace in relative terms with the growth recorded in the United States and Japan, investment collapsed between 1980 and 1983.

Weak-demand sectors

In these sectors (textiles, steel, building materials), existing productive capacities are, generally speaking, far in excess of what is needed, bearing in mind the outlook for demand. Already in the midst of extensive restructuring, these sectors were, therefore, harder hit by the recession than the other sectors.

Unlike the other sectors, industrial investment was thus severely dented during the periods of economic recession but did not benefit from any sustained resurgence between 1975 and 1985. These trends though have proved more damaging in Europe than elsewhere. Japan, for example, enjoyed a revival in industrial investment in these sectors after 1978. In Europe, investment in these sectors in 1985 will probably be half the level it was in the early 1970s. There has therefore been a genuine collapse, and after 1978 the fixed capital stock in these sectors remained virtually unchanged. In the United States, the fixed capital stock actually declined in 1981.

Japan was the odd one out, with the weak-demand sectors benefiting from the general efforts made by Japanese industry to boost industrial investment. However, here too, the underlying growth in the gross stock of fixed capital in these sectors faltered relative to the situation in industry as a whole after 1978.

The sound investment performance recorded by Japan in these sectors, which are beset by serious difficulties, cannot, in any event, be put down to a healthy situation with regard to productivity or the rate of return on capital. Indeed, in these sectors, the performance of Japanese industry is deteriorating more extensively than that of European or US industry, and the stagnation that set in in 1978 is expected, therefore, to become more pronounced throughout the 1980s, with Japanese industry investing on an increasingly selective basis in the strong-demand sectors, where, by contrast, it has notched up remarkable performances. Therefore, if anything, the weak-demand sectors have benefited from a general climate that has been conducive to investment. US industry, on the other hand, has been less affected than its competitors in these traditional sectors. It should be pointed out that, in Japan, the rate of return on the capital stock in weak-demand sectors is below the average for industry as a whole, and this inevitably acts as a brake on fresh flows of investment into these sectors.

In this respect, the situation in Europe is a curious one since the weak-demand sectors show an average gross rate of return on the stock of fixed capital that is higher than that in the strong-demand sectors and this does not facilitate an optimum long-term allocation of investment. Examples of fresh investment will therefore be few and far between, and will be found primarily in the strong-demand sectors.

3.4 Capital productivity and utilization of productive capacity

The decline in capital productivity in all the industrialized countries since 1983 is largely due to the low level of productive capacity utilization, itself due to two factors:

- (i) The amount of time during which equipment is used has fallen in line with the reduction in working hours. Recent OECD studies show that in almost all the countries the growth rate of capital in relation to the number of persons employed is distinctly lower than the growth rate of capital related to the number of hours worked.¹
- (ii) The rate of productive capacity utilization, which indicates the relationship between actual output and the potential output that could be achieved if all equipment installed were used, also declined significantly up to 1982, though it increased again thereafter.

¹ OECD, 'Investment, capacity utilization and the rate of growth of productivity', November 1983, DSTI/IND:83.41.

Weekly working hours

Though statistics on working hours are rarely comparable in terms of level, it is possible to get some idea of the trend over the period being looked at here (1972-73/1981-82) in a number of major countries. Table 12 shows that the reduction in working hours in all the European countries for which figures are available (Germany, France and the United Kingdom) was greater than that in the United States and Japan.

These trends partly explain the decline in the effectiveness with which fixed capital has been used in some European countries in particular. In certain production processes, it is not always possible to offset the reduction in working hours by making more intensive use of productive capital, and the reduction in working time thus could mean less effective utilization of the capital stock.

Rate of productive capacity utilization

In most of the industrialized countries, 1973 marked a peak in the rate of productive capacity utilization, one which has not been matched since (see Table 13). The decline in the rate of utilization of the capital stock has of course resulted in an appreciable decrease in capital productivity, when measured as the ratio of value-added to the gross capital stock but there is no undisputed adjustment method that will allow the rate of productive capacity utilization to be taken into account in the trend of capital productivity.

In most of the countries, the decline in the rate of productive capacity utilization has had a clear influence on the decrease in the productivity and profitability of capital. However, the 1982 recovery saw a significant increase in the rate of productive capacity utilization.

3.5 The stock of industrial capital and its performance in each economic area

Each country or economic area is thus characterized by its own fairly marked pattern of development in its industrial investment, largely linked to the performance of its stock of fixed capital (profitability and productivity) in the three types of sectors. This section summarizes the analyses of each of the major countries examined.

- (i) Japanese industry invested very heavily in all the industrial sectors. In the strong-demand sectors, where there have been sharp price reductions as a result of economies of scale, the new capital installed incorporates the latest technology. This new, advanced-technology equipment allowed a substantial improvement to be made in capital productivity (+5,7 % a year on average over the period 1973-82), in contrast to what happened in Europe and the United States (-0,2 % and -0,6 %). In addition to their performance in terms of capital productivity, the strong-demand sectors benefited from a very wide differential between the growth of labour productivity and increases in real wages, which were comparable for all the industrial sectors.

Table 13

Utilization of productive capacity in manufacturing industry

	Level 1972-1973	Level 1981-82	Decrease (%) between the two periods	1983	1984	1985 ¹
B	83,7	74,8	-10,6	75,8	75,9	78,5
D	86,2	78,1	-9,4	76,9	80,2	82,3
F	86,9	82,0	-5,6	81,5	81,9	82,6
I	76,5	72,4	-5,4	70,0	71,9	74,0
NL	84,6	77,6	-8,3	79,5	82,3	83,8
UK	83,8	73,4	-12,4	76,6	82,5	84,6
EUR 6	84,4	77,2	-8,5	77,1	79,1	81,0
USA	85,5	75,3	-11,9	75,2	81,7	81,0

¹ Average for the first half of the year.

Source: Business surveys for the Community countries, main OECD economic indicators for the United States.

By contrast, in the sectors in which demand is weak (steel, textiles, building materials), the average relative increase in unit labour costs in Japanese industry over the period was higher than the Community average. This increase in real wage costs went hand in hand with a significant increase in investment and capital/labour substitution. However, in these weak-demand sectors, the deterioration in the productivity performance of the Japanese industrial capital stock was even greater than that in the same sectors in Europe (-2,3 % on average as against -2,0 % in the Community and -1,5 % in the United States).

- (ii) US industry invested very heavily throughout the period in all sectors. In the weak-demand sectors (steel, textiles, building materials), it benefited from a decline in unit labour costs and would have been in a relatively strong competitive position if the trend of the exchange rate for the dollar had not significantly altered the facts of the situation after 1982. It is indeed in these sectors that inter-country comparison of the performance of the capital stock in terms of productivity and profitability is most favourable for the United States.

By contrast, the performance of US industry in the moderate-demand sectors (motor vehicles in particular) is mediocre. In these sectors, significant increases in real unit labour costs go hand in hand with a very sharp deterioration in the profitability and productivity of capital. However, at the end of the period, the situation was improving.

- (iii) European industry presents fairly wide contrasts in performances between the countries being considered, but overall it is characterized by a low level of investment in industry compared with the United States and Japan.

This situation is partly due to the significant deterioration in the profitability and productivity of the capital stock over the 10 years. However, the decline in the growth rate of investment is also a factor in the poor performances of the capital stock in European industry. This is because the lower growth of investment means a slowdown in the introduction of the most recent capital equipment. This slow growth of capital in Europe in recent years coexists with two other trends: the increase in real wages and the decline in the return on capital. In this situation, faced with the increase in labour costs, firms opt on the one hand for more capital-intensive development or move their production units to new locations, but on the other hand, since their profits are down, they cut their investment spending. European industry's capital stock is therefore probably proportionally older than the capital stock of industry in the United States or Japan, where the rate of new investment has allowed new technologies to be introduced. This situation might partly

explain the sharper deterioration in the apparent productivity of capital in European industry. Clearly, however, this deterioration in productivity is also partly due to the decrease in working hours and in productive capacity utilization rates. It is ultimately in the moderate-demand sectors that the deterioration in European industry's performance is least marked. Industries such as motor vehicles and agri-food have certainly less to fear from comparison with the United States and Japan than do other industrial sectors.

3.6 Total factor productivity

Increased labour productivity (volume of value-added per person employed) reflects a whole series of influences deriving from an increase in a given production factor (capital stock per person employed, energy) or from an improvement in technology, for example. Calculating total factor productivity allows us to assess the proportion of the growth in output that is not attributable to the growth of the various specific means of production considered in the analysis (labour and capital), and the growth of total factor productivity is often regarded as amounting to a rate of technical progress. Factor productivity can also be considered a 'residual' component and may be interpreted in several different ways.¹ The growth rate of labour productivity may be expressed as the sum of the total factor productivity growth rate and of the contribution of capital/labour substitution to the growth of labour productivity (see footnote to Table 14).

Table 14 shows, for industry as a whole, that about 1,4 % of the Community labour productivity gains between 1973 and 1981 (2,8 % a year on average) was due to total factor productivity growth and 1,4 % to increased capital/labour substitution. Capital/labour substitution seems to play a much more important role in industry than in the economy as a whole: 50 % of the increase in productivity in industry is due to the increase in capital/labour substitution, whereas the proportion is only 37 % in the economy as a whole.²

These differences are partly due to the way in which capital is defined in each case. Total factor productivity is calculated at the macroeconomic level on the basis of the total capital stock (including private households and general government) which could give rise to a number of over-hasty conclusions with regard in particular to capital/labour substitution within the really productive part of the economy.

¹ On this subject, see D. Todd, 'Some aspects of industrial productive performance in the European Community: an appraisal', *European Economy*, No 20, July 1984.

² See *European Economy*, No 22, November 1984.

An analysis of Table 14 allows a number of more precise conclusions to be drawn.

In the weak-demand sector, increased labour productivity is essentially due to capital/labour substitution, whereas in the high-technology sectors the contribution of total factor productivity plays a crucial role. The contribution of capital/labour substitution is therefore the key determinant of effective growth in the low-technology sectors. In those sectors, during the period 1973-81, factor substitution was responsible for on average 75 % of the increase in value-added per employee in the Community, the United States and even more so in Japan, with productivity gains achieved through all production factors accounting for the remaining quarter. Recommendations regarding 'less capital-intensive' growth must therefore be advanced with caution, since any growth which is balanced in the long term must depend to a large extent on an increase in the capital/labour ratio.

In the strong-demand and high-technology sectors, the increase in productivity (per head) is largely due to the growth of total factor productivity (65 % in the case of Community industry, 55 % in the case of United States industry and 72 % in the case of Japanese industry). The remarkable performance of Japanese industry in the high-technology

sectors is thus due to the rate of technical progress, averaging 8,1 % a year in the period 1973-82. This means that the Japanese productive apparatus has a very great capacity to incorporate technological innovations and can do so extremely effectively in these sectors.

As a general rule, leaving aside Japan's very particular situation in the strong-demand sectors, capital productivity is declining both in Community industry and in the United States and Japan. Some economists explain the slowdown in Japanese productivity growth by the fact that industry in Japan is approaching the limits of technology in a great many sectors. This explanation does not stand up to a sectoral analysis of productivity trends. It is rather in the most technologically sophisticated sectors that Japanese industry is the most highly competitive in terms of productivity. The slowdown in productivity growth in Japanese industry taken as a whole is simply due to Japanese industry's 'weaknesses' in the low-technology sectors.

In the case of Community industry, the decline in capital productivity has not prevented fairly vigorous growth in labour productivity, resulting as we have seen from capital/labour substitution.

Table 14

Total factor productivity and relative contribution of labour and capital 1973/1981 or 1982 or 1983 (average annual growth rate)

Last year of the period	Industry	Strong demand			Moderate demand			Weak demand					
		Productiv. per pers. employed ¹	Total factor productiv. ²	Weighted change in capit./lab. ratio ^{3,4}	Productiv. per pers. employed ¹	Total factor productiv. ²	Weighted change in capit./lab. ratio ^{3,4}	Productiv. per pers. employed ¹	Total factor productiv. ²	Weighted change in capit./lab. ratio ^{3,4}			
B	1981	4,6	2,6	2,0	4,6	2,6	2,1	3,8	1,9	1,9	4,5	2,5	2,1
D	1982	2,7	1,5	1,3	4,0	2,7	1,3	2,4	1,3	1,1	2,1	0,7	1,4
F	1982	3,4	2,0	1,5	4,2	2,4	1,8	3,5	2,0	1,5	2,2	1,0	1,2
I	1982	2,6	1,7	0,9	4,9	3,8	1,1	1,7	1,0	0,7	2,1	1,2	0,9
NL	1981	3,3	1,5	1,8	2,6	0,9	1,7	3,6	1,8	1,8	3,1	1,2	1,9
UK	1983	1,6	0,1	1,5	3,2	1,7	1,5	1,4	0,3	1,1	1,1	-0,5	1,6
EUR 6	1981	2,8	1,4	1,4	4,0	2,6	1,4	2,5	1,3	1,2	2,0	0,7	1,3
USA	1981	1,1	0,2	0,9	2,2	1,2	1,0	0,3	-0,7	1,0	1,0	0,3	0,7
Japan	1981	6,4	2,9	3,4	11,2	8,1	3,1	5,5	1,8	3,7	3,4	0,1	3,3

NB. Total factor productivity was calculated using a production function with two factors, capital and labour. $V = A(t) f(K, L)$ where V is the level of value-added produced from capital K and labour L . $A(t)$ represents total factor productivity, of which technical progress is an essential component. We have $(v-1) = a + s(k-l)$, where:

¹ $(v-1)$ is the growth rate of labour productivity;

² a is the growth rate of total factor productivity or rate of technical progress;

³ s is the share of profits in value-added at factor cost in the base year;

⁴ $(k-l)$ is the growth rate of capital intensity per head.

Sources: Eurostat and Commission departments.

3.7 Capital/labour substitution

The extent to which capital/labour substitution has contributed to labour productivity growth is quite comparable in the three industrial sectors in each major economic area. The growth of capital intensity per employee was about 4,3 % for the Community, 2,9 % for the United States and 6,3 % for Japan over the period 1973-81 (see Table 21 of the statistical annex).

The fact that the capital/labour substitution process has taken place at a more or less comparable rate throughout all sectors would seem to indicate the importance of macro-economic factors (interest rates, policy on wages) (see Graph 9). Of course, there are differences between sectors: for example, the capital/labour substitution process was faster in the information technology and electrical equipment and electronics industries in most of the countries. Furthermore, the Community average masks significant differences between member countries.

In some countries, the capital/labour substitution process took place at a faster rate in the period 1973-79 (Belgium, the Netherlands and Japan). A slowdown in the substitution process which began in the period 1979-82 continued from 1982 to 1985 notably in Germany and the United Kingdom (see Table 15).

Table 15

Capital intensity per employee in industry
(average annual growth rate)

	1973-79	1979-82	1982-85
B	7,0	5,9 ¹	—
D	4,4	4,2	2,4
F	5,1	4,9	4,8
I	2,7	2,5	3,6
NL	6,0	4,5 ¹	—
UK	4,3	8,1	3,0
EUR 6	4,4	5,0 ¹	—
USA	2,8	4,5 ¹	—
Japan	7,0	4,7	—

¹ 1979-81 instead of 1979-82.

Sources: Eurostat and Commission departments.

The high levels reached by the capital/labour substitution process have in practice meant a sharp fall in industrial employment in the member countries. Community industry was obliged to react to the economic crisis, and to its inability to adjust as rapidly as its competitors to structural changes in demand, by cutting its workforce in a bid to reduce total wages and salaries, especially since real wages were rising more rapidly than labour productivity, at least until the beginning of the 1980s. However, this reduction in total wages and salaries was not accompanied by sufficient industrial investment. A situation has therefore developed in which the increase in capital intensity per employee is very high in Community industry because of a very rapid decrease in labour input, while investment remains insufficient compared with that in the United States and Japan.

3.8 Summary

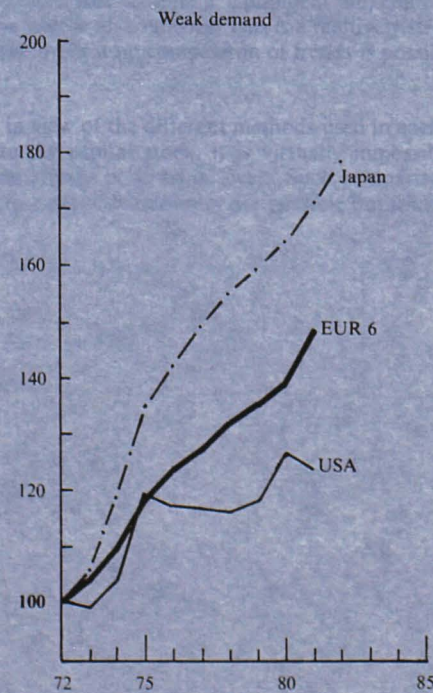
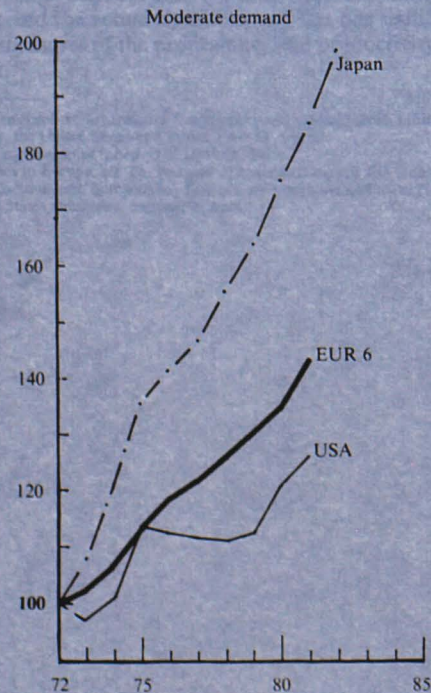
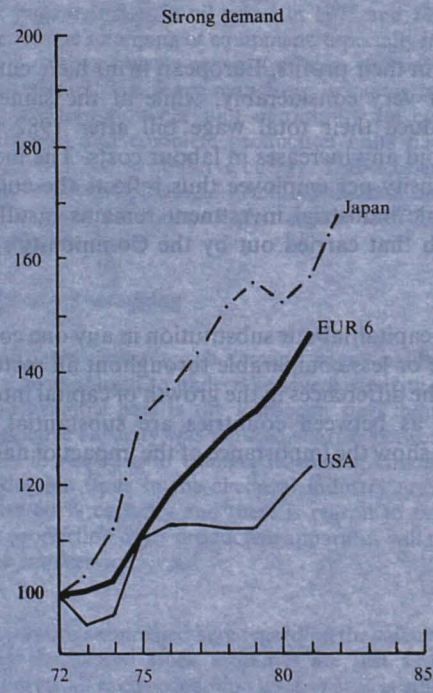
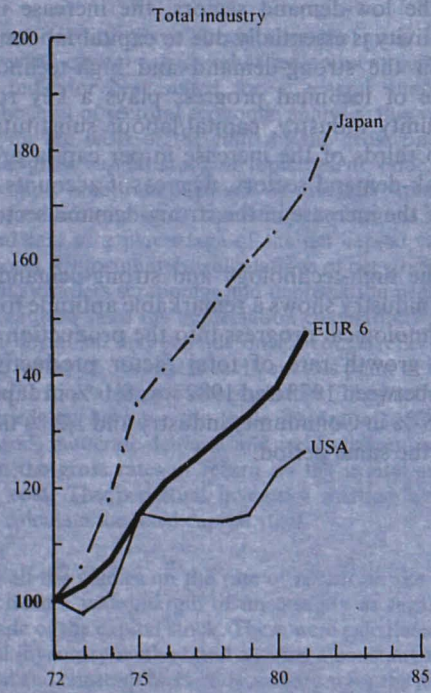
1. The level of industrial investment in Europe is not only insufficient to regenerate the fabric of industry, but the sectoral allocation of the investment carried out also raises problems. There is a danger that the strong-demand sectors which are the mainstays of growth might not have sufficient productive capacity to meet the growth in internal and external demand. It is in these sectors in particular that import penetration levels increased most sharply in the period 1973-82. Thus, in the period 1973-82, the average annual volume growth in GFCF for Community industry as a whole was 4,5 percentage points below that in the United States and 3,7 points less than in Japan. In the same period, taking the strong-demand sectors, the gap in the average annual growth of GFCF was 6,6 points compared with US industry and 6 percentage points compared with Japanese industry. The leeway which has built up is therefore considerable, and this gradual long-term slowdown in industrial investment must have had far-reaching effects on the fixed capital stock which has emerged as obsolescent from the crisis.

2. This weakness in industrial investment in Europe is partly due to the deterioration in the profitability of the capital stock. In the high-technology sectors in particular, the deterioration in the gross rate of return on capital is greater in Community industry than in the United States and Japan. Hence the difficulty in raising the necessary finance, particularly since the interest rates which subscribers can obtain on government bonds is higher than the rate of return on capital in firms in many European countries.

3. The appreciable deterioration in gross profitability is also due to:

- (i) the decline in capital productivity, which is itself partly due to a reduction in working hours and in the utilization of productive capacity;

GRAPH 9: Capital intensity per employee in industry (1972 = 100)



- (ii) the increase in real wages (between 1973 and 1982 in particular), which has been significantly greater in the Community countries than in the United States and Japan.

Given the fall in their profits, European firms have cut back on investment very considerably, while at the same time seeking to reduce their total wage bill after 1982 in an attempt to avoid any increases in labour costs. The increase in capital intensity per employee thus reflects the cut-back in labour, while industrial investment remains insufficient compared with that carried out by the Community's partners.

4. The pace of capital/labour substitution in any one country has been more or less comparable throughout all sectors of industry, but the differences in the growth of capital intensity per employee as between countries are substantial. This would seem to show the importance of the impact of national

macroeconomic factors (interest rates, wage policy) on the capital/labour substitution process.

5. In the low-demand sectors, the increase in per capita productivity is essentially due to capital/labour substitution, while in the strong-demand and high-technology sectors the rate of technical progress plays a key role. Thus, in Community industry, capital/labour substitution accounts for two thirds of the increase in per capita productivity in the weak-demand sectors, whereas it accounts for only one third of the increase in the strong-demand sectors.

6. In the high-technology and strong-demand sectors, Japanese industry shows a remarkable aptitude for incorporating technological progress into the production process. The annual growth rate of total factor productivity in these sectors between 1973 and 1982 was 8,1 % in Japan compared with 2,6 % in Community industry and 1,2 % in US industry during the same period.

Problems in using the capital stock for the purposes of economic analysis

Studies on profitability¹ have shown that the gross rate of return on invested capital calculated at replacement cost is the profitability indicator best suited for a general analysis of growth. At the level of sectoral economic analysis, this variable is estimated on the basis of the ratio of the gross operating surplus to the gross capital stock at replacement value. Some studies² also apply a net rate of return on invested capital; this is obtained by calculating the net operating surplus (less interest payments and tax) as a percentage of the net capital stock at replacement cost. Unfortunately, calculations of net stock based on the capital stock less scrappings and depreciation need to be treated with caution since the depreciation calculations rely on mathematical formulae that provide only a rough reflection of the economic reality of obsolescence. From this point of view, it is 'reasonable' to look at the gross capital stock. The profitability analyses carried out here for the three sectoral classifications (strong-demand, moderate-demand and weak-demand sectors) are based on the gross rates of return on the capital stock at replacement cost. The perpetual inventory method has been used here to calculate the fixed capital stock.³

At any rate, all the studies on the rate of return on the capital stock suffer from a wide margin of uncertainty as regards the estimates made of the capital stock. These were calculated using the perpetual inventory method and assume a constant average life for capital and constant rates of depreciation for the different stock components. Since the first oil shock, relative prices in industry have fluctuated markedly and a whole series of factors have created distortions between the theoretical estimates of the capital stock and the actual situation, and this has significantly affected the measures of the profitability and productivity of the capital stock.

¹ See J. Mortensen 'Profitability, relative factor prices and capital/labour substitution in the Community, the United States and Japan, 1960-83', op. cit.

² T.P. Hill, *Profits and rates of return*, OECD, Paris, 1979.

³ For the countries in Europe, see Th. Paccoud, 'Le stock de capital fixe industriel dans les pays de la Communauté Européenne', *Études de comptabilité nationale*, No 2, 1983. For the United States and Japan, national sources.

(i) Higher energy and raw material prices

The huge increases in oil prices in 1973 and 1979 have led to extensive scrapping of equipment, especially in the sectors heavily dependent on energy (refining, petrochemicals, cement, paper). The sharp reductions in energy intensity (energy consumption per unit of output) are evidence that equipment and complete production units have been replaced in a bid to conserve energy. This accelerated scrapping, which the perpetual inventory method does not take into account, produces a higher capital coefficient than the calculations made.

(ii) Accelerated scrapping

Confronted with sluggish demand, many industrial sectors have been obliged to undertake severe capacity cutbacks. A good example here is the European steel industry, where productive capacity was reduced sharply between 1973 and 1982, in response to changes in market conditions. Some production units in the chemical industry are working at under 60 % capacity and there is reason to believe that a fair proportion of its productive apparatus will never be put back into service.

The reservations expressed here regarding the calculations incorporating the capital stock estimates are just as pertinent at sectoral level as macroeconomic level. Yet it is still possible to compare long-term trends in the countries surveyed provided, of course, it is assumed that, overall, the phenomena discussed above (accelerated scrapping, equipment life) come into play in the same way in all countries. This is a relatively strong hypothesis but without it no comparison of trends is possible.

Lastly, in view of the different methods used in each country to calculate the capital stock, it is virtually impossible to make any comparisons in terms of levels. Such comparisons between sectors in a particular country are possible but tricky.

Chapter 3: The development of market services in the European Community, the United States and Japan

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Chapter III: The development of market services in the European Community, the United States and Japan

The purpose of this chapter is to examine the development of market service activities in the European Community, the United States and Japan over the decade to the early 1980s, and to throw some light on why these developments have taken place. The term 'Market services' is used to cover all services which can be the object of purchases and sales on the market, and which are produced by a unit whose resources are mainly derived from the sale of its output. In the present study the term 'Total market services' covers a wide range of activities for example; wholesale and retail trade; lodging and catering services; all transport and communication services; the services of insurance credit and financial institutions and personal and business services of various kinds (including the renting of dwellings). Market services excludes collective services produced by general government.

The chapter is divided into two parts:

- (i) the first describes the changes in economic structure that have occurred in the 10 years to 1982 and points to the increased importance of market service activities in the Community and the United States;
- (ii) the second examines the pattern of demand for market services and shows that, in recent years, in the Community, the growing demand for services by industry has been the major influence on the growth of market services output.

The analysis in the first part of the text together with the supporting tables and graphs are based upon the data given in the Eurostat sectoral data bank.¹ This bank provides data on value-added employment, investment and related variables for the Member States of the European Community, according to the concepts and definitions of the European System of Accounts (ESA) and the associated nomenclature of economic activities, the NACE.²

Comparable data have also been prepared by the Directorate-General for Economic and Financial Affairs, for the United States and Japan.

It should be stressed that there are gaps in the data. For certain countries and certain activity branches observations are missing for a number of years. These gaps make it difficult to construct figures for the Community of 10

countries. Consequently the figures given in the text, tables and graph, for the Community, are for the grouping of six countries - Belgium, FR of Germany, France, Italy, the Netherlands and the United Kingdom. This group of countries accounted for more than 95 % of Community GDP in 1982.

1. A comparison of changes in the structure of the European, American and Japanese economies

This first section summarizes the more general changes in structure that have occurred, in the above three economies, over the past decade. In particular attention is focused upon changes in:

- (i) the structure and the growth of value-added;
- (ii) employment and labour productivity;
- (iii) the structure of gross fixed investment;
- (iv) earnings and gross profits.

In the tables data are given for market services and, for comparative purposes, for manufacturing industry and the whole economy.³

1.1 Increased contribution of market services to total gross value-added

There are a number of ways in which the contribution of market services to total economic activity can be measured. One is to consider the proportion of total gross value-added (TGVA), measured at current prices, generated by market services and to estimate how this proportion has changed. The available data point to a significant increase in the value-added contribution by market services, in the Community, the United States and Japan over the period 1970-72 to 1980-82⁴ with the movement for the Community more marked than elsewhere. Over the same period the contribution of manufacturing activities fell. The details are set down in Table 1. In interpreting this table it should be kept in mind that data are only given for the activities market services, manufacturing and for the totals of each of the economies in question. Thus in 1980-82 market services

¹ For a detailed description of this bank see 'Studies of national accounts No 4 Structural Data Base, Tables by branch 1960-1981', Eurostat, 1984.

² For a more detailed description of the concepts and definitions used see annex.

³ The other four activity branches included in the totals in the tables, but for which data are not given separately are 'Agriculture, forestry and fishing', 'Fuel and power', 'Building and construction' and 'Non-market services'.

⁴ To improve the estimation of changes in longer-term trends the figures are based on three-year moving averages.

Table 1

Contributions of market services and manufacturing to total gross value-added, 1970-72 and 1980-82¹
Based on data at current prices

(%)

	Market services			Manufacturing industry			Total		
	1970-72	Change	1980-82	1970-72	Change	1980-82	1970-72	Change	1980-82
D	35,8	5,6	41,4	35,6	- 5,6	30,0	100	—	100
F	40,4	4,5	44,9	28,5	- 2,6	25,9	100	—	100
I	38,8	0,7	39,5	28,3	0,5	28,8	100	—	100
UK	40,1	0,9	41,0	31,2	- 6,4	24,8	100	—	100
EUR 6 ²	38,8	3,5	42,3	31,0	- 4,3	26,7	100	—	100
USA	47,1	2,5	49,6	24,7	- 3,5	21,2	100	—	100
Japan	43,5	2,7	46,2	32,8	- 4,6	28,2	100	—	100

¹ To improve the estimation of changes in longer-term trends, the figures in Tables 1 to 9 are based on three year moving averages.

² Unless otherwise stated throughout this note the term EUR 6 covers the grouping Germany (D) + France (F) + Italy (I) + United Kingdom (UK) + Belgium (B) + the Netherlands (NL).

Source: Eurostat and Commission services.

Table 2

Contributions of market services and manufacturing to total gross value-added, 1970-72 and 1980-82
Based on data at current prices

(%)

	Market services			Manufacturing industry			Total		
	1970-72	Change	1980-82	1970-72	Change	1980-82	1970-72	Change	1980-82
D	36,7	4,6	41,3	33,9	- 2,9	31,0	100	—	100
F	40,1	4,7	44,8	27,5	- 0,3	27,2	100	—	100
I	37,8	2,0	39,8	29,3	2,3	31,6	100	—	100
UK	40,0	2,8	42,8	29,8	- 5,9	23,9	100	—	100
EUR 6	38,8	3,7	42,5	29,7	- 1,6	28,1	100	—	100
USA	45,5	4,2	49,7	23,7	- 0,9	22,8	100	—	100
Japan	44,0	- 0,3	43,7	28,7	5,7	34,4	100	—	100

Source: Eurostat and Commission services.

and manufacturing contributed 42,3 % and 26,7 % respectively to the total gross value-added of the Community. The remainder was accounted for by the other four main activity groups: Agriculture (3,3 %); Fuel and power (6,4 %); Building and construction (6,8 %) and Non-market services (14,5 %).

The figures for the Community are the result of somewhat different changes in each of the four large Community countries. Thus in Germany, the increase in the contribution of services, and the decrease for manufacturing, were very marked indeed. On the other hand, in Italy, the current price data point to a modest increase in the contribution to the total by both market services and manufacturing. In the United Kingdom the increase in the contribution of market services was modest and the fall for manufacturing substantial, although the latter movement was offset by the increased contribution of energy producing activities.

The data in Table 1 combine the effect of both volume and price movements. Changes in the contribution of each activity to total gross value-added based on constant price data (see Table 2) provide a measure of volume movements alone.

The data show that, both for the Community and the United States, the increases in the contribution of market services to TGVA were greater, and the declines in the contribution of manufacturing were less marked when measured at constant prices, than when measured at current prices; this contrast is also to be seen in the data for each of the large Community countries except Italy (see Table 2). Indeed, in Italy, the manufacturing contribution, when measured at constant prices, rose significantly. It is possible to explain these differing structural changes by noting that in Europe and the United States, over the period 1970-72 to 1980-82, the prices of manufactured goods increased more slowly than prices in market services and indeed in the economy as a whole, so that any analysis based on current price data exaggerates the decline of manufacturing activities.

However, it is for Japan that the contrast between the current and the constant price data is particularly marked. Thus although, when measured at current prices, the changes in the structure of value-added in Japan were similar to those observed elsewhere, a completely different picture emerges from the constant price data, with the contribution of market services falling (albeit modestly) and that of manufacturing increasing substantially.

These movements reflect the small increase in the price index of gross value-added for Japanese manufacturing industry of 3,0 %, at an average annual rate, over the 10 years to 1980-82, compared to an average annual increase of 7,2 %

Table 3

Average annual growth rates of gross value-added at market prices over two five-year periods: (i) 1969-71 to 1974-76; (ii) 1975-77 to 1980-82

Based on data at constant 1975 prices

	Market services		Manufacturing industry		Total	
	(i)	(ii)	(i)	(ii)	(i)	(ii)
	(%)					
D	3,7	4,0	2,1	1,4	2,9	2,7
F	5,4	3,7	4,9	2,0	4,3	2,6
I	4,0	3,4	4,2	3,8	3,3	2,9
UK	2,7	2,0	1,0	-2,2	2,4	0,8
EUR 6	4,0	3,4	3,0	1,4	3,3	2,3
USA	3,8	3,8	2,7	2,1	2,8	2,9
Japan	5,0 ¹	5,1	5,3 ¹	8,8	4,7 ¹	5,6

¹ 1970-72 to 1975-77.

Source: Eurostat and Commission services.

for market services. The difference between these two growth rates, 4,2 percentage points, was much greater in Japan than in the Community or the United States.¹

Thus, when measured at constant prices, the shift in the structures of value-added in the Community and the United States towards market services was not repeated in Japan; instead manufacturing industry increased its strength and importance.

The difference in volume movements are also illustrated by the growth rates of gross value-added as measured at constant prices. These are summarized in Table 3. In the period to the early 1970s, in the four major European countries, the average annual growth rate of value-added in manufacturing was greater than that for the economy as a whole, whereas that for market services was broadly the same or somewhat less. However there is now evidence to suggest that the roles of market services and manufacturing have been reversed. Thus for the Community, over the period to 1980-82, the value-added growth rate for market services moved further and further ahead of both that for manufacturing, and for the economy as a whole. This experience was shared by each

¹ The average annual growth rates of the price indexes of gross value-added for market services and manufacturing, between 1970-72 and 1980-82, were 9,5 % and 8,5 % for the Community, and 6,8 % and 6,0 % for the United States.

of the major Community countries with the exception of Italy where gross value-added in manufacturing continued to grow significantly faster than the total economy.

The change in the structure of growth in the United States was marked by a significant weakening in the growth of value-added in manufacturing whereas growth in market services remained close to 4 % per annum at an annual average rate.

In contrast in Japan the gross value-added of market services, in the five-year period to 1980-82, grew more slowly than the economy as a whole and growth in manufacturing accelerated sharply.

1.2 A marked change in the pattern of employment, and in Europe, an improved labour productivity performance in market services

In the European Community, the change in the pattern of value-added growth noted in Table 3 was associated with a change in the structure of employment with the numbers employed in market services increasing by 15 % (see Table 4). This increase more than offset the decline in manufacturing, and overall employment increased slightly.

In the United States the steady growth of market services was associated with a massive increase in market service employment (33 %). There was also a very small increase in manufacturing activity employment. When account is taken of the increase in employment in other activity branches

(largely non-market services), then total employment increased by more than 21 % over the 10 years to 1980-82.

In Japan, the vigorous growth of manufacturing gave rise to little change in manufacturing employment, whereas market service employment advanced strongly.

In the Community, the United States and Japan the growth of gross value-added per head (labour productivity) in manufacturing industry has, in the past, been greater than that for the economy as a whole, whereas that for market services has been less. The explanation normally advanced for this difference is that the labour intensive and personal nature of many service activities makes it difficult for them to enjoy the kind of productivity gains that are normal in manufacturing industry. Indeed many economic commentators have argued that this difference of labour productivity growth rates, reflecting the nature of the production processes for goods and services, accounts for the shift in the structure of employment towards market services that has occurred in Europe and the United States

This pattern of labour productivity growth rates appears to have persisted until the mid-1970s. However, there is some evidence that, in the major European countries (with the exception of Italy), the Community as a whole, and the United States, the gap between labour productivity growth rates in services and manufacturing has narrowed and that labour productivity growth in services has moved close to that for the total economy (see Table 5). This convergence of labour productivity growth rates occurred at the same time as an underlying slowdown in labour productivity growth.

Table 4

Employment: 1970-72 and 1980-82

	Market services			Manufacturing industry			Total		
	1970-72	Change	1980-82	1970-72	Change	1980-82	1970-72	Change	1980-82
D	8 262	702	8 964	9 561	-1 347	8 214	26 647	-692	25 955
F	6 974	1 538	8 512	5 577	-429	5 148	20 942	575	21 517
I	5 728	1 336	7 064	5 464	95	5 559	19 728	1 190	20 918
UK	9 171	1 053	10 224	8 098	-1 691	6 407	24 426	117	24 543
EUR 6	33 529	5 123	38 652	31 019	-3 889	27 130	100 180	1 199	101 379
USA	37 642	12 282	49 924	19 178	948	20 126	87 117	18 855	105 972
Japan	21 249	5 512	26 761	14 512	-26	14 486	54 630	5 490	60 120

Source: Eurostat and Commission services.

Table 5

Average annual growth rates of labour productivity over two five-year periods: (i) 1969-71 to 1974-76; (ii) 1975-77 to 1980-82

	Market services		Manufacturing industry		Total	
	(i)	(ii)	(i)	(ii)	(i)	(ii)
D	2,9	2,8	3,9	2,2	3,3	2,4
F	3,1	1,8	4,1	3,8	3,8	2,5
I	2,3	0,9	3,5	4,0	3,0	2,2
UK	1,7	0,9	2,8	0,6	2,2	0,9
EUR 6	2,6	1,8	3,9	2,9	3,2	2,1
USA	1,2 ¹	0,6	2,8 ¹	1,2	1,2 ¹	0,6
Japan	2,6 ¹	2,7	5,8 ¹	8,4	3,8 ¹	4,4

¹ 1970-72 to 1975-77

Source: Eurostat and Commission services

As the massive increase in employment would suggest labour productivity growth rates also declined in the United States; indeed they were virtually negligible both in the service activity branch and for the economy as a whole in the five years to 1980-82.

In Japan, labour productivity growth for the whole economy remained substantially greater than in the United States or Europe. At the individual branch level however, productivity performances differed markedly. Gross value-added per head in market services grew at a steady 2,6 % per annum whereas in manufacturing activities a much more impressive average annual rate of 8,4 % was recorded towards the end of the period considered.

The results for the four large Community countries given in Table 5 may be grouped into two categories. In Germany and the United Kingdom labour productivity growth in market services moved ahead of that for manufacturing activities and, in the former case, ahead of that for the economy as a whole. On the other hand, in France and Italy labour productivity growth in manufacturing maintained an impressive strength, whereas that for market services weakened considerably.

By comparing Tables 3 and 5 it will be seen that, in the European Community and for the economy as a whole, output and labour productivity growth were broadly the same. However, in the United States although output growth remained relatively vigorous, productivity growth was virtually zero, particularly in the five years to 1982, so pointing to a substantial increase in employment.

In Japan the growth of output remained perhaps 1 % ahead of output per head so ensuring that the impressive productivity gains were not reflected in a loss in employment. For a more detailed examination of these points see box 'Changes in employment and hours worked in certain market service activities'.

1.3 Market service activities increase their contribution to total investment

For the European Community the changes in the patterns of growth of gross value-added, productivity and employment, already noted, have been associated with changes in the structure of gross fixed investment and, as a consequence, of the capital stock. Thus over the decade to 1980-82, there was an increase in the proportion of the volume of total gross fixed investment undertaken in market services, offset by a decrease in the proportion undertaken by manufacturing (see Table 6). When allowance is made for investment in dwellings, the increase in the total accounted for by other market service activities is even more marked. Thus following national accounts conventions investment in dwellings is included in the activity market services and Table 6 presents these data separately so as to reveal the changes in the contribution of market services in the narrower sense. (However, it should be noted that a significant part, although by no means all, of the structural shift which this disaggregation reveals, will be the result of investment undertaken by various financial institutions, for the purpose of leasing to companies engaged in manufacturing activities.) This change in structure, and its implications for the capital stock, when combined with the movements in labour productivity already noted, suggests there may have been a process of both capital widening and of capital deepening in the service activities. Such a process could well lead to a change in the nature of service producing activities with perhaps less emphasis on labour intensive personal services and more on capital intensive services provided to enterprises (see box on 'Changes in employment and hours worked').

These developments are broadly reflected in each of the four large Community countries (see Table 6) with their magnitude being particularly substantial in Germany and the United Kingdom, countries where, however, in recent years investment by enterprises classified to market services, for the purposes of leasing to manufacturing undertakings, has been important (see box 'The leasing of investment goods' for more details).

In the United States over the 10 years to 1980-82, there was no clear shift in the structures of investment away from

Table 6**Contributions of market services and manufacturing to total gross fixed investment
Based on data at constant 1975 prices**

	Market services			Manufacturing industry			Total		
	1970-72	Change	1980-82	1970-72	Change	1980-82	1970-72	Change	1980-82
	(%)								
D	50,8	5,1	55,9	20,8	-3,4	17,4	100	—	100
F	53,6	2,0	55,6	19,0	-2,2	16,8	100	—	100
I	52,5	2,8	55,3	22,1	-3,3	18,8	100	—	100
UK	50,6	4,8	55,4	18,1	-4,6	13,5	100	—	100
EUR 6	51,5	3,9	55,4	20,0	-2,9	17,1 ²	100	—	100
USA	50,4	5,0	55,4 ³	11,5	2,3	13,8 ³	100	—	100
Japan	44,0	-2,6	41,4	22,7	-3,5	19,2	100	—	100

¹ The contributions in % for Market services excluding investment in dwellings are:

	1970-72	Change	1980-82
D	23,0	7,5	30,5
F	23,8	4,7	28,5 ²
I	23,8	7,0	30,8
UK	16,0	10,7	26,7
EUR 6	24,3	6,1	30,4 ²
USA	24,8	13,3	38,1 ³
Japan	22,1	0,9	23,2

² 1979-81.

³ 1978-80.

Source: Eurostat and Commission services.

manufacturing and towards market services even when allowance is made for the decline in investment in dwellings.

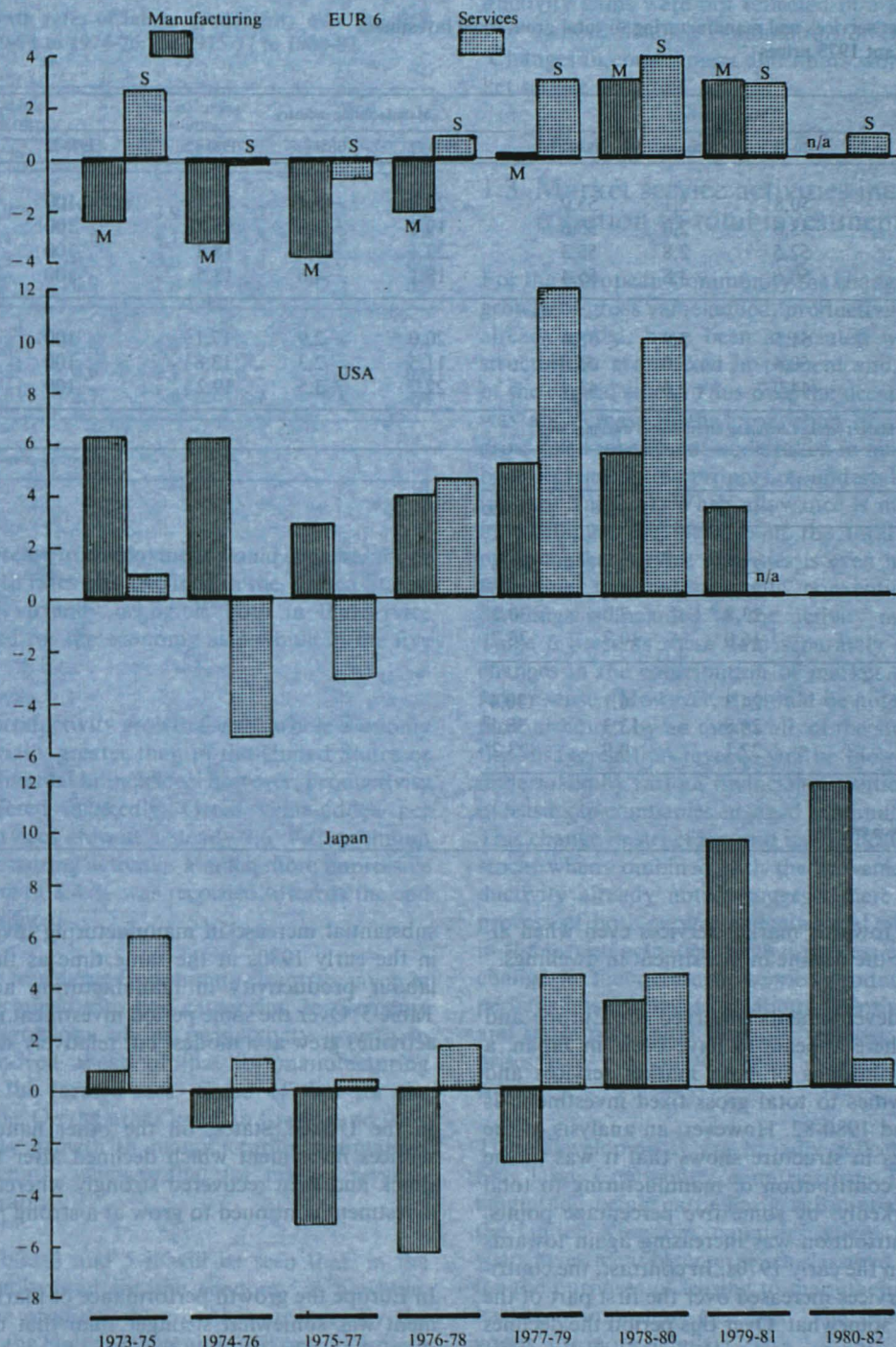
In contrast to the developments observed for Europe and the United States there appears to have been, in Japan, a decline in the contributions of both market services and manufacturing activities to total gross fixed investment as between 1970-72 and 1980-82. However, an analysis of the year-to-year changes in structure shows that it was in the mid-1970s that the contribution of manufacturing to total investment fell markedly, by some five percentage points. By 1980-82 the contribution was increasing again towards the levels recorded in the early 1970s. In contrast, the contribution of market services increased over the first part of the decade but then fell somewhat. Over this period the declines in the contributions of manufacturing and market services were offset by increases from the activities energy and non-market services. These developments are also illustrated by the growth rates of investment set down in Graph 1. The

substantial increase in manufacturing investment occurred in the early 1980s at the same time as the acceleration in labour productivity in manufacturing activities given in Table 5. Over the same period investment in market services activities grew at a modest but relatively steady pace.

In the United States, on the other hand, it was market services investment which declined after the first oil price shock and then recovered strongly whereas manufacturing investment continued to grow at a strong pace.

In Europe the growth performance of market service investment was somewhat stronger than that of manufacturing throughout the 10-year period, a development which confirms the change in structure already noted. However, both rates of growth remained modest compared to those reached in the United States and Japan.

GRAPH 1: Growth rates of gross fixed investment



Average annual growth rates over three year period (%), vertical scale.
 Growth rates calculated using three-year moving averages of annual data. The end period for calculation of the growth rates is given on the horizontal scale.
 Source: Eurostat.

1.4 The growth of earnings per head in market services below that observed for manufacturing

It can be argued that the increase in market service employment and, in Europe, the change in the structure of fixed investment, should be reflected in the development of earnings per head, and indeed this does appear to be the case. Thus in the Community, the United States and Japan, through the 10 years to 1980-82, earnings per head advanced more slowly in market services activities than in manufacturing, although there is evidence that the growth rates were converging towards the end of the period (see Table 7). From these data, it is not possible to judge whether the slower growth in earnings in market services reflects actual differences in hourly earnings paid (for example) or the greater number of part time workers employed by undertakings such as shops and hotels.

The figures for the Community broadly follow developments in each of the large Member States with the exception of Italy where the growth of earnings per head in services had, by 1982, moved ahead of that for manufacturing.

Similar results are obtained if growth rates for real earnings per head are calculated. Thus in Europe and the United States the growth of earnings per head in real terms, in market services, remained significantly below that recorded for manufacturing activities (see Table 8) and this lends support to the view that the growth of employment in market services has been partly in response to favourable developments in labour costs.

1.5 In the European Community and the United States, the share of profits in value develops more favourably in market services

The movements in gross value-added, employment and earnings per head already noted, imply a change in the structure of gross profits. Indeed there have been marked changes in the share of gross profits in gross value-added in market services and manufacturing as between 1970-72 and 1980-82. Figures of relative gross profit shares for these two sectors are set down in Table 9. Thus, in 1970-72 the gross profit share in market services in the Community as a whole, was a substantial 49.4 % above that for manufacturing activities. However, a marked increase took place between 1970-72 and 1980-82 with the relative market services gross profit share becoming 66.4 % greater than that for manufacturing.

This increase in relative gross profit shares also occurred in the four large member countries with the exception of Italy.

A similar increase also occurred in the United States with the relative gross profit share in market services rising to almost 100 % above the level for manufacturing.

Table 7

Average annual growth rates of the compensation of employees per head over two five-year periods: (i) 1969-71 to 1974-76; (ii) 1975-77 to 1980-82

	(%)					
	Market services		Manufacturing industry		Total	
	(i)	(ii)	(i)	(ii)	(i)	(ii)
D	9,7 ¹	5,8	10,2 ¹	7,1	9,7 ¹	6,0
F	12,5 ¹	12,9	14,4 ¹	14,1	14,8 ¹	13,6
I	17,4	18,4	18,7	18,0	17,6	19,5
UK	16,3 ¹	14,4	18,7 ¹	14,3	17,7 ¹	14,0
EUR 6	13,4 ¹	11,0	14,7 ¹	11,5	14,1 ¹	11,1
USA	7,4	8,6	8,0	9,1	7,5	8,5
Japan	16,7 ¹	7,2	17,0 ¹	7,4	17,2 ¹	7,2

¹ 1970-72 to 1975-77.

Source: Eurostat and Commission services.

Table 8

Average annual growth rates of earnings per head deflated by the price index for gross value-added, over two five-year periods: (i) 1970-72 to 1975-77; (ii) 1975-77 to 1980-82

	(%)					
	Market services		Manufacturing industry		Total	
	(i)	(ii)	(i)	(ii)	(i)	(ii)
D	3,8	1,6	4,2	2,9	3,8	1,9
F	2,6	2,0	4,4	3,0	4,7	2,6
I	4,0	0,8	5,1	0,5	4,0	1,8
UK	1,6	0,4	3,7	0,4	2,9	0,1
EUR 6	3,2	1,6	4,4	2,1	3,8	1,8
USA	0,7	0,6	1,6	1,1	0,9	0,5
Japan	6,0	3,5	6,2	3,7	6,4	3,5

Source: Eurostat and Commission services.

The picture for Japan is very different. Indeed, the relative gross profit share for market services fell by five percentage points over the decade to 1980-82.

It can be argued that these changes in the structure of gross profits provide some explanation for the changes in the structure of fixed investment already noted.

1.6 Summary of the points made

For the European Community:

- (i) The contribution of market services to total gross value-added has increased markedly, broadly offsetting the fall in the contribution of manufacturing activities. At the same time, the pattern of growth of value-added has changed, with market services growing faster than the economy as a whole, and manufacturing activities more slowly.
- (ii) There has been a marked increase in employment in services, and a decline in employment in manufacturing. Moreover, labour productivity growth in market services has been catching up with labour productivity in the economy as a whole. The growth of earnings per head in market services both in nominal and real terms has, however, remained below that observed for manufacturing.
- (iii) There is evidence of a shift in the structure of both investment and gross profits towards services although, to a limited extent, these changes will reflect leasing activities.

The developments in each of the four large Member States have been somewhat different with both France and perhaps more notably Italy recording more vigorous performances by manufacturing activities, whereas in Germany and the UK the growth of manufacturing was much weaker than market services and the decline in employment more marked.

For the United States:

- (i) There has been a marked increase in the contribution of market services to total output, largely offsetting the fall in the contribution of manufacturing. At the time market services output growth has remained vigorous, with the growth of manufacturing much weaker.
- (ii) The change in the pattern of output growth has been associated with a massive increase in market service employment and a small increase in manufacturing employment. Labour productivity growth has been negligible in market services, and in the economy as a whole.

For Japan:

- (i) The growth rate of manufacturing output has remained, in recent years, well above that for the economy as a whole, and for all the other branches, including market services.
- (ii) Nonetheless, because output per head in market services has advanced slowly, employment has expanded markedly.

2. The changing pattern of demand for market services

Part 1 sets down the broad changes in economic structure that have occurred in the European Community, the United States and Japan during the decade to 1980-82. In both Europe and the United States the contribution of market services to economic activity has increased; this is the case whether gross value-added, employment, investment or gross profits are considered. The purpose of this second part is to examine the factors on the demand side that have been associated with this change in structure. To begin with, the well-documented link between rising living standards and increases in employment in market services is confirmed.

Table 9

Share of gross profits in gross value-added in market services relative to manufacturing activities¹

Indices: Manufacturing = 100

	Market services		Manufacturing industry	
	1970-72	1980-82	1970-72	1980-82
D	149.4	210.9	100	100
F	163.1	187.9	100	100
I	132.4	92.9	100	100
UK	131.4	137.7	100	100
EUR 6	143.2	166.4	100	100
USA	164.6	191.7	100	100
Japan	90.7	85.7	100	100

¹ For the purposes of this table, gross profits equal gross value-added at market prices less compensation of employees corrected for the self-employed. The share of gross profits in gross value-added equals gross profits divided by gross value-added. The relative gross profits share for market services equals the gross profits share for market services divided by the gross profit share for manufacturing.

Source: Eurostat and Commission services.

This link is usually attributed to a change in the pattern of private consumption following a rise in living standards.¹ This explanation is then examined and, in the case of the European countries, is shown to be inadequate. Rather the growth of market services owes much to the growth of the consumption of services by industry, as intermediate inputs into production. This finding throws light on the structural changes that have taken place within industry and services, and has implications for the debate on so-called de-industrialization.

To confirm the link between living standards and market service employment a start is made by plotting the proportion of the employed labour force engaged in market services (see Table 4), against the level of real income per head, measured as gross domestic product, at constant 1975 prices and exchange rates, per head. This is done for the Community, the United States and Japan in Graph 2.

The graph shows that, for each of these economies, the link between the proportion of the employed labour force engaged in market services, and real income per head, is close. Moreover, in each case, the proportion of the labour force engaged in market services appears to be related to the level of constant price GDP per head, by a function that has the property of approaching an asymptotic value or limit as GDP/head increases. A possible asymptote is indicated on the graph. A number of functions exhibit this property. One particular relationship is based upon the exponential function:

$$L_s/L = a \cdot \exp(b/Y) \quad [1]$$

$$\text{or } \log(L_s/L) = \log a + b/Y$$

where L_s denotes the number employed in market services, L total employment, and Y , GDP/head.

This equation has the property that as Y increases so b/Y approaches zero and L_s/L the value a .

Equation [1] also has the property that the elasticity of changes in the employment proportion (L_s/L) with respect to changes in income (Y) is a declining function of the variable Y , implying that the rate of change of the structure of employment generally slows down as GDP per head increases. This property would appear, *prima facie*, to be plausible and so Equation [1] has been tested against the data.

¹ See the earlier chapters in *The New Service Economy*, Gershuny and Miles; Pinter 1983 and the discussion in 'The Growth of Service Employment: A reappraisal', Momigliano and Siniscalco, Banca Nazionale del Lavoro: *Quarterly Review*, No 142 and references cited therein.

To permit ordinary-least squares techniques to be used the hypothesis has been tested in its logarithmic form

$$\log(L_s/L)_t = \log a + \frac{b}{y_t} + e_t \quad [2]$$

where t denotes the time period of the observations and the error term e_t is normally distributed $N(0, S^2)$.

The least squares estimates of Equation [2] using data for the Community of Six, the United States and Japan are set out in Table 10.

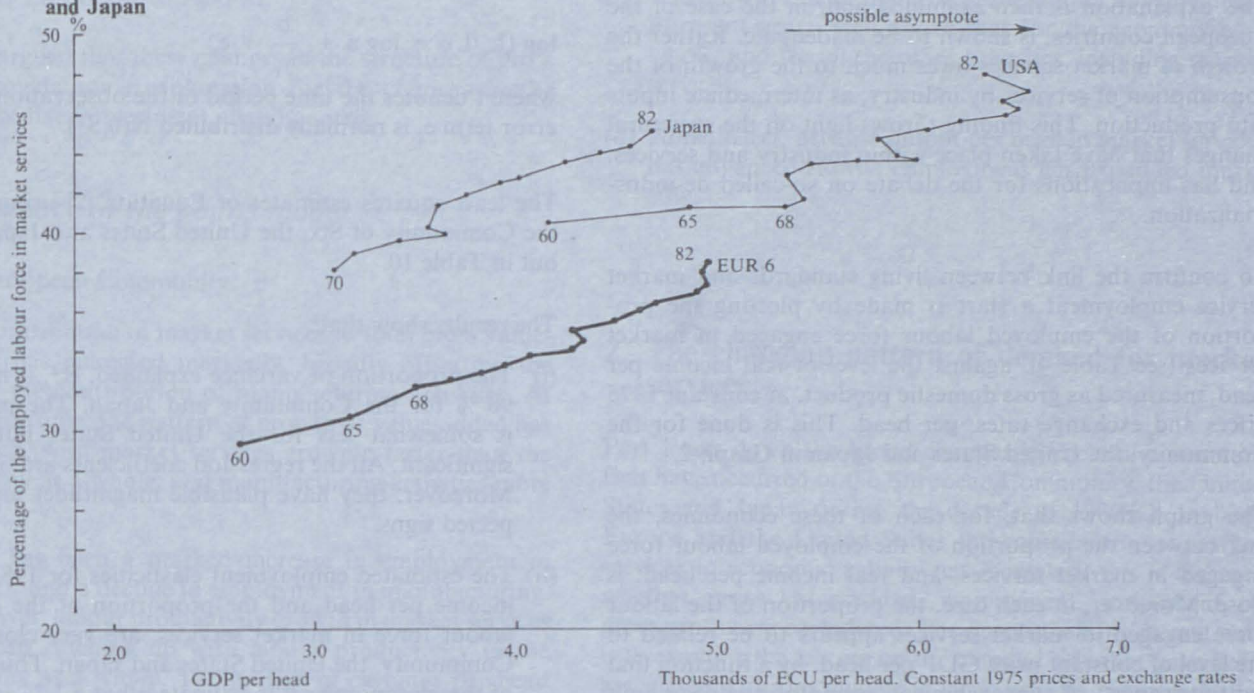
The results show that:

- (i) The proportion of variance explained, R^2 , is more than 90 % for the Community and Japan. The proportion is somewhat less for the United States but remains significant. All the regression coefficients are significant. Moreover, they have plausible magnitudes and the expected signs.
- (ii) The estimated employment elasticities for 1982, linking income per head and the proportion of the employed labour force in market services, are very close for the Community, the United States and Japan. Thus for each of these economies it is estimated that a 1 % increase in GDP per head will lead to 0.3 % increase in the proportion of the total labour force employed in market services.

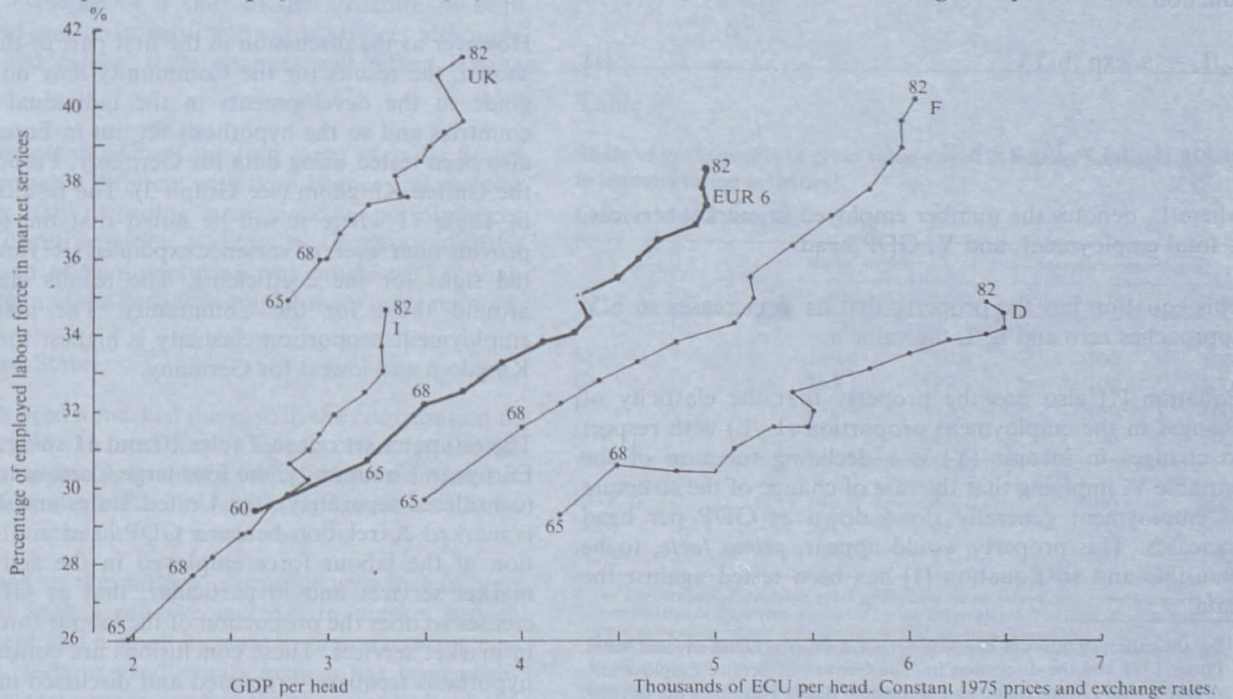
However as the discussion in the first part of this study has shown, the results for the Community may not be a good guide to the developments in the individual community countries and so the hypothesis set out in Equation [2] has also been tested using data for Germany, France, Italy and the United Kingdom (see Graph 3). The results are set out in Table 11 where it will be noted that the results again provide high levels of variance explained (R^2) and the expected signs for the coefficients. The results cluster closely around those for the Community. The market service employment proportion elasticity is highest for the United Kingdom and lowest for Germany.

The estimates set out in Tables 10 and 11 show that for the European Community, the four large Community countries (considered separately), the United States and Japan, there is marked correlation between GDP/head and the proportion of the labour force employed in the activity branch market services and in particular, that as GDP/head increases so does the proportion of the labour force employed in market services. These conclusions are consistent with a hypothesis frequently repeated and discussed in the economic literature and often called the theory of stages of econo-

GRAPH 2: GDP per head and the proportion of the employed labour force in market services: European Community, the United States and Japan



GRAPH 3: GDP per head and the proportion of the employed labour force in market services: the four large European countries



mic growth.¹ This theory attempts to explain the relative growth of market services by suggesting that, as an economy grows and income per head increases, so the demand for services increases faster than the demand for consumption goods in general. As a consequence, the structure of consumption changes and this change, combined with the assumed tendency for the production of services to exhibit a slower rate of labour productivity growth than the production of goods, leads to the shift in the pattern of employment already noted.

To complete the picture it is also usually asserted that the consumption of services is price inelastic, so that the more rapid rise in the price of services, due to slow labour productivity growth, has only a negligible effect on the volume of services consumed.

Clearly it is important to establish whether these speculations are consistent with the developments observed in the

European Community, the United States and Japan. Indeed the link between increases in GDP/head and the rise in the numbers employed in market services may be explained by the following developments on the demand side.

As already noted, there are changes in the pattern of private consumption, with market services accounting for an increasing proportion of total household expenditure; however, it may also be necessary to take into account:

- (i) increased purchases of services as intermediate inputs into production activities; and
- (ii) an increasing contribution from international trade in services.

2.1 For the European Community and the United States no clear shift in the pattern of private consumption towards market services

In this subsection, the point of departure will be 1975 — a year for which consistent input-output tables are available

¹ See the earlier chapters in *The New Service Economy*, Gershuny and Miles; Pinter 1983 and the discussion in 'The Growth of Service Employment: A reappraisal', Momigliano and Siniscalco, Banca Nazionale del Lavoro: *Quarterly Review*, No 142 and references cited therein.

Table 10

Employment in market services and GDP per head
Least squares estimates of Equation [2] for the Community, the United States and Japan

EUR 6	$\log (L_s/L) =$	3.9143	—	1 510.6	•	$\frac{1}{\text{GDP/head}}$:	$R^2 = 0.9028$
		(0.0319)		(128.0)				
USA	$\log (L_s/L) =$	4.1262	—	1 948.5	•	$\frac{1}{\text{GDP/head}}$:	$R^2 = 0.7634$
		(0.0494)		(280.1)				
Japan	$\log (L_s/L) =$	4.1268	—	1 512.1	•	$\frac{1}{\text{GDP/head}}$:	$R^2 = 0.9545$
		(0.0281)		(104.4)				

Estimated elasticities of market services employment proportion (L_s/L) with respect to GDP head in 1982 are:

EUR 6 0.305,

USA 0.307,

Japan 0.323.

The least squares regressions for EUR 6 and the USA are based on data for 1960, 1965, 1968 to 1982, for Japan on data from 1970 to 1981.

Source: Eurostat and Commission services.

Table 11

Employment in market services and GDP per head
Least squares estimates of Equation [2] for the four large Community countries

D	$\log(L_s/L) =$	3,7631	—	1 560,0	•	$\frac{1}{\text{GDP/head}}$:	$R^2 = 0,8732$
		(0,0295)		(153,5)				
F	$\log(L_s/L) =$	3,9665	—	1 991,8	•	$\frac{1}{\text{GDP/head}}$:	$R^2 = 0,9024$
		(0,0363)		(169,1)				
I	$\log(L_s/L) =$	3,7819	—	1 003,8	•	$\frac{1}{\text{GDP/head}}$:	$R^2 = 0,8802$
		(0,0371)		(95,6)				
UK	$\log(L_s/L) =$	4,0816	—	1 405,7	•	$\frac{1}{\text{GDP/head}}$:	$R^2 = 0,8477$
		(0,0477)		153,8				

Estimated elasticities of market services employment proportion (L_s/L) with respect to GDP/head in 1982 are:

D 0,243;
 F 0,331;
 I 0,305;
 UK 0,385.

The least square regressions are based upon data for the years 1960, 1965 and 1968-82.

Source: Eurostat.

Table 12

The allocation of the output of market service activities in the European Community. Data for 1975

NACE activity number	Proportion of output allocated to:				Total
	Intermediate consumption by industry ¹	Intermediate consumption by services ¹	Final demand by households ²	Exports of households ²	
57 Wholesale and retail trade	17,5	7,7	64,7	10,1	100,0
59 Lodging and catering services	6,7	11,0	82,3	—	100,0
61 Inland transport ³	34,2	24,9	31,4	9,5	100,0
63 Maritime and air transport ³	19,9	27,9	9,0	43,2	100,0
67 Communication	19,1	45,8	31,8	3,1	100,0
69 Services of credit and insurance institutions	7,5	73,7	16,2	2,6	100,0
73 Renting	2,1	9,7	87,3	0,9	100,0
79 Other services ⁴	22,8	29,1	44,0	4,1	100,0
Total excluding 57 and 73 ⁵	19,2	34,5	38,7	7,6	100,0
Total excluding 73	18,7	26,6	46,4	8,3	100,0
Grand total	16,8	24,6	51,1	7,5	100,0

¹ In this table the term industry covers all activities except market and non-market services; the term services covers the sum of market and non-market services.

² Final demand by households includes expenditures by foreign tourists in the Community.

³ Including the relevant parts of activity 65: Auxiliary transport services.

⁴ The sum of NACE activity branches 71 + 75 + 77 + 79.

⁵ For the reasons justifying this grouping of activities see annex.

Source: Eurostat; input-output table for 1975 for EUR 8 (EUR 6 as defined plus Ireland plus Denmark).

for each of the Member States of the Community and the Community itself. These data make it possible to calculate for the Community, the allocation of market service output, in 1975, to various categories of intermediate and final demand. The output allocation proportions are given in Table 12. According to the grouping of activities considered, final demand by households, in 1975, accounted for between one third and one half of market service output. Tables 13 and 14 show how the proportion of private consumption devoted to market services has changed over the period 1975 to 1982 for the European Community, the four large Community countries, the United States and Japan. Amongst the market services included in this analysis are those that might be considered, *a priori*, to have a high income elasticity such as expenditure on entertainment and cultural services, and expenditure in restaurants, cafes and hotels, etc.

The figures in Table 13 show that the proportion of final consumption expenditure devoted to the purchase of such market services, in the European countries, increased somewhat over this seven-year period. For the Community aggregate, the average annual rate of growth of market services expenditure at current prices was almost 1 % ahead of that for total expenditures.

Such a result is consistent with the hypothesis that the income elasticity of market services is greater than unity. However, it is important to disentangle the effect of prices from the calculation. Thus the change in the proportion of expenditure on market services at current prices, noted above, could well reflect price movements and low price elasticities, in addition to movements associated with income. Figures based on data at the constant prices are set out in Table 14.

These show that for the countries of the Community, but with the exception of the United Kingdom, the income elasticity of market services is only just greater than unity. Thus, over the seven years to 1982, expenditure on market services in the Community increased at an annual average rate of about 2,4 % whereas the volume of total consumption increased at an average annual rate of 2,3 %.

For the United States, the volume growth of private consumption of market services at 3,0 % has been slightly less than that for consumption as a whole (3,1 %).

For Japan, the data used to calculate the growth of the consumption of market services have a much broader coverage than those for the European countries, or the United

Table 13 Final consumption of households: market services (% based on data at current prices)

Final consumption of households: market services (% based on data at current prices)

	Average annual growth rates 1975-82		Proportion of total consumption devoted to market services	
	Consumption of market services ¹	Total final consumption ²	1975	1982
D ³	7,1	6,4	10,7	11,2
F ³	15,3	14,5	13,7	14,5
I ³	20,2	20,4	15,2	15,0
UK ³	14,6	14,3	22,7	23,2
EUR 6 ³	12,7	11,6	14,6	15,6
USA ⁴	11,0	10,8	27,7	28,1
Japan ⁵	11,4	9,0	43,9	51,0

¹ Final consumption codes 46 + 63 + 64 + 72 + 83 + 84 + 85 + 86 (see ESA 1979).

² Exact ESA terminology: Final consumption of households on the economic territory.

³ Source: Eurostat.

⁴ Source: OECD; for the United States the definition of market services retained is close to that used for the European countries.

⁵ Source: OECD; for Japan the definition of market services retained covers all expenditure on services.

Table 14 Final consumption of households: market services (% based on data at 1975 prices)

Final consumption of households: market services (% based on data at 1975 prices)

	Average annual growth rates 1975-82		Proportion of total consumption devoted to market services	
	Consumption of market services ¹	Total final consumption ²	1975	1982
D ³	3,4	1,9	10,7	11,8
F ³	3,1	3,4	13,7	13,8
I ³	2,5	2,7	15,2	14,5
UK ³	0,6	1,4	22,7	21,6
EUR 6 ³	2,4	2,3	14,6	14,7
USA ⁴	3,0	3,1	27,7	27,6
Japan ⁵	4,5	3,4	43,9	47,2

¹ Final consumption codes 46 + 63 + 64 + 72 + 83 + 84 + 85 + 86 (see ESA 1979).

² Exact ESA terminology: Final consumption of households on the economic territory.

³ Source: Eurostat and Commission services.

⁴ Source: OECD; for the United States the definition of market services retained is close to that used for the European countries.

⁵ Source: OECD; for Japan the definition of market services retained covers all expenditure on services.

States, and so considerable caution is needed in interpreting the figures. Nonetheless these do point to a growth of market services expenditure, at constant prices, significantly greater than that for total consumption (4,5 % compared to 3,4 %).

Thus, for the European Community and the United States, the more vigorous growth in the output of market services (relative to manufacturing and the economy as a whole) in more recent years (see Table 3) and the associated rise in employment does not appear to have been entirely due to a marked shift in the pattern of private consumption in favour of private market services. Other components of demand for market services must have been growing vigorously.

2.2 In the European Community, vigorous growth in the volume of consumption of services by industry

As Table 12 shows, for the Community, a significant proportion of the output of most service activities is purchased as intermediate consumption by industrial and service activities; indeed for many service activities 50 % of the output is accounted for by intermediate demand.

The Europe-wide annual enquiry¹ into the structure and activity of industry, provides a measure of the changes in the purchases of services by manufacturing industry. Table 15 sets down the relevant rates and growth rates for the period 1975-81 (the latter being the most recent year for which suitable data have been published). It will be observed that the growth of the value of purchases of both industrial and non-industrial services is in excess of the growth of the value of production, often substantially so. Consequently, for the Community, the ratio of the total purchases of services to production increased from 13,1 % to 14,9 % over the six years to 1981.

Estimates of the associated rates of price increase over the same period are given in Table 16. On combining the value data in Table 15 with the price data in Table 16, it is possible to conclude that, for the Community as a whole, over the period 1975 to 1981 the average annual growth rate for the volume of services purchased by industry was in the range 3,5-4 % per annum. This compares to an average annual growth of manufacturing gross value-added in real terms for the same six-year period of 2,4 % per annum.

¹ *Structure and Activity of Industry: Annual Enquiry — Main results 1980/81*, Eurostat, 1984.

Table 15

The purchases of services by industry
Data at current prices

	Average annual growth rates 1975-81			Ratio of expenditure on services to the value of production			
	Purchases of industrial services ²	Purchases of non-industrial services ²	Value of production	Industrial services		Non-industrial services	
				1975	1981	1975	1981
EUR ¹	13,7	12,7	10,6	3,2	3,8	9,9	11,1
D	10,4	7,8	6,9	3,1	3,8	9,7	10,3
F	—	14,1	13,1	—	6,3	15,1	15,9
I	25,3	22,3	20,1	3,9	5,1	9,8	11,0
UK	10,4	18,3	10,3	2,9	2,9	4,8	7,2

¹ The figures given for the European Community cover those countries for which data are available. For industrial services the figures cover Germany + Italy + the United Kingdom + Denmark. For non-industrial services: Germany + France + Italy + United Kingdom.

² Purchases of industrial services cover repair and maintenance work, installation work and technical studies, etc. Purchases of non-industrial services cover the cost of legal and financial services, communication transport, travel and other business services and the cost of leasing investment goods.

Sources: Eurostat and Commission services.

The difference between these two figures suggests that the growth of market service output and employment, in the Community, owes much to the rapid volume growth of the consumption of services by industry.

Unfortunately it has not been possible to construct comparable figures for the United States. For Japan certain estimates have been made. However these lead to different conclusions from those made for the Community namely that in Japan:

- (i) significantly more than 60 % of the output of market services, in 1975, was accounted for by final demand;
- (ii) the growth of the volume of services purchased by industry was broadly the same as the growth of market services output.

2.3 Exports and imports of market services have grown rapidly

The balance-of-payments data published by Eurostat¹ provide figures for total trade in services analysed both by type of service imported/exported and by geographical area of origin/destination. Using Eurostat's nomenclature and terminology, an aggregate 'International trade in market services' may be derived as the sum of the items set down in Table 17.

These items when added together equal the total 'Services' given in Eurostat balance-of-payments tables, less 'Investment income' and 'Government transactions not indicated elsewhere', neither of which have been considered market services in the strict sense.

Table 17 summarizes the developments in international trade in services for the period 1975 to 1982, based upon data using this framework. Figures for total merchandise trade are provided for comparison.

An examination of these data suggests that developments in international trade in services may have been somewhat unfavourable for growth and employment in the Community. Thus for Community trade with non-Community countries, market service debits (or imports) measured at current prices grew slightly faster than credits (or exports) over the seven year period to 1982, reducing the surplus on market service trade from 1 500 million ECU to virtually zero.

¹ See for example *Balances of Payments: Geographical Breakdown*, Eurostat, Luxembourg.

However, it is possible to estimate the growth of exports and imports of services in volume terms; these estimates are set out in Table 18. The figures suggest that the difference between the growth in the volume of service exports, and the growth in the volume of service imports, is even more marked than the differences for values. This further reinforces the idea that the overall export performance of services has been somewhat weaker than that for imports. Nonetheless, exports of market services still exhibited an impressive average annual volume growth of almost 7 %.

Table 16

The purchases of services by industry: value, price and implied volume movements.
Average annual growth rates 1975-81

	Value	Output prices ²	Implied volume
(%)			
Purchase of services by industry ¹			
EUR	13.0	9.1	3.6
D	8.5	3.9	4.4
F	15.0 ³	10.8	3.8
I	23.2	17.3	5.0
UK	16.0	13.3	2.4
Memorandum item:			
Industrial production			
EUR 6	10.6	8.0	2.4

¹ Calculated by weighting together the figures for the purchases of industrial and non-industrial services given in Table 15. For definition of the Community aggregate see footnote 1 to Table 15.

² Implied value-added deflators.

³ Estimate.

Source: Eurostat and Commission services.

2.4 In the European Community, the growth of the consumption of services by industry and by services accounts for the major part of market services output growth

It is possible to put all these estimates together and to show which components of demand (intermediate or final) have made the major contribution to the growth of market service output, in the Community, between 1975 and 1982.

As already noted, Table 12 shows how the output of the various services activities distinguished in the 1975 input-output tables for the Community is distributed in 1975 between intermediate consumption (by industries and by

services), and final consumption (by households and by non-resident consuming units).

measured by gross value-added) is estimated to have been 3,2 %.

Between 1975 and 1982 the annual rate of volume growth of the output of market services in the Community (as

The following estimates of volume growth rates (at annual averages for the seven-year period to 1982) can be drawn

Table 17

Community trade with non-Community countries/areas: merchandise and services¹
Average annual growth rates 1975-82 and net balances

(% and millions of ECU)

All non-Community countries	Export (credit) weights 1982 (total goods and services credits equal to 100)	Growth rates		Net balance 1975	Net balance 1982
		Credits (Exports)	Debits (Imports)		
Merchandise (fob)	61.7	13,8	14,8	7 275	- 442
Total market services ²	22,3	16,9	17,6	1 476	38
2.1 Transport	6,9	13,3	13,5	751	1 292
2.2 Insurance on transport	0,2	18,6	19,1	- 40	- 165
2.3 Travel	3,5	14,3	14,3	- 2 317	- 5 815
2.5 Labour income	0,9	20,6	18,6	84	744
2.7 Other services	10,8	20,5	23,3	2 998	3 982
Property income	0,6	:	:	:	- 1 379
Banking	0,4	:	:	:	- 46
Non-merchandise insurance	0,6	:	:	:	981
Construction/engineering	2,5	:	:	:	7 638
Films/broadcasting	0,1	:	:	:	- 89
Other	6,6	:	:	:	- 3 123

¹ In this table the term Community refers to the Community of nine, i.e. the present Community excluding Greece.

² The numbers attached to the headings are those given in the Eurostat balance-of-payments tables.

Source: Eurostat and Commission services.

from the above discussion on the growth of demand for services:

- (i) intermediate consumption:
 - 3,6 % for the consumption of services by industry⁽¹⁾
- (ii) final consumption:
 - 2,4 % for the consumption of services by households;
 - 6,9 % for the export of market services.

Given the requirement to balance demand and output for market services, the growth of market services output between 1975 and 1982 must equal the weighted sum of the growth rates of the components of demand for market services. The contribution of each component of demand to the growth of market services is given in Table 19. It can be shown that the growth of market services output balances the growth of demand provided that the intermediate consumption of services, by the market service sector itself,

¹ The estimate for the period 1975-81 is assumed to apply to the period 1975-82.

grows in line with market service output; that is at an average annual rate of about 3 % per annum.

Thus, from the third line of Table 19 it will be seen that for the period 1975-82:

- (i) more than half of the growth of market services output is accounted for by the growth of intermediate consumption by industry and by services;
- (ii) less than one-third of the growth of output is accounted for by the growth of household consumption of services.

Similar calculations for the four large Community countries are given in Table 20. For three of the four large Community countries, the Federal Republic, France and Italy, the results obtained are close to those for the Community as a whole and the conclusions that can be drawn from these tables are broadly the same. For the United Kingdom, however, the results are somewhat different. In particular the combined contribution of the two components of final demand to market service output is virtually negligible and the estima-

tions needed to balance the table, point to the intermediate consumption of services by services growing very vigorously indeed.

The average annual growth rate of manufacturing industry output in the Community of Six, for the period 1975-82 is estimated to have been 1,6 % (compared to 2,4 % for the period 1975-81). Consumption of the services by industry are estimated to have grown at an average annual growth rate of about 3,5 % in volume terms. The faster rate of growth of services consumption, compared to manufacturing output, is an indication of both:

- (i) the rapid development of specialist service activities serving industry;
- (ii) the separation of certain technical service activities from manufacturing industry itself, and their displacement to the service sector.

The latter structural change will reflect the externalization of service activities by manufacturing industry in response to the demands of efficiency, technical change and the presence of economies of scale.

2.5. Summary of points made

The regressions set out in this section confirm the close link between the number employed in market services and the level of GDP/head. It has been argued that this link could be due to consumers spending an increased proportion of

their income on services as their real incomes rise (that is to say that services have a high income elasticity). The subsequent analysis suggests this is only part of the explanation. A more important development has been that, as the Euro-

Table 18

Community trade in market services with non-Community countries¹
Average annual changes 1975-1982

(%)			
Credits (exports)	Value	Estimated prices ²	Implied volume
<hr/>			
Total market services	16,9		6,9
Transport	13,3		6,0
Insurance on transport	18,6	9,4	8,4
Travel	14,3		4,5
Labour income	20,6		10,2
Other services	20,5		10,1
<hr/>			
Debits (imports).			
<hr/>			
Total market services	17,6		8,1
Transport	13,5		4,3
Insurance on transport	19,1	8,8	9,5
Travel	14,3		5,1
Labour income	18,6		9,0
Other services	23,3		13,3
<hr/>			

¹ In this table the term Community refers to the Community of nine, i.e. the present Community excluding Greece.
² Implied deflators for the item exports of services given in the national accounts statistics.
Source: Eurostat and Commission services.

Table 19

The growth of services output in the European community (EUR 6) the balance between demand and output

	Components of demand for services				Total
	Intermediate consumption by industry	Intermediate consumption by services	Final consumption of households	Exports of services	
Weights from input-output tables for 1975 ¹	0,192	0,345	0,387	0,076	1,000
Estimated volume growth rates ² (%)	3,6	3,1	2,4	6,9	3,2
Contribution to growth of services activity output ³ (%)	0,69	1,07	0,93	0,52	3,2

¹ For definition of activity grouping see Table 11 and annex.

² Estimated average annual growth rates 1975-82.

³ There is a slight discrepancy between the sum of the components, and the total given, due to rounding.

Source: Eurostat and Commission services.

pean economies have expanded, so the purchase of services by industry (and by services) has grown rapidly. Thus in Europe, the growth of services is closely linked to the growth of industry in the broad sense.

Consequently the link between GDP/head and market service employment in the Community, reflects more the growth of indirect demand for services, as a result of the increased consumption of services by industry and services, rather than the growth of direct demand itself. The attached box 'Changes in employment and hours worked in certain market service activities' - provides further evidence, on the employment side, for this conclusion.

3. Overall conclusions

The above discussion leads to the following conclusions;

(i) Part I has shown how in terms of the growth of value-added and employment, market services have increased in importance over the past decade, particularly in the European Community and the United States. The movement has been less marked in the case of Japan. Moreover, in the European countries, labour productivity growth has been catching up with that observed for

manufacturing, traditionally the activity where labour productivity growth is most vigorous. There is also evidence of a shift in the balance of investment and profits away from manufacturing. The data are consistent with the view that the growth of employment in market services has benefited from the lower growth of earnings per head in service activities, both in nominal and in real terms.

(ii) The discussion in Part 2 leads to the conclusion that, for the large European countries, the major part of the recent growth of market services has been due to the increased purchase of services by industry (and by services themselves) rather than the growth of the consumption of services by households. This development is likely to reflect an important structural change, namely the separation of certain technical service activities from industry and their reallocation to services. This amounts to a change in the boundary of manufacturing or industrial activities, and throws doubt on the notion that Europe has been experiencing, in recent years, a process of de-industrialization. This conclusion is consistent with the change in structure commented upon in Part I, insofar as it affects value-added, employment, productivity, investment and gross profits, to the extent that this change in structure reflects the shift in the boundary of industrial activities.

Table 20
Part A

The growth of services output in Germany: the balance between demand and output

	Components of demand for services				Total
	Intermediate consumption by industry	Intermediate consumption by services	Final consumption of households	Exports of services ⁴	
Weights from input-output tables for 1975 ¹	0,219	0,345	0,388	0,048	1,000
Estimated volume growth rates ² (%)	4,4	3,7	3,4	5,3	3,8
Contribution to growth of service activity output ³ (%)	0,96	1,28	1,32	0,25	3,8

¹ For definition of activity grouping see Table 12 and annex.

² Estimated average annual growth rates 1975-82.

³ There is a slight discrepancy between the sum of the components, and the total given, due to rounding.

⁴ These growth rates refer to the total of exports of services as defined for the purpose of the Eurostat balance of payments and the national accounts. They therefore refer to a broader aggregate than that included in Table 18.

Source: Eurostat and Commission services.

Table 20
Part B

The growth of services output in France: the balance between demand and output

	Components of demand for services				Total
	Intermediate consumption by industry	Intermediate consumption by services	Final consumption of households	Exports of services ⁴	
Weights from input-output tables for 1975 ¹	0,289	0,219	0,404	0,088	1,000
Estimated volume growth rates ² (%)	3,8	4,1	3,1	5,2	3,7
Contribution to growth of service activity output ³ (%)	1,10	0,90	1,25	0,46	3,7

¹ For definition of activity grouping see Table 12 and annex.

² Estimated average annual growth rates 1975-82.

³ There is a slight discrepancy between the sum of the components, and the total given, due to rounding.

⁴ These growth rates refer to the total of exports of services as defined for the purpose of the Eurostat balance of payments and the national accounts. They therefore refer to a broader aggregate than that included in Table 18.

Source: Eurostat and Commission services.

Table 20
Part C

The growth of services output in Italy: the balance between demand and output

	Components of demand for services				Total
	Intermediate consumption by industry	Intermediate consumption by services	Final consumption of households	Exports of services ⁴	
Weights from input-output tables for 1975 ¹	0,176	0,328	0,421	0,075	1,000
Estimated volume growth rates ² (%)	5,1	2,8	2,5	3,4	3,1
Contribution to growth of service activity output ³ (%)	0,88	0,92	1,05	0,26	3,1

¹ For definition of activity grouping see Table 12 and annex.

² Estimated average annual growth rates 1975-82.

³ There is a slight discrepancy between the sum of the components, and the total given, due to rounding.

⁴ These growth rates refer to the total of exports of services as defined for the purpose of the Eurostat balance of payments and the national accounts. They therefore refer to a broader aggregate than that included in Table 18.

Source: Eurostat and Commission services.

Table 20
Part D

The growth of services output in the United Kingdom: the balance between demand and output

	Components of demand for services				Total
	Intermediate consumption by industry	Intermediate consumption by services	Final consumption of households	Exports of services ⁴	
Weights from input-output tables for 1975 ¹	0,164	0,362	0,328	0,146	1,000
Estimated volume growth rates ² (%)	2,4	4,2	0,6	-0,9	2,0
Contribution to growth of service activity output ³ (%)	0,34	1,59	0,20	-0,13	2,0

¹ For definition of activity grouping see Table 12 and annex.

² Estimated average annual growth rates 1975-82.

³ There is a slight discrepancy between the sum of the components, and the total given, due to rounding.

⁴ These growth rates refer to the total of exports of services as defined for the purpose of the Eurostat balance of payments and the national accounts. They therefore refer to a broader aggregate than that included in Table 18.

Source: Eurostat and Commission services.

ANNEX

Explanation of the terms and symbols used in the tables

The tables set down data for the total market service activity, distinguished by the NACE-CLIO nomenclature (as used to compile the Community's input-output tables) established according to the concepts and definitions of the European System of Accounts (ESA). In addition, in Tables 1 to 9, comparable data are given for the branch 'Manufactured products', and for the economy as a whole. Further details of the ESA concepts and definitions are given in the volume European System of Integrated Economic Accounts (ESA) Eurostat 1979.

For reference purposes the total for 'Market services' (NACE-CLIO code No 68) equals the sum of:

- 56 Recovery and repair services, wholesale and retail trade services equal to the sum of:
 - 55 Recovery and repair services
 - 57 Wholesale and retail trade
- 59 Lodging and catering services
- 61 Inland transport services
- 63 Maritime and air transport services
- 65 Auxiliary transport services
- 67 Communication services
- 69 Services of credit and insurance institutions
- 74 Other market services equal to the sum of:
 - 71 Business services provided to enterprises
 - 73 Renting of real estate
 - 75 Market services, education and research

- 77 Market services: Health
- 79 Other market services.

The figures given in the tables for the European Community are for the aggregate EC 6 which is the sum of Belgium (B) the Federal Republic of Germany (D), France (F), Italy (I), the Netherlands (NL) and the United Kingdom (UK). The proportion of total Community GDP accounted for by this aggregate, in 1982, was 95,1 %.

The data for the United States (USA) and Japan (J), which have been brought into line with the concepts and definitions of the ESA, are derived from national sources.

In certain tables there are minor discrepancies between the totals given and the sum of the individual components.

In constructing input-output tables activity 56 often plays a special role in balancing the tables and so it has been excluded from the analysis of Part 2. Activity 73, which includes substantial imputed transactions for the housing services consumed by owner-occupier households, has also been excluded.

Many of the points made in the text depend upon a comparison of measures of gross value-added for market services and manufacturing. As a rule it is more difficult to measure the value-added of market services than it is for manufacturing activities, and the measures for the former may be subject to a wider variance than those for the latter. This point should be borne in mind when interpreting the data.

Changes in employment and hours worked in certain market service activities

The analysis set out in Part 1 was concerned with changes in the structure of employment at a relatively macroeconomic level, and showed the increased importance, particularly for the European Community and the United States, of total market services both from the point of view of employment and of gross value-added. Part 2 showed that, in Europe, increases in intermediate demand for services by industry and services themselves accounted for the major part of the growth of the output of market services. It can be shown that this development is also reflected in changes in the structure of market service employment itself. Unfortunately, owing to a lack of data for earlier years, it is not possible to estimate changes in the structure of market service employment for the Community as a whole, nor for the Community of Six (D + F + I + UK + B + NL) for which details are given in the main part of the chapter. However, it is possible to observe changes in the structure of market service employment for the following grouping of six countries D + F + I + NL + B + DK which accounted for some 82 % of Community GDP in 1982. Data for this grouping of countries are given in Table 1. In the table the total activity branch market services has been subdivided into five smaller service branches of which 'Other market services' covers a wide range of activities including the activity group 71 'Business services provided to enterprises'. From Table 1 it will be seen that, in all three economies, the proportion of total market service employment accounted for by 'Credit and insurance' and 'Other market services' taken together increased markedly between 1970-72 and 1980-82, and the increase appears to be greatest for the Community. A whole range of services provided to enterprises are included in these two activities and this change in structure is consistent with the results given in Part 2 of Chapter 3. This interpretation of the data is also confirmed by a recent analysis of employment trends in the Federal Republic

of Germany and the United States.¹ It must also be noted that, in all three economies, there was a drop in the proportion of total market service employment accounted for by 'Retail and wholesale trade', and by 'Transport and communication'.

These developments in employment trends in certain service activities are confirmed by the data given in the annual publication of Eurostat *Employment and Unemployment*.

Trends in employment in NACE class 8 'Banking and finance, insurance, business services and renting' between 1980 and 1983 are given in Table 2 together with trends for the total of service employment (including 'Non-market services'), NACE classes 6-9, for the aggregate D + F + NL + B + UK + DK (which accounted for 83 % of Community GDP in 1983).

Table 2 shows that business service employment continued to grow more vigorously than total service employment between 1980 and 1983 despite the sharp decline in industrial production between 1980 and 1982 and only a modest recovery in 1983. Moreover the growth of employment for females was much greater than that for males.

The improved labour productivity performance of market services in Europe, noted in Table 5 is based on calculations of growth rates of value-added per head. However, the data on hours worked per week available from Eurostat suggest that the result would be broadly the same if account was taken of changes in the weekly hours worked per full-time employee.

¹ See M. Wegner, 'Die Schaffung von Arbeitsplätzen im Dienstleistungsbereich': *IFO Schnelldienst* 6/85.

Table 1
Changes in the structure of market service employment

	EUR 6 ¹		USA		Japan		(%)
	1970-72	1980-82	1970-72	1980-82	1970-72	1980-82	
Retail and wholesale trade	44,7	41,2	39,5	38,7	42,9	40,7	
Lodging and catering	8,3	8,2	11,2	11,3	13,5	14,8	
Transport and communication	17,2	16,0	11,1	9,7	14,9	13,1	
Credit and insurance	6,1	6,9	5,9	6,3	4,7	4,6	
Other market services	23,8	27,6	32,4	34,0	23,9	26,8	
Total market services	100,0	100,0	100,0	100,0	100,0	100,0	

¹ EUR 6 = D + F + I + NL + B + DK.
Source: Eurostat.

Table 2

Trends in employment in certain service activities
Indexes 1980 = 100

	1980	1982	1983
NACE Class 8: Total	100	102,1	103,0
of which: Female employees	100	103,6	105,0
NACE Classes 6-9: Total services	100	100,6	100,9
Memorandum item; Industrial production	100	96,2	97,1

Source: Eurostat.

Thus on the basis of the data set out in Table 3 there is no evidence that hours worked per week in services, taken as a whole, have evolved significantly differently from those in industry.

Table 3

Weekly hours worked
Indexes 1973 = 100

		1973	1981	1983
NACE Class				
Industry	2	100	94,4	94,1
	3	100	94,7	95,2
	4	100	94,6	95,0
Services ¹	6	100	94,3	94,6
	7	100	93,9	93,6
	8	100	95,7	96,4
	9	100	94,1	95,6

¹ These codes stand for the following NACE classes:

- 6: Distributive trades, hotels, catering, repairs;
- 7: Transport and communication;
- 8: Banking and finance insurance, business services, renting;
- 9: Other services.

Source: Eurostat.

The leasing of investment goods

In Part I a change in the structure of investment in the European Community was noted (see Table 6) with (apparently) market services making an increased contribution to total investment and the contribution of manufacturing industry declining. It was noted, however, that these figures could be influenced by changes in the extent to which capital goods are leased by one enterprise (the user) from another (the owner). The data upon which the investment analysis given in Table 6 is based, provide a measure of the ownership, rather than the use, of investment goods. However, some information is available on the patterns of ownership and use of investment goods, for two of the large Community countries, the Federal Republic of Germany and the United Kingdom.

For some years the IFO Institute has published data for the Federal Republic of Germany giving the distribution of fixed investment and the capital stock by both user and owner industry/activity group. The investment data are summarized in Table 1 where it will be seen that:

- (i) the differences between the structures of fixed investment by owner and by user, increased markedly between 1970 and 1982;
- (ii) consequently although between 1970 and 1982 there has been a shift in the structure of fixed investment when ana-

lysed by user activity, this change in the structure is much less marked than when analysed by owner activity. Indeed, on the former basis the increase in the contribution of market services to total fixed investment between 1970 and 1982 is perhaps half the increase measured on the latter basis.

For the United Kingdom a similar though somewhat less detailed analysis is possible. This is set out in Table 2. Here again it will be noted that the impact of leasing is to modify substantially the shift in the structure of investment between 1975 and 1982 (the former year being the earliest one for which data on leasing are published). Thus on the ownership concept the contribution of market services (in the narrower sense, that is excluding dwellings) to total investment increased from 23,7 % to 31,3 % over this seven-year period. However, when allowance is made for leasing and the figures are converted to a user basis, the increase in the market services contribution was a more modest six percentage points, from 23,0 % to 29,0 %.

In conclusion therefore, it would appear that on the basis of the limited information available, perhaps as much as one quarter to one half of the shift in the structure of investment, noted in Table 5, in favour of market services, reflects the increased importance of leasing activities.

Table 1

The Federal Republic of Germany: the impact of leasing on the structure of fixed investment^{1, 2}
Based on data at constant 1976 prices

	1970						1982					
	(i)			(ii)			(i)			(ii)		
	(i)	(ii)	(iii)	(i)	(ii)	(iii)	(i)	(ii)	(iii)	(i)	(ii)	(iii)
Manufacturing ³	24,0	24,7	0,7	17,9	20,8	2,9						
Market services ³	46,9	46,0	-0,9	56,1	51,9	-4,2						
— Retail and wholesale trade	5,0	5,9	0,9	4,6	6,7	2,1						
— Transport and communications	8,3	8,5	0,2	8,9	9,4	0,5						
— Credit and insurance	1,5	1,6	0,1	1,8	2,5	0,7						
— Ownership of dwellings	25,8	25,8	—	25,1	25,1	—						
— Other services	6,3	4,2	-2,1	15,7	8,2	-7,5						
Market services, excluding dwellings	21,1	20,2	-0,9	31,0	26,8	-4,2						
Total	100	100	—	100	100	—						

¹ Source: IFO Studien zur Strukturforchung Num. 6, Investitionen und Anlagevermögen der Wirtschaftszweige nach Eigentümer- und Benutzerkonzept, Gerstenberger, Heinz and Vogler-Ludwig.

² Key to columns: (i) Structure by ownership; (ii) Structure by user; (iii) Difference.

³ The figures are drawn from an analysis based upon the official German classification of activities.

Table 2

The United Kingdom: The impact of leasing on the structure of fixed investment^{1, 2}
Based on data at constant 1980 prices

	(%)					
	1975			1982		
	(i)	(ii)	(iii)	(i)	(ii)	(iii)
Manufacturing ³	16,2	0,7	16,9	11,5	2,3	13,8
Market services ³	23,7	-0,7	23,0	31,3	-2,3	29,0
— Retail and wholesale trade, hotels, etc.	6,0	—	6,0	7,7	—	7,7
— Transport and communications	10,4	—	10,4	7,0	—	7,0
— Financial and business services	7,3	-0,7	6,6	16,6	-2,3	14,3
Total	100,0	—	100,0	100,0	—	100,0

¹ Source: Department of Trade and Industry and Central Statistical Office.

² Key to columns: (i) Structure by ownership; (ii) Adjustment for leasing; (iii) Structure by user.

³ Data according to national industrial classification. The total for market services excludes dwellings and certain other services. These figures are therefore not directly comparable with those in Table 1.

Chapter 4: Technological progress, structural change and employment

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Chapter 4: Technological progress, structural change and employment

Technological progress acts both as a suppressor as well as a creator of employment: long-run economic growth results mainly from improvements in production technology and new product innovation. Technological innovation can help eliminate structural unemployment in the Community but only if an economic strategy based on knowledge-intensive, high-value-added structures which revitalises our level of international competitiveness is implemented.

In this chapter the role of technological change as the driving force of economic growth will be examined. Because of the growing interdependency of the world economy variations in the relative innovativeness of individual countries should explain the shifts in geo-economic power evidenced in the preceding chapters.

The association of rising levels of Community unemployment with the introduction of new technologies highlights the importance for policy-making of a clear analysis of the processes by which technological change either helps to create new employment or suppresses existing positions. Unresolved debates among economic growth theorists assume very real importance as Community policy-makers debate the best strategy to relaunch the growth process and reverse the trend towards increasing unemployment.

The process whereby advances in science, technology and techniques affect such economic aggregates as the rate of investment and the demand for labour, is complex in reality: this chapter will attempt to outline some of the main characteristics and manifestations at stages along innovation trajectories so as to distinguish the main determinants of the evolutions described in the preceding chapters and suggest a framework for future policy consideration.

The argument will be advanced that a long-term strategy for science, technology and innovation is an essential element of economic and social policy. It must also take into account the strategies of our major international competitors. Brisk competition between Community firms must be encouraged; national champions should not be replaced by a policy of sheltered Community champions. The direct employment content of high technology production industry is low, probably only 3 % to 5 % of employment in the most advanced economies: the real importance lies in its role as a generator of new wealth and in the application of high-tech components, materials and production technology in a host of other sectors so as to ensure their continued competitiveness and viability. The possession, access and capacity to exploit the latest technologies is essential to the health of a full employment economy. New technology may be used to revive the competitiveness of traditional sectors thus alleviating the social distress associated with structural adjustment.

Thanks to its unparalleled flexibility and accessibility it offers great potential for regional development.

If new technology is to expedite structural change the innovation absorption capacity of the receptor society must be developed, otherwise innovation cannot take root. Some Community members lead the world in their contributions to science and technology yet many persons in these societies remain involuntarily unemployed because the infrastructure which would enable the conversion of these advances into useful employment has not been developed.

The employment-destructive effects of new process technology is especially witnessed and highlighted when large numbers of organized workers are made redundant. New product innovation, on the other hand, can lead to investment growth: in the case of a major advance in generic technology it can lead to an historically-significant economic boom, but only in those societies whose institutions are changing *pari passu* so as to exploit the beneficial effects of the technology wave.

1. From invention to innovation

The source of invention and technological advance is research. Incremental innovations are important at the micro-economic level but untargetted research may have major macroeconomic effects. Because such knowledge is highly transferable the beneficial economic effects may be reaped in an economy different from the invention source country. The nature of invention is changing and the rate of technological change accelerating.

There are many different types of innovation, each having different effects on economic parameters and social organization. In simple terms science is concerned with 'know-why'; technology with 'know-how'. Idealistically innovation is the successful production and commercialization of a continuum of activities which starts at the scientific discoveries of fundamental research and leads on through development to the commercialization of the technology. But practice is more complex.

Since scientific advance is the formulation of laws and knowledge about the physical world without any economic consideration such fundamental research is only undertaken in universities or scientific institutes and laboratories. A very limited number of large commercial firms do conduct what they refer to as fundamental research but such activities should be more precisely referred to as basic industrial research.

So, one might consider the research conducted at CERN seeking to unify the fundamental forces of nature as fundamental research, while that at the Joint European Torus (JET) into harnessing thermonuclear power for electrical generation as basic industrial.

Applied research is also original investigation but is directed towards practical applications: experimental development draws on the above type of research to assist in the production of new products, processes and operational systems. Again, the essential characteristic is that of novelty. New technology results when such advances in science, engineering and organization are applied to the industrial arts.

So one should distinguish between invention, which is the conceptualization of a new product or process, and innovation which is the transformation of such a programme into a new or improved product or process for commercialization in the market place.

Since it is successful innovation (e.g. the development of penicillin as a medicine or of bio-engineered human interferon) which leads to the generation of employment, rather than scientific discovery (the original identification of the penicillin effect or of the structure of DNA, the blueprint of genetic organisms) we will emphasize the role of the innovator/entrepreneur rather than that of the inventor/scientist, while attempting to identify why Europe seems less capable than its trading partners at the economic and social exploitation of the fruits of European insight. Because the economic effects of advances made by scientists in their laboratories can differ greatly from the effects of advances in technology made by engineers, and the process of diffusion through the economic network adopt very different trajectories, we will outline some major types of innovation by origin and consider how they disrupt existing economic structures.

Technological innovation is evidenced mainly in the form of new or improved products and processes. Of course, the distinction may not be so neat in reality; a new computer may be regarded as a product innovation by the computer sector but as a process innovation to a firm using it for production control. Still, such distinctions are important: there are higher levels of risk associated with the introduction of a new product (e.g. a new aeroframe built of carbon fibre and composites) than incremental improvements to existing products (e.g. a more critically shaped airfoil using existing aluminium).

The generality that innovation flows from scientific advance does not always hold true: the first industrial revolution, based on steam power, resulted from the contributions of

artisans and toolmakers and owed little or nothing to pure science. In this instance, technological practice preceded the scientific explanation of energy generation and conservation. But such pervasive, or generic technologies as electricity and bio-engineering, which have had and will have a profound effect on the structure of industry and on the international specialization in such new activities, have had their origin in advances made in fundamental research: the theories of electromagnetism led to the birth of the electrical industry, while research conducted in the UK into the structure of genetic material led US scientists to the idea of specially engineered genetic structures. The electronic revolution was spawned by basic industrial research, which resulted in the transistor. This discovery fuelled the growth of the data-processing industry in the US, and those sectors pivotal for Japanese post-war economic growth based on consumer electronics.

Untargetted basic research conducted within the Community into the body's system of immunization was to lead later to the unexpected discovery of monoclonal antibodies, a medical breakthrough on a par with that of antibiotics. But, as in the case of penicillin, radar, jets, early computers, the patent rights were taken out by US firms. This latter characteristic of technology, its high level of international mobility, help explain why a country with a proven record at invention may not subsequently excel at innovation.

It is estimated that over 90 % of mankind's total heritage of scientific knowledge was contributed since the last world war: the sum of such knowledge is expected to double again within the next 15 years. A more recent characteristic of new technology is that its advance is being augmented by powerful new instrumentation and the confluence of advances in other areas of science and technology. The advance of chemistry in 19th century Germany was largely the result of a painstaking process of trial and error, a game of molecular roulette: advances made nowadays into such genetically re-engineered products as insulin and interferons are now specifically designed thanks to advances in theory combined with such advances in instrumentation as the electron microscope and the computer. Placing of communications satellites in geostationary orbit by the Ariane launcher is only possible because of the timely confluence of the necessary scientific and technological conditions. Had the design of rocket motors not been sufficiently advanced such satellites could not reach such an orbit; without the data-processing hardware and software based on miniaturized semiconductors the craft could not be controlled, never mind navigated to a precisely calculated orbit. It is becoming apparent that the main characteristic of the economically significant scientific advances which have the most pervasive impact on large areas of economic activity, is that they are multidisciplinary.

nary, often resulting from a timely confluence of a number of theoretical and technological breakthroughs each of which is vital to success. Examples of such confluence breakthroughs are the development of radio and TV, the semiconductor, atomic fission, programmable computers and biogenetics.

Confluence inventions depend mostly on the contributions of scientists: by far the most numerous advances in technology result from the efforts of engineers giving rise to incremental improvements of products and processes. Because such incremental advances in technology do not involve the great uncertainties of long-lead-time fundamental research, they incur the lowest level of technical and commercial risk, but play a major role in determining relative competitiveness, especially between existing firms. This form of innovation has constituted a key strategy of Japanese medium and long-term economic policy and is allied to innovation in production engineering and quality control. The aggregate effect of such incremental technological innovation is probably as significant economically as that of the historically rare scientific breakthroughs, but the latter probably have a much more pronounced effect on long-term investment cycles and international shifts in comparative advantage.

2. Innovation

Innovation is when the economic rewards of human inventiveness and insight are first realized; the economic risks and costs increase progressively with each stage of market introduction. This market introduction stage is the weak link of Community science and technology policy: it results not so much from a technology gap as from an institutions gap.

Innovation is the initial commercialization of invention: it includes the conducting of market research, raising the various stages of finance, hiring management and workers, investing in production plant and equipment, and setting up the distribution network. In some cases e.g. new model atomic power stations, the invention may be innovated simultaneously, whereas in others there is a long delay before commercial potential is realized, e.g. the theory of coherent light was theorized at the turn of the century, a prototype laser produced in the 1960s and only commercialized for domestic use in the 1980s in digital electronic systems.

The objective of an entrepreneur or innovating firm is to reap the supernormal profits which market leadership confers on those who can protect their invention from imitation and internalize the commercial rewards. Some other products or processes are first innovated primarily for reasons of na-

tional security (early jet engines), national prestige (lunar and planetary probes), industrial safety (early robots in nuclear installations), or skill shortages (the stimulus to numerically-controlled machine tools in Japan). But the normal objective of innovation at the private firm level is the maximization of output from resource inputs and/or the introduction of new products which are expected to satisfy latent demand ahead of potential competitors.

It is this hope of tapping the reservoir of unrealized, latent demand for new products which has driven entrepreneurs to undertake the high risk, delayed revenue-profile of novelty investment rather than the normal profit expectations of competitive mature product investment. It is this challenge which leads to the birth and death of firms at a micro level and, later, to structural change at a macrosectoral level when the innovation is diffused among other firms. It is the relative ability of the fabric of an economy to convert the advances of science and technology made at home and abroad into a socially useful activity which determines relative rates of long-term economic growth.

The commercialization stage of innovation is generally considered to involve far larger financial expenditure than the technical research stage, hence greater financial risk.¹ The risk of market failure is probably greater than at the engineering stage, the classic example is that of Concorde which has had a brilliant technical record.

In the case of limited-differentiated product innovation, e.g. a new 32-bit microprocessor, the time lead is of the essence: economic scarcity profits may be made in the first few months before a competitor with a differentiated design specification puts a competitor product on the market and, as the cost performance curve drops with production experience, the competitor's price may be consistently but profitably undercut. The spoils of innovation victory are awarded to the leader.

A good example of such competitive pricing is that of one US 16-bit chip whose price dropped from USD 250 in 1979 to USD 40 in 1983, to about USD 12 in 1985. It is not

¹ The imaginative and successful Small Business Innovation Research (SBIR) program of the US National Science Foundation makes do with a maximum grant of USD 50 000 for the first phase of scientific or engineering research. The most promising of these may then qualify for phase II funding of between USD 200 000 and 500 000. After this the firms must obtain private commercial financing. The experience of the last few years has been to award an SBIR grant to one in 10 applicants, just half of the projects have brought products or services into being, a quarter generating commercial sales of which a quarter were exported. These results would suggest a very high success rate. Private venture capital firms might fund only one in 30 applications.

unusual for the real cost of mainframe computers to drop by 20 % to 30 % per annum.

Were a frequency distribution of innovation to be drawn with cost on the vertical axis the resulting histogram would appear highly skewed towards the axis and with a long tail indicating a great number of innovations costing relatively little. It is this high cost of major innovations which led Schumpeter to suggest that innovation is so risky that monopolistic market structures are most conducive to its spread. This is probably an oversimplification, though there are exceptionally high financial thresholds to entry into software language, data networking, submicron chip production, to cite a few examples.

It is the facility whereby budding US entrepreneurs have easy access to finance for innovation, together with a cultural and institutional climate favourable to risk-taking which is frequently proposed as the explanation of the greater ability of the US economy, compared with Europe, to socially exploit the fruits of human ingenuity. Europe's ability to undertake successful intellectual investment and absorb its army of educated unemployed, bears little relation to its ability to win Nobel prizes for natural science. Banks take a jaundiced approach to loaning to entrepreneurs when they may only hope to charge a marginally higher interest rate and the projects entail a risk order of much higher magnitude compared with that of mature cycle investment and, especially, portfolio and property investment. Individuals are deterred from high risk, delayed liquidity venture capital investment if the commercial climate is unfavourable, back-up component and service supplies not readily accessible and personal tax rates on eventual rewards deemed punitive. It is suggested that the greater flexibility of US institutions, such as the tax breaks offered for participation in research and development limited partnerships (RDLPs) accounts for the greater success of that country at converting invention into gainful employment. According to the US National Science Foundation¹ during the period 1953-73 small firms produced about half of the major US innovations, or four times as many as large firms for each R&D dollar, yet received less than 4 % of all Federal R&D funds.

In the case of the Community our frequency distribution would tend to be much less skewed than that for Japan, indicating a greater emphasis on long lead research and investment-intensive innovation. The Japanese strategy in the past was to concentrate on incremental innovation of existing technology, with the major part of the effort concentrated on advances in process and manufacturing tech-

nology. This strategy reduced risk, increased the productivity both of capital and labour and promoted the development of a manufacturing base both cost-competitive and quality-oriented. When otherwise unavailable the technology was purchased abroad via licences (a situation which has now been reversed) and effort concentrated not on reinventing the technological wheel but in improving its mode of manufacture and final quality. The Japanese learned the importance of global economies of scale, but they did not overlook the importance of the home market as a test launching pad from which innovative products were introduced.

The more one examines cases of internationally successful innovation the more one is drawn to investigation of institutional obstacles as the main impediment to the conversion of successful invention to successful innovation. Until recently it was difficult to argue that Europe's lack of innovativeness was due to a technology lag: unfortunately that situation is also changing.

In a very interesting study of national patterns of innovation Chakrabarti, *et al.*² found that between 1953 and 1973 the US share was falling. The US and Japan targetted more towards the consumer goods sectors than did European firms. The UK has a strong bias towards 'radical' innovation while Japan tended towards 'improvements'. In Japan innovations occurred under conditions of greater competition, had more devoted to internal use of the firm, but practically none originated among small firms.

3. The diffusion of new product technology

When an innovation is diffused its economic effects are felt at a macrosectoral level. But intellectual property rights to the technology are even more important than the high-tech products themselves. The pattern of international transfer of technology is being affected by the trend from multinational to global production. Some country's fiscal and tariff strategies may need to be adjusted to this new reality or they will force themselves into a situation where they have to choose between ownership of enterprises with low employment potential and the importation of mobile employment positions.

¹ *Invention Management*, Vol. 10, No 4, April 1985.

² A. Chakrabarti, S. Feinman and W. Fuentivilla, 'The Cross-National Comparison of Patterns of Industrial Innovations', *The Columbia Journal of World Business*, New York, Vol. 17, No 3, Fall 1983.

An innovation is diffused when one or more firms other than the innovator introduce the new product or process. Normally the inventor will have filed an invention patent which confers exclusive rights to the inventor and protection from imitation by others.

Ideally a patent is granted to a non-obvious invention of a highly differentiated piece of technology, e.g. the specific chemical structure of a novel prescription drug, which confers a temporary monopoly right on the inventor. On the expiry of the patent (usually less than 20 years, though the 50-year copyright protection of computer software is a conspicuous exception) other firms are then free to imitate, as is now happening to the patent rights on colour television. The temporary monopoly conferred on the innovator should serve as a reward for the risks of R&D and, ideally, as an encouragement to further research. Much depends on the national patent system, in the US and Japan new micro-organisms may be granted patent protection but this is not yet true for European researchers.

But many technological advances lack blatant non-obviousness and may be imitated, legally or illegally, especially by foreign competitors resident under different jurisdictions. In many cases it is possible to circumvent a patent by designing small differences into a competing product, examples such as the suspension of an automobile, machine tool, memory chip or personal computer spring to mind. (In the case of genetic engineering a rival who gains hold of even a minute quantity of a new micro-organism can achieve replication within hours.) So the innovation becomes diffused very soon after initial market introduction.

In the case of a small firm lacking a developed market structure the right to exploit the technology may be sold by licence to a third party, usually a firm in a foreign country with a market network not encroaching on that of the innovator. Examples of such licensing are those for the audio tapes, float glass, colour TV and digital recorders. In this case the innovator may gain very substantial revenue with which to conduct further R&D, but the benefits to the national economy appear not in the form of exports or domestic employment, but as an inflow for royalties in the national balance of payments.

There would now appear to be a major change of strategy and organizational structure on the part of the most internationally competitive firms. The previous strategy of the multinational firms establishing production facilities overseas, with products frequently tailored to meet local tastes, is being replaced by production of standardized products for global and not just multinational markets. The key to this change in strategy would frequently appear to lie in the

distinction between the product itself and the technology and technical standards which are embodied in it.

The increased interdependency of national economies leads to increased globalization and standardization of production; this means that a firm which manages to impose its proprietary standards on such new technologies as audio and digital recorders, data communications network architecture, computer software, may expect not only to reap substantial rewards from licensing agreements but to exercise through this function a great influence on commercial developments for that technology worldwide. At a macro-economic level a country which succeeds in imposing its technical standards on world markets becomes a net exporter of invisible items reflected in its balance of payments. Its interest would then lie in opposing protectionism and all tariff barriers to trade in goods, especially those on which it is being paid a royalty by a licenced manufacturer.

The strategies whereby globally-competitive firms diffuse and gain acceptance for their own technical standards has changed considerably in recent years. In the field of consumer electronics, for example, the increasing ingenuity of strategies over the years for colour TV, video recorders, analogue and digital audio equipment and home computers, are instructive.

For a firm wishing to achieve global competitiveness a large, unified, but non-protectionist internal market provides an invaluable base, especially for products whose scale economies are being increased by new production technology. This is particularly true when the presence of a number of domestic rivals is opportune to stimulate further competitiveness. A lower level of purchase tax compared with that imposed on the domestic market of foreign competitors will accelerate market penetration and a reduction in production costs along a sharply-declining cost-performance curve.¹ Tariff protection may help domestic producers increase market share at the expense of foreign competitors, but can prove strategically defeating if domestic producers exploit it to maintain less-than-globally-efficient production structures. In a technologically-dynamic sector a tariff may be considered as offering a time-advantage to a domestic producer, e.g. if his technology is a year behind that of a foreign market-leader in a sector where the sales price is being reduced by 30 % each year, a 15 % tariff may be considered as having a six-month reduction effect on the technology gap. But such tariffs usually only encourage the foreign

¹ In this regard it is interesting to note a proposal by an extra-Community country to grant a three year purchase-tax holiday to new-technology products.

producer to further reduce production cost, thus improving competitiveness and international market share. It may also encourage the foreigner to establish production facilities behind the tariff wall, thus further eroding the market share and employment potential of the domestic producer.

A serendipity effect of the US space programmes of the 1960s was the development of data communications network standards among a host of subcontractors: this helps explain the high international specialization of US information-technology firms in the 1980s and provides evidence of the attractions of early market entry and definition of standards in frontier technologies. The latest US space initiative will almost certainly have a similar effect on many emerging technologies of the late 1990s. It is to ensure that Europe will not miss out entirely on this coming wave of new technologies that the Community has launched its proposal 'Towards a European technology community'¹ in June 1985.

The Community must maintain international specialization in a range of technologies with substantial manufacturing facilities and employment-generation within member economies. It would be invidious if diffusion of Community inventiveness was invariably undertaken abroad, encouraged by internal inflexibilities, while incentives were simultaneously offered to foreign firms to replace direct exports to the Community by establishing assembly plants in a Member State. The long-term effect would be the reduction in European ownership of enterprises for the sake of externally-determined employment.

4. Process technology and productivity growth

The object of process innovation is the improved productivity of labour and capital, particularly as a response to increased competitiveness of our trading partners. But the replacement of variable cost labour by programmed automation is not always economically or socially efficient if such technology is imposed on sub-optimal manufacturing systems. Input productivity growth will increase demand for both capital and labour factors if demand for the final product is positive, but market shares will be captured by the most competitive trading partners.

The object of process innovation is increased productivity of labour and/or capital: new technology is the means to this end. When a new process technology affects technique in a particular sector its economic effects, when diffused

throughout the sector, is macrosectoral; when a new process technology such as information technology is pervasive to all sectors its effects are macroeconomic as across-the-board advances in productivity accelerate the growth rate of the entire economy. The virtuous cycle of productivity, profitability, investment is conceptually applicable both at the micro and macroeconomic levels.

In Chapter 2 evolutions of productivity are calculated for the factors labour and capital. These increases result from two major trends; capital deepening as relatively greater amounts of capital of fixed technical capacity is combined with labour, and what one might call 'capital enrichment as technological advance enhances the capacities of capital equipment relative to its cost, i.e. the incremental capital/output ratio begins to decline. The latter developments were especially encouraged when, as in the late 1960s and early 1970s, the real cost of labour increased rapidly and its supply was restricted by reduced working hours. This reduced the risk to capital-producing firms of incurring the threshold costs of R&D into numerically-controlled machine tools, robotics and programmed automation which reduced the demand for labour relative to the output potential of the new capital goods. It also changed the mix of demand for labour of varying skills as semi-skilled workers performing repetitive tasks were made redundant and skilled programmers, electronics engineers and specialized supervisors were recruited.

In some cases European firms reduced their variable costs as they made variable-time production workers redundant but increased fixed costs as they recruited professional salaried staffs and bought more advanced capital equipment. Investment in flexible manufacturing systems and robotization will not necessarily improve the competitiveness of a firm if it substantially increases the fixed cost of professional supervisory and maintenance staff while the new capital equipment cements suboptimal engineering and production procedures.

The impact of new technology on demand for factor inputs depends on the type of process involved. In the case of continuous processes such as an oil refinery or chemical plant, labour costs generally represent only a small proportion of costs so research is directed towards capital productivity, e.g., a lower use of energy by developing less-hostile-environment reactions.

It is in the mass production of discrete products that the public is most conscious of the pace of innovation. Despite automation waves in the 1930s and 1960s this form of production is still intensive in its demand for medium-skilled, repetitive-task labour. Since new information technology

¹ COM(85) 350 final.

in the form of programmed automation and management systems (which includes computerized design, computer-controlled machine tools, robots and materials handling equipment, production and inventory management) is ideally suited to replace most human repetitive tasks, the effects of process innovation in this case has been directed at improving labour productivity as well as capital productivity.

The Chapter 2 data show that it is in those sectors where the diffusion of new technology is fastest that growth of capital productivity is highest, i.e. the relative increase in capital input is less than that of the increase of output (in which case the indices are positive). The data show strong evidence of this new trend, especially in Japan and Italy. So the fear of capital-shortage unemployment is less justified. This is particularly true of product sectors for which price-elasticities of demand are positive and relatively high. As demand for such products increases more than proportionately as selling price falls, the demand for capital and/or labour inputs can rise in such sectors. The evidence appears to sustain the separate argument in section 2 of this chapter that demand for new technology products tends to stay relatively high over time and leads to increasing demands for inputs which are sufficiently strong to more than offset a combination of rising productivity of both capital and labour. In economic terms the inward shift of the entire production isoquant raises the marginal revenue product of both inputs under conditions of elastic demand. In our open trading world the increases in demand for factors will benefit those economies achieving the highest level of sectoral competitiveness. It is this competitive pressure which is speeding up the rate of international diffusion of technology.

5. National financing of R&D

The pattern of R&D expenditure by objective differs greatly from one Member State to another. Many defence projects are suitable for dual use and this can considerably advantage sectoral competitiveness. Conventional estimates of comparison of R&D intensity may overestimate that for the Community and the US but underestimate that for Japan.

In 1981, the latest year for which internationally comparable data is available, the Community gross expenditure on R&D (GERD) reached 44 100 million ECU; US GERD equalled 1.5 times that of the Community, while in Japan it equalled half that of the EC at 21 400 million ECU.

Because of the undervaluation of the yen, and the lower cost of conducting R&D in Japan, the above calculations

considerably underestimate the magnitude of the Japanese effort. Since there is a considerable element of duplication of effort within the Community money values tend to exaggerate the real effort here also, so it is probably true to claim that Japanese real civilian R&D effort now approaches that of the Community civilian effort, though with much greater skewing towards the development end of the spectrum.

A characteristic of the most technologically dynamic economies is their tendency to denote over 2 % of annual GDP to R&D. In 1981, the Community average was just over 2 %, a figure equalled by France, but exceeded by the UK at 2.4 % and Germany at 2.5 %. Other members spent less, such as the Netherlands with 1.9 % and Italy with 1 %. That same year Japan recorded 2.4 % and the US 2.5 %. The US has budgetted 2.88 % of estimated GDP for R&D in 1985.

The share of government-financed R&D in gross national expenditure on R&D also differs considerably between Member States. The Community average stood at 48 % in 1983. Some countries had shares below this average: Belgium (31 %), Germany (42 %), Italy (47 %), and Netherlands (47 %). Other countries exceeded the average: UK (50 %), Denmark (52 %), France (58 %), Greece (72 %), Ireland (74 %). Government-financed R&D is usually concentrated on basic and applied research while private firms normally specialize in experimental development.

Defence R&D can have major commercial multiplier effects if the new products and processes are 'dual-use' such as jet engines, airframes made from new materials, opto-electronics, very high speed integrated circuits and their manufacturing processes.

Because of its various defence and space commitments the public share of US GERD in 1983 exceeded 50 %. In 1982 the Japanese Government financed 24 % of natural science R&D. A notable feature of GERD programmes is the variation between different countries in commitment to defence R&D as is illustrated in Table 1, which shows the structure of R&D budgets in 1983 and 1984 for the Community. (For a detailed analysis of Member State R&D budgets by objective and their recent trends, the annual report of the Community Statistical Office, 'Government financing of R&D in Community countries' should be consulted.) For the Community as a whole, public R&D appropriations are shown to have grown by an average annual 2.1 % between 1975 and 1983.

In the USA government allocations to R&D were estimated at USD 45 500 million in 1984, with USD 15 800 million devoted to civilian research. R&D budgets increased by an

Table 1

Breakdown of R&D budgets by objectives in 1983 and 1984

	D		F		I		NL		B		UK		IRL		DK		GR		EUR 10	
	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984
1. Exploration and exploitation of the Earth	2.2	2.2	3.0	2.0	1.6	1.5	0.8	0.6	3.5	2.6	0.6	1.7	0.8	0.6	2.8	1.7	—	—	1.9	1.9
2. Infrastructure and general planning of land use	3.2	2.3	3.5	3.5	1.0	1.1	5.6	4.6	4.0	2.6	1.1	1.5	7.5	6.9	2.9	2.9	—	—	2.7	2.5
3. Control of environmental pollution																				
4. Protection and improvement of human health	5.8	{ 2.8 3.2	5.6	{ 0.5 3.8	5.3	{ 1.9 3.9	6.1	{ 3.2 2.5	(7.9)	{ 2.2 7.6	2.1	{ 1.3 3.5	6.4	{ 0.9 4.2	(10.7)	{ 1.1 4.6	—	—	5.1	{ 1.7 3.6
5. Production, distribution and rational utilization of energy	16.9	15.0	7.3	7.9	23.3	20.7	4.4	4.7	7.9	7.8	5.3	4.8	2.9	2.3	10.5	7.2	—	—	11.1	10.3
6. Agricultural production and technology	2.1	2.4	3.4	4.7	4.1	4.7	7.6	5.0	2.9	6.7	4.0	5.0	31.4	29.3	9.3	7.2	—	—	3.5	4.2
7. Industrial production and technology	11.0	11.6	12.9	11.7	19.3	20.6	10.9	9.4	16.6	11.3	6.6	8.6	20.6	24.9	19.0	18.0	—	—	11.5	11.8
8. Social structures and relationships	3.7	2.4	1.5	1.4	1.6	1.4	5.8	3.8	(12.2)	5.2	0.8	0.7	8.2	8.0	(6.7)	2.9	—	—	(2.5)	1.7
9. Exploration and exploitation of space	4.3	3.9	4.5	5.8	4.6	7.3	3.9	2.5	5.1	6.7	1.9	2.3	1.2	1.6	3.3	3.4	—	—	3.8	4.4
10. Research financed from general university funds	32.1	33.0	26.3	{ 10.3 16.2	31.8	{ 21.5 5.5	51.5	{ 47.0 9.8	(29.6)	{ 36.5 11.4	27.7	{ 14.6 5.1	21.0	{ 19.0 2.3	(34.6)	{ 35.1 15.4	—	—	32.9	{ 21.5 10.6
11. Non-oriented research	9.2	11.4			1.3	1.1	1.1	3.9												
12. Other research	—	—	1.5	1.0																
Total financing of civil R&D	91.6	90.2	70.3	68.7	93.9	91.1	97.0	96.9	99.6	99.5	50.0	50.4	100.0	100.0	99.8	99.8	—	—	75.7	75.2
13. Defence	8.4	9.8	29.7	31.3	6.1	8.9	3.0	3.1	0.4	0.5	50.0	49.6	—	—	0.2	0.2	—	—	24.3	24.8
Total financing	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Directorate-General for Science, Research and Development.

annual average 2,3 % in real terms 1975-83, with a 0,9 % increase for the civil component. Just over half of US GERD, estimated at USD 100 000 million in 1984, was financed directly by private industry. It is probable that in 1984 some seven or eight firms in data processing, telecommunications and advanced systems management spent over USD 500 million on R&D, with expenditures of the top two exceeding USD 2 500 million each, i.e. more than the total turnover of many fragmented Community firms in such sectors, or in excess of the total allocated to the Esprit programme over the five years of its existence (1 500 million ECU, 1984-88).

Gross expenditure on R&D in Japan in 1982, at yen 6 500 thousand million, equalled about 2,2 % of GDP. A low fraction, 2,5 %, of the public allocation was devoted to defence, while half was allocated to the Education Ministry for the general advancement of knowledge, but this presumably includes a certain amount of basic industrial research including new materials. Since 1975 GERD increased by 7,4 % in real terms annually.

It was in order to strengthen the Community's technological base and restore lost competitiveness that the Commission

proposed the launching of a true European technology community. This framework is compatible with and complementary to the French Government's Eureka initiative which was formally adopted by 17 European countries and the Commission on 17 July 1985.

Some existing programmes provide evidence of the positive results which can be achieved when European firms cooperate with each other: these include research programmes such as Esprit, industrial programmes such as Airbus and strategic programmes such as the European Space Agency. If Europe is to harness the new technologies to achieve its social and economic objectives then a genuine European technology community must: (i) exploit to the maximum the Community dimension of a continental market and network of research institutes, facilities, and common technical standards; (ii) promote the greatest possible synergetic effects from the interactions of national and Community programmes, possibly with an additional Community contribution and participation of non-member countries.

Among the main types of R&D projects which might be promoted are: (i) generic technologies such as microelectronics and optronics whose applications spread throughout the

industrial fabric, improving productivity and creating new product employment; (ii) development and exploitation of joint facilities for basic research, such as those already underway at CERN in Geneva and JET at Culham; and (iii) strategic technology-intensive programmes such as space exploration or telecommunications, where the 'critical mass' of the continental market is essential to commercial success. As Community-financed R&D programmes normally cover only the precompetitive phase, this initiative must be complemented by efforts to improve the market, fiscal, regulatory and social environment for entrepreneurship and innovation so as to encourage rapid commercial exploitation of results by Community firms.

6. Technological change and trade specialization

Trade theory provides powerful arguments in favour of free trade but does not take sufficient account of how knowledge as a factor can change competitive advantage. Policies adopted by trading partners to hasten technological change are having especially disruptive effects on the competitive prospects of the smaller Member States. Community exporters are losing competitive edge in the most technologically exigent markets.

Since the last world war the volume of international trade has grown at an even greater rate than that of world production. The GATT system is underpinned not just by fear of 1930s-style protectionism but by the intellectually-compelling arguments of international trade theory. This demonstrates how free trade and specialization with a minimum resort to tariff or quantitative restrictions is mutually advantageous for all participants.

It may be argued here that international trade theory does not take sufficient account of the role of intellectual capital as a factor of production, as a determinant of the fastest growing sectors of international trade, as the main determinant of structural change and of the inexorable shift of economic power from the North Atlantic littoral towards the Pacific basin.

One criticism of pure trade theory centres on the fact that economically useful knowledge is treated as a datum, as exogenously determined, which falls like manna from heaven and may be instantly and freely transferred among the community of partner nations. In Ricardian theory comparative costs are determined on the supply side by the relative overall productivity of factors of production in each country. The pattern of trade is thus determined by price differences between the partners. The more modern theory

of Heckscher-Ohlin-Samuelson emphasizes the variations between countries of endowment in the factors of production. This factor price equalization model presumes that the techniques of production are similar in each country and, since technology is presumed to be a free good, equally diffused internationally.

If it may be argued that since conventional theory focuses on secondary determinants, resulting policy orientation may become misdirected. A useful distinction may be drawn between the concept of comparative advantage and that of competitiveness. Comparative advantage, or specialization, is relative commercial strength of a sector compared with other sectors within the same economy. Competitive advantage is the relative strength of a firm relative to a competitor firm in another trading country. Following from this distinction, a firm may enjoy a comparative advance in its particular sector, but may remain at a competitive disadvantage in the international marketplace because the foreign competitor enjoys one or more incentives such as investment grants, government-financed R&D, undervaluation of the currency, low interest credits, non-tariff barrier protection. The dynamic objective of such inducements is to convert a competitive advantage into comparative advantage. This distinction is especially relevant to a sector based on accumulated knowledge, experiences economies of the learning curve, involves high-risk delayed-liquidity investment, and shares other characteristics of the lengthy innovation process (e.g. the development of a new high speed microprocessor or bioengineered enzyme). These are the main characteristics of those industries which have spearheaded the transfer of economic power towards the Pacific basin. They are based on know-how rather than on fixed natural resources. In an age when economic strength is based on accumulations of knowledge, a factor highly mobile internationally, some nation States have realized that by creating a social and economic environment conducive to knowledge and favourable to high-risk investment, a competitive advantage can be created for firms in related sectors by means of a range of State-sponsored inducements. Then, when the firms have achieved a level of comparative advantage over some or all of its competitors, these props may be removed or directed to even newer sectors. By stimulating the innovation absorption capacity (institutions, social and economic framework) of an economy the public authorities can foster the development, firstly of competitive advantage, then of structural competitiveness, leading on to comparative advantage. So, in a dynamic context and with increasing openness of world markets forcing the pace of technological progress, comparative advantage in high value-added sectors can be created by perceptive, long-term public policy. Contrariwise, the failure of public authorities to adapt sufficiently rapidly to the changing facts of economic life, by attempting to re-

vive technologically obsolescent sectors, by refusing to adopt the institutional framework to the new realities, weakens the structural competitiveness of an economy and leads directly to the increase of structural unemployment.

The competitiveness of a sector will also be advantaged if a national defence or space budget finances an R&D dual-use programme considered too risky for a firm under pure market conditions. This phenomenon is presently posing considerable difficulties for many Community economies in their attempts to define a long-term strategy for knowledge-intensive, high value-added sectors. They frequently find that in technologically dynamic sectors with mounting R&D threshold costs, they are being commercially pre-empted by foreign competitors, including US firms, enjoying government-finance through defence and space programmes. The competitiveness of the European civil aviation sector has been severely handicapped by the ability of US firms to transfer the fruits of federally-funded R&D for military aircraft to civilian models.

On the other hand, many Community members with very open trading markets face considerably higher risks investing in new sectors as compared with foreign competitors who enjoy scale economies of a larger domestic economy: this is especially the case in competition with Japan where a range of non-tariff barriers impedes import penetration of new products, thus greatly enhancing the effective scale of domestic market. It is the increasing realization of the difficulties faced by most member economies in entering innovative sectors based on global economies which has led to the adoption by the Commission of precompetitive collaborative research projects in information technology, telecommunications, biotechnology and basic industrial technology.

Evidence of the above developments is provided by the record. The share of the Community of Ten in total industrial world (OECD) high-tech trade, fell from 58 % in 1963 to 43 % in 1983; that of the US fell from 27 % to 21 %, while that for Japan rose from 5 % to 23 %. (This includes automobiles and machine tools due to recent R&D trends in these sectors.)¹ Excluding intra-Community trade, the EC figure fell from 35 % to 23 %, while that for EFTA countries fell from 8 % to less than 7 %. Although these figures do not include certain strategic items, high-tech service sectors such as software, nor allow for multinational ownership, they provide hard empirical evidence of the shift of competitiveness in new technology production towards the Pacific area.

¹ The full list was published in *European Economy* No 16 of July 1983. Although more selective than the strong-demand sectors in Chapter 1 the results of both calculations correspond.

Table 2 shows how the advanced-technology industries of the Community and other OECD countries performed from 1963 to 1983: here the performance of the total of high-tech sectors is related to an OECD average of 1.00, with the value of each country's high-tech exports weighted for its importance in total OECD manufacturing exports (e.g. if a country accounts for 5 % of total OECD manufacturing exports but 7 % of OECD high-tech exports its index is calculated as $7/5 = 1.4$). The table shows succinctly the seriousness of Europe's decline as a producer of knowledge-intensive exports — the score for some countries would be still lower if their record for total manufacturing, the weighting factor, was not even worse than that for the sectors retained.

Table 2

Evolution of comparative advantage¹ in high-technology trade 1963-83 (OECD average = 1.00)

COUNTRY	1963	1970	1978	1983
Belgium/Luxembourg	0.65	0.72	0.81	0.80
Denmark	0.65	0.70	0.63	0.58
France	0.93	1.00	0.96	0.84
Germany	1.20	1.06	0.99	0.97
Greece	0.07	0.07	0.16	0.13
Ireland	0.42	0.61	0.92	1.14
Italy	0.83	0.87	0.65	0.56
Netherlands	1.10	0.85	0.68	0.61
UK	1.02	0.94	0.92	0.91
EUR 10	1.01	0.94	0.88	0.82
USA	1.27	1.18	1.27	1.26
Japan	0.72	1.07	1.27	1.36
Canada	0.47	1.34	1.28	1.29
Spain	0.33	0.44	NA	²
Australia	0.46	0.57	0.60	0.47
Sweden	0.69	0.88	0.95	0.91
Switzerland	1.53	1.35	1.07	0.94
OECD: rest	0.24	0.31	0.24	0.30
OECD: total	1.00	1.00	1.00	1.00

¹ The index of comparative advantage (specialization) is calculated as follows:

$$\frac{X_{ij} / \sum X_j}{X_j / \sum X}$$

where X_{ij} = exports of product j by country i ; $\sum X_j$ = total world exports of product j ; X_j = total exports of manufactures by country i ; $\sum X$ = total world exports of manufactures.

² Data for Spain and Australia not available at time of calculation so not included in OECD totals for 1983.

Table 3 provides a bird's eye view of high-tech trade flows by direction. The Community exports to highly diversified world markets: the US (especially if one excludes aircraft and parts) and Japan concentrate more on the industrialized world. The net deficit of the EC with the US is evidenced — this would be even greater were services such as software and US-owned high-tech production facilities in Europe allowed for. The non-reciprocal nature of Japan's trading policies are also clearly evidenced.

7. Innovation and structural unemployment

In each economy the employment-potential of new technology is determined mainly by relative innovativeness and changing sectoral economies of scale. High-tech is not itself a major source of employment but its wealth-creating potential leads to high multiplier effects: long-run employment depends on maintenance of technological and commercial initiative *vis-à-vis* trading partners in a large range of sectors appropriate to the economy's size.

Here the effects of technology on employment rates are considered in isolation from such other major determinants as changes in demography and participation rates. Techno-

logical innovation is the main catalyst of structural embolism and growth in competitive economies, hence the main determinant of the long-term rate of employment and unemployment. In the short-run such change may lead to increased unemployment especially in the case of process innovation and replacement-product innovation. Where new product innovation and its multiplier effects on supplier and tertiary sectors does not come onstream to offer alternative employment the social effects will be severe especially if adequate training and education schemes are not provided. However, the global effects of the most recent industrial revolution would appear to be similar to those past — social disruptions during the structural change followed by a long-term increase in employment as the spin-off effects of the newly-innovated product sectors and their equipment, component and service suppliers more than counterbalance the earlier losses. According to a recent OECD report¹ 'new technologies have had little net effect on total employment in OECD countries as a whole. Although the evidence is inconclusive, it does suggest that recent technical change has had a small positive effect on overall employment'.

¹ *Technology and Employment, DSTI/DSTI/85.3*, OECD Paris, January 1985.

Table 3

High-tech trade flows by direction, 1963 and 1983¹

Reporter	Partner	EUR	EFTA	USA	Japan	USSR	Other CMEA ²	Arab OPEC ³	China	World
1963										
EUR		(22,6)	7,6	5,2	0,6	0,3	0,6	1,2	0,1	57,7
EFTA		3,0	—	0,9	0,2	0,1	0,2	0,2	0,1	7,8
USA		4,1	0,8	—	1,1	0,0	0,2	0,4	0,0	27,0
Japan		0,4	0,2	1,7	—	0,1	0,1	0,1	0,0	5,1
Total OECD		30,7	9,5	8,8	1,9	0,5	1,0	1,9	0,1	100,0
1983										
EC (10)		(20,1)	4,4	4,4	0,6	0,6	0,3	2,8	0,1	42,9
EFTA		2,5	—	1,2	0,1	0,2	0,1	0,5	0,0	6,5
USA		5,2	1,1	—	1,9	0,0	0,0	1,1	0,2	20,5
Japan		3,7	0,8	9,5	—	0,1	0,1	1,8	0,2	23,4
Total OECD		31,7	7,2	20,8	2,7	0,8	0,6	6,3	0,6	100,0

¹ As % of USD 15 980 million in 1963, as % of USD 252 630 million in 1983.

² DDR, Poland, Czechoslovakia, Hungary, Romania, Bulgaria.

³ Algeria, Libya, Iraq, Saudi Arabia, Yemen (North), Southern Yemen, Bahrain, Kuwait, Abu Dhabi, Dubai, Ras-al-Khaiman, Emirates, Qatar, Oman.

At the individual country level the effects vary greatly, but as a general rule there is a close correlation between rising levels of unemployment and falling levels of trade specialization in technology-intensive products. This would appear to be especially true for the smaller industrialized countries as the trend towards globalization seems to increasingly disadvantage smaller scale producers. So individual economies could be affected by two main factors, firstly a relative lack of innovativeness due to infrastructural, institutional and cultural factors and, secondly, the effects of new process technology on scale economies.

Where technological change affects scale economies and the relative competitiveness of firms and countries, it directly affects employment prospects. There would appear, *prima facie*, to be a contradiction between the claims of greater flexibility offered by new process technology and increased globalization of production. This dilemma might be resolved if we attempt to distinguish between the applicability of such new technologies as programmed automation to the following major sectoral groupings.

In the case of limited-differentiated products whose technology is inexorably advancing and for which demand is elastic, such as consumer electronics, information technology has led to increasing economies of scale and globalization of markets. In this case, a time-lead in market penetration is of the essence so as to reduce marginal cost ahead of other competitors. Although internal markets provide an important marketing base they never offer scale economies sufficiently large to allow a number of domestic competitors to achieve global scale, except possibly in the case of the large US internal market. Examples of such products are personal computers and their programmes, video tape recorders and digital audio systems.¹

In the case of products having a medium level of differentiation new process technology appears to have reduced economies of scale as information technology reduces the diseconomies of production flow discontinuities. The classical case is that of automobile production where different models may be further personalized to suit individual combination of optional extras. This development has greatly increased the competitiveness of some smaller-scale European producers whose future was considered in doubt before the real advantages of flexible manufacturing was realized.

In the case of highly-differentiated products characterized more by creativity and craft than technological know-how, the flexibility potential of the new technologies may revive the competitiveness of such traditional products, especially in high-wage economies. The symbiosis of data processing and transmission affords the prospect of increasing decentralization of production location, in parallel with rapid management information, since product transport costs are usually not a deciding factor under high differentiation. Typical example of such low-scale economy sectors are the *haute couture* textile, fashion, ceramics and silk enterprises of the Prato and other towns and regions in Italy, which specialize in highly-original, top-quality arts and crafts.

Where the demand for the products of these three classifications is elastic the absolute demand for factor inputs may increase though technological advances cause a relative increase in the productivity of labour and even of capital.² The potential for employment increase will be greatest in differentiated product sectors, less so or negative the more homogenous the product becomes, especially if technological operational standards force a considerable product uniformity. But the speed with which fully programmed automation and management systems (PAM) will be comprehensively diffused has been greatly exaggerated, as major problems of data communication between equipment and the great investment cost are underestimated. It is considered by industrial analysts that full PAM systems will only achieve widespread diffusion in the mid-1990s, though some highly innovative firms should succeed earlier. The employment effects in mature though technological advancing product sectors, such as automobile production, will probably be similar to that experienced by agricultural labourers with the introduction of mechanization at the turn of the century. Though the shedding of labour may continue for some years in firms which are not diversifying product range, it is possible that for some firms and countries the most intensive period of redundancies has passed.

For workers made redundant by firms which lack alternative opportunities at least three problems arise. Firstly, their existing qualifications and skills may mismatch those in alternative positions due to changing production technology;

¹ In the case of video-recorders it is estimated that internationally competitive production is in excess of 1 000 000 units per annum, a figure not achieved by any one Community producer but exceeded by a number of Japanese firms.

² The optimum rate of variable input usage depends, *inter alia*, on marginal productivity, elasticity of product demand, proportion of total costs accounted by each input, and the marginal substitutability of each factor input which determines the elasticity of input demand. Resource input decisions of the enterprise depend on competition conditions in the resource market so that if the marginal cost of factor labour is rising relative to the marginal cost of factor capital (in the long-run as a result of technological advance) then capital will tend to be substituted for labour and prospects of eliminating structural unemployment are retarded.

secondly, there may be a reduction in demand for low-skill workers in favour of highly-skilled technicians, or a 'skill-twist' as it has been dubbed in the US; thirdly, alternative employment may only become available in another location and institutional arrangement for accommodation purchase and rental in some countries militate greatly against residential transfer, as do restrictions on transfer of pension rights.

A concomitant of improving employment potential and thus of reducing structural unemployment must be the intensification of national training and retraining programmes for unemployed workers and constant in-house retraining for staff in competitive, innovative firms. In some sectors progress is retarded by a shortage of specialist skills, while women with considerable aptitudes in fields such as programming are subject to discrimination.

The direct employment potential of high-tech industry is quite low, probably only 3 % of manufacturing and 2 % of service employment in the most advanced countries. (In the US it is estimated that only 1,5 % of the 600 000 new businesses started in 1983 were in high-tech, while of a total of 16 million new non-farm jobs created between 1972 and 1983 the high-tech sectors accounted for 3 % to 14 % of the total depending on definition used.) But it is in the characteristic of high-tech industry as an originator of new wealth, intensive in human capital rather than raw materials and imported energy, that its real effects are witnessed as it stimulates the creation of other wealth-generating supply-sectors, revitalizes older industries and has multiplier effects in the wealth-distributing sectors. Many of these new activities are outlined in the Commission's proposal 'Towards a European technology community'. As was witnessed in the

past new sectors of activity unimagined at present by the business community should arise to outpace currently favoured winners, and generate further employment among component suppliers and distributors.

The social cost of the increasing rate of structural change is most distressing but the inexorable advance of technology, frequently pushed by the exigencies of defence and space programmes, seems beyond the capacity of any one nation to control, least of all those smaller economies most affected. Globalization of competitiveness poses an additional problem hence the importance of the Commission initiative to eliminate all internal Community trade barriers by 1992. Such Member States may hope to exploit niche sectors as have some smaller members in certain areas of biotechnology, but must remain ever wary that success in these areas will eventually entice market entry or takeover bids by established firms constantly seeking to diversify product range.

As long as the US strategic imperatives dictate government funding of frontier technologies with potential dual use and the protected nature of the Japanese market provide an invaluable launching pad for domestic innovators the prospects for smaller trading partners in wealth-creating, knowledge-intensive sectors remains doubtful. Europe's best hope of reducing structural unemployment lies in outlining a strategy which takes account of these two global factors, maximizes the potential of its pool of scientists and engineers by directing a greater proportion of its research efforts to employment potential programmes and evolves to show that a society which maintains its continued aspirations to civilized, caring standards can, and must, also become dynamic, competitive and innovative.

As the industrialized nations continue to invest in research and development, the gap between them and the developing countries is widening. This is especially true for the smaller industrialized countries as the cost of technology is falling. The industrialized nations are also investing in research and development in technology-intensive areas, which is particularly true for the smaller industrialized countries. The industrialized nations are also investing in research and development in technology-intensive areas, which is particularly true for the smaller industrialized countries. The industrialized nations are also investing in research and development in technology-intensive areas, which is particularly true for the smaller industrialized countries.

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Statistical annex

This statistical annex presents time series of annual data for the countries of the European Community, the United States and Japan, for the total of manufacturing industry and the following three sectoral groupings defined according to the NACE-CLIO classification of activities:

Strong-demand sectors:

electrical equipment and electronics; information technology, automated office equipment and precision instruments; chemicals and pharmaceuticals.

Moderate-demand sectors:

rubber and plastics; transport equipment; paper, pulp, packaging and printing; food, drink and tobacco; industrial machinery.

Weak-demand sectors:

textiles leather and clothing; steel and metal ores, metal goods; construction materials and non-metallic minerals, miscellaneous products.

The data for the European countries have been taken from Eurostat sources. Unless otherwise stated, the framework of definitions used for the data up to 1982, is that of the European system of accounts (ESA). The figures for 1983, 1984 and 1985 are estimates and forecasts made by the services of the Commission, based on the most recent data from national surveys following national definitions. Thus they are not always comparable with the ESA data for earlier years. Nevertheless every effort has been made to ensure the continuity of the series. Data for manufacturing industry are not available, on the ESA basis, for Greece and Ireland. The data for the United States and Japan are from national sources¹ but the original activity classifications have been adjusted by DG II to bring them into line with the NACE-CLIO nomenclature, and only those data compatible with the ESA definitions have been chosen for analysis.

¹ For the USA, Department of Commerce and Survey of current business; for Japan, National accounts.

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Table 1

Domestic demand (percentage growth rate)

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
	Total industry									
1972	5,2	4,7	2,5	6,2	4,2	-2,5	2,9	3,5		9,2
1973	14,6	15,8	5,1	8,4	18,2	14,9	19,1	11,3	17,0	19,0
1974	8,3	2,2	2,4	10,0	11,8	5,7	5,9	6,4	-1,9	0,9
1975	-7,7	-11,8	-4,0	-10,8	-10,7	-2,1	-3,5	-6,6	-8,3	-5,6
1976	12,1	15,4	8,8	8,5	13,2	9,3	2,9	8,5	9,6	12,7
1977	0,5	-0,5	-0,5	2,2	-1,2	10,5	1,8	1,1	8,7	5,4
1978	4,3	-0,7	0,1	1,7	0,8	3,7	1,8	1,3	7,6	3,3
1979	7,3	7,3	8,4	4,1	8,0	3,1	1,6	6,1	4,6	14,4
1980	-0,5	-2,3	2,1	2,8	9,0	-0,1	-14,3	-0,0	-4,6	14,7
1981	-4,0	-2,9	-1,8	-1,8	-4,6	-3,1	-5,3	-2,9	1,1	2,3
1982	0,4	1,5	-6,2	1,7	-1,7	2,8	1,0	-1,6	-4,8	4,7
1973/1982	2,9	1,4	1,6	2,3	3,5	3,8	-0,2	1,9	2,3	6,4
1983	-0,6	5,6	3,1	-1,2	-7,7	0,3	5,5	0,9	6,7	3,6
1984	2,9	8,8	3,4	1,1	4,8	5,8	4,7	3,4	9,9	10,2
1985	1,3	6,5	2,7	1,2	2,1	3,2	4,1	2,9	3,5	5,8
1982/1985	1,2	7,0	3,1	0,3	-0,4	3,1	4,8	2,4	6,7	6,5
	Strong demand									
1972	12,3	4,1	5,6	9,1	5,4	3,8	4,8	6,4		17,0
1973	20,2	26,5	10,5	14,4	19,2	17,9	23,5	15,2	14,4	23,5
1974	14,0	14,0	11,0	18,1	20,0	17,0	6,9	13,3	0,2	17,0
1975	-10,4	-13,3	-5,2	-8,2	-7,3	-9,0	-2,5	-6,1	-5,2	-11,7
1976	15,0	15,9	14,2	11,4	15,9	11,0	7,0	12,3	11,9	19,5
1977	6,6	2,2	4,6	2,9	-1,2	17,6	5,4	4,2	9,6	12,4
1978	7,7	-0,4	0,3	7,1	11,3	9,7	6,4	5,3	9,4	9,0
1979	17,1	11,6	12,4	5,5	8,5	1,4	3,1	8,7	9,0	21,4
1980	-4,7	1,0	2,6	4,4	12,6	-1,2	-13,1	1,0	-0,6	32,5
1981	1,0	-4,0	2,6	3,0	-3,3	6,2	1,8	1,7	3,9	10,7
1982	3,0	-0,8	-3,8	4,2	3,2	-5,7	4,5	0,6	-1,3	10,6
1973/1982	6,0	3,9	4,9	5,7	7,1	6,1	2,9	5,2	4,8	13,5
	Moderate demand									
1972	4,5	2,7	0,2	4,4	4,3	-5,1	2,4	1,8		5,5
1973	9,7	13,8	2,9	7,7	17,8	18,3	19,0	10,6	18,1	20,4
1974	3,8	3,9	-0,2	7,7	6,0	3,7	9,9	4,9	-0,8	1,1
1975	-1,9	-10,5	-2,0	-9,3	-10,3	1,8	0,7	-4,1	-5,3	-1,9
1976	6,7	11,5	8,8	6,7	9,8	9,0	1,0	6,8	6,9	6,9
1977	1,2	1,7	-2,8	2,9	-0,4	11,2	0,9	0,6	8,3	3,0
1978	4,7	0,6	1,8	1,5	2,7	1,3	-0,0	1,5	7,4	3,4
1979	5,9	4,1	8,3	4,0	5,6	5,1	0,5	5,2	3,6	13,4
1980	-1,1	-1,3	-0,0	2,8	7,9	-1,0	-10,6	-0,4	-4,6	7,8
1981	-3,0	-1,8	0,4	-0,0	-1,6	0,6	-6,7	-1,5	-1,2	-0,0
1982	4,2	1,8	-5,2	3,5	-1,5	0,7	0,3	-0,7	-1,4	1,3
1973/1982	2,5	1,6	1,4	2,3	2,8	4,4	0,3	1,9	2,3	4,8
	Weak demand									
1972	3,3	8,3	3,6	6,3	3,4	-2,3	4,5	4,0		8,6
1973	18,9	14,7	4,6	6,2	19,1	10,3	13,3	9,5	17,2	14,6
1974	11,2	-5,9	1,0	8,8	14,8	5,4	-0,5	5,2	-3,9	-6,8
1975	-14,3	-13,2	-5,1	-15,2	-13,5	-7,4	-9,5	-10,4	-12,6	-4,6
1976	17,9	22,6	6,0	10,1	15,9	8,2	4,6	9,0	8,3	14,1
1977	-3,5	-5,6	-0,7	-0,0	-1,4	4,8	1,0	-0,0	7,9	3,7
1978	1,0	-3,2	-2,0	-2,1	-5,8	3,0	2,4	-1,5	6,5	-1,4
1979	4,5	11,1	6,1	3,1	10,7	0,6	2,6	5,6	3,4	10,9
1980	3,0	-5,8	4,2	2,9	9,6	2,2	-19,5	0,4	-6,7	9,0
1981	-8,4	-4,2	-7,1	-7,3	-8,4	-6,5	-3,7	-7,0	2,2	-2,8
1982	-6,6	2,1	-8,8	-2,0	-5,2	-3,3	-0,5	-4,9	-11,6	1,2
1973/1982	1,4	-0,1	-0,1	-0,1	2,6	1,4	-2,1	0,2	0,5	3,0

(1) Average annual growth rate (1972-73)/(1981-82); 1982-1985

Table 2

(Production - Exports) as percentage of domestic demand

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
Total industry										
1972	47,3	62,1	85,4	82,7	84,8	51,1	82,3	92,1	93,9	95,8
1973	44,4	60,2	85,1	81,6	83,4	50,0	78,8	91,3	93,7	95,1
1974	42,1	58,9	84,8	79,4	82,5	45,7	75,9	90,6	92,7	94,4
1975	42,7	59,2	84,2	81,5	84,8	48,2	79,4	91,4	93,5	95,0
1976	39,5	57,5	82,8	79,1	83,1	46,6	77,3	90,6	92,9	95,1
1977	38,5	58,9	82,2	78,6	83,1	48,1	76,9	90,3	92,8	95,6
1978	37,8	58,8	81,8	78,5	82,4	46,9	76,4	90,1	91,4	95,9
1979	34,3	59,3	80,9	77,2	80,4	41,3	75,1	89,5	91,3	94,8
1980	27,3	59,2	79,5	76,8	80,4	39,3	74,6	88,7	90,7	94,6
1981	23,9	57,0	78,6	76,2	80,4	38,3	76,5	88,6	90,5	95,0
1982	19,6	56,3	77,8	75,1	80,3	38,9	75,6	88,5	90,5	94,8
1973/1982	-24,1	-4,5	-7,1	-6,5	-3,8	-11,9	-4,5	-3,2	-3,3	-0,5
1983	14,7	57,3	77,3	74,8	80,5	33,7	72,6	88,0	90,3	95,1
1984	8,1	56,8	75,8	73,8	79,5	30,7	69,5	87,3	89,1	95,1
1985	7,2	57,3	74,9	73,2	78,7	28,7	67,4	87,0	88,8	95,0
1982/1985	-12,4	1,0	-2,9	-1,9	-1,6	-10,2	-8,2	-1,5	-1,7	0,2
Strong demand										
1972	29,1	32,1	82,4	74,4	76,0	22,2	78,9	90,7	94,4	96,3
1973	27,6	32,1	81,5	73,0	73,6	24,0	73,8	90,0	93,7	95,8
1974	18,1	30,2	81,0	70,0	72,6	20,3	66,7	89,1	92,7	95,0
1975	22,6	30,2	80,2	72,7	75,9	17,9	74,5	89,5	93,5	95,4
1976	19,8	28,9	78,6	69,2	72,9	14,5	70,6	88,6	92,2	95,1
1977	23,8	29,1	78,3	68,6	71,5	22,5	70,9	88,2	92,2	95,5
1978	22,0	27,9	77,1	67,6	70,4	22,9	70,2	87,3	90,7	95,8
1979	20,7	28,9	75,8	66,3	66,5	9,8	68,2	86,7	90,7	94,9
1980	13,0	26,0	73,6	66,1	66,0	1,7	69,4	85,5	90,2	94,9
1981	10,7	23,9	71,7	64,5	63,6	2,4	66,9	83,8	89,8	95,2
1982	8,0	22,1	70,5	62,2	63,0	-0,1	65,8	83,0	89,8	94,8
1973/1982	-19,0	-9,1	-10,8	-10,3	-11,5	-21,9	-10,0	-6,9	-4,2	-1,1
Moderate demand										
1972	55,7	72,6	87,6	84,7	85,7	63,5	84,6	93,4	94,3	96,1
1973	52,2	70,5	87,9	83,9	84,4	62,1	82,5	92,9	94,1	96,0
1974	51,5	70,7	87,9	82,6	84,7	59,8	81,0	92,6	93,2	95,0
1975	53,3	68,9	86,8	84,2	85,0	62,4	82,7	93,1	94,1	95,3
1976	48,6	67,4	85,8	82,1	83,7	62,1	82,0	92,7	93,7	95,7
1977	48,0	69,2	85,0	81,8	83,6	61,4	81,3	92,3	93,6	96,2
1978	48,5	69,6	85,0	82,1	82,7	60,1	80,5	92,4	92,6	96,5
1979	46,1	71,4	84,9	81,7	81,5	55,4	79,8	92,2	92,3	95,8
1980	42,9	73,1	83,9	81,6	81,0	56,5	80,4	91,9	91,7	95,4
1981	39,8	70,1	82,2	80,6	80,4	55,3	81,6	91,4	91,7	95,8
1982	35,7	70,5	81,6	79,9	81,1	56,0	80,4	91,5	91,9	95,9
1973/1982	-16,2	-1,2	-5,9	-4,0	-4,3	-7,1	-2,5	-1,7	-2,4	-0,2
Weak demand										
1972	44,0	59,2	84,4	84,0	87,4	47,3	80,6	91,1	93,0	95,2
1973	42,3	56,2	84,0	82,6	86,2	45,6	76,0	90,0	93,1	94,2
1974	42,1	54,3	83,6	80,3	84,3	40,8	72,6	89,0	91,9	93,7
1975	37,6	57,6	83,4	82,3	88,3	41,8	76,9	90,2	92,8	94,5
1976	37,0	55,0	81,6	80,0	86,8	39,3	73,0	89,0	92,1	94,7
1977	33,0	55,4	81,1	79,3	87,1	40,9	72,8	88,7	91,8	95,0
1978	30,7	54,5	80,7	79,1	87,1	39,8	73,3	88,7	90,1	95,4
1979	25,4	53,7	79,3	76,7	84,9	36,6	70,8	87,4	90,2	94,1
1980	13,7	51,3	77,9	75,9	85,3	32,8	68,0	86,3	89,6	93,8
1981	8,5	49,9	78,3	76,3	86,9	32,2	73,8	87,4	89,2	94,4
1982	1,1	47,9	77,6	75,2	86,3	33,1	73,9	87,3	88,9	93,8
1973/1982	-38,3	-8,8	-6,3	-7,6	-0,2	-13,8	-4,4	-3,2	-4,0	-0,6

(1) Change (1981-82)-(1972-73); 1985-1982

Table 3

Total imports as percentage of domestic demand

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
	Total industry									
1972	52.7	37.9	14.6	17.3	15.2	48.9	17.7	7.9	6.1	4.2
1973	55.6	39.8	14.9	18.4	16.6	50.0	21.2	8.7	6.3	4.9
1974	57.9	41.1	15.2	20.6	17.5	54.3	24.1	9.4	7.3	5.6
1975	57.3	40.8	15.8	18.5	15.2	51.8	20.6	8.6	6.5	5.0
1976	60.5	42.5	17.2	20.9	16.9	53.4	22.7	9.4	7.1	4.9
1977	61.5	41.1	17.8	21.4	16.9	51.9	23.1	9.7	7.2	4.4
1978	62.2	41.2	18.2	21.5	17.6	53.1	23.6	9.9	8.6	4.1
1979	65.7	40.7	19.1	22.8	19.6	58.7	24.9	10.5	8.7	5.2
1980	72.7	40.8	20.5	23.2	19.6	60.7	25.4	11.3	9.3	5.4
1981	76.1	43.0	21.4	23.8	19.6	61.7	23.5	11.4	9.5	5.0
1982	80.4	43.7	22.2	24.9	19.7	61.1	24.4	11.5	9.5	5.2
1973/1982	24.1	4.5	7.1	6.5	3.8	11.9	4.5	3.2	3.3	0.5
1983	85.3	42.7	22.7	25.2	19.5	66.3	27.4	12.0	9.7	4.9
1984	91.9	43.2	24.2	26.2	20.5	69.3	30.5	12.7	10.9	4.9
1985	92.8	42.7	25.1	26.8	21.3	71.3	32.6	13.0	11.2	5.0
1982/1985	12.4	-1.0	2.9	1.9	1.6	10.2	8.2	1.5	1.7	-0.2
	Strong demand									
1972	70.9	67.9	17.6	25.6	24.0	77.8	21.1	9.3	5.6	3.7
1973	72.4	67.9	18.5	27.0	26.4	76.0	26.2	10.0	6.3	4.2
1974	81.9	69.8	19.0	30.0	27.4	79.7	33.3	10.9	7.3	5.0
1975	77.4	69.8	19.8	27.3	24.1	82.1	25.5	10.5	6.5	4.6
1976	80.2	71.1	21.4	30.8	27.1	85.5	29.4	11.4	7.8	4.9
1977	76.2	70.9	21.7	31.4	28.5	77.5	29.1	11.8	7.8	4.5
1978	78.0	72.1	22.9	32.4	29.6	77.1	29.8	12.7	9.3	4.2
1979	79.3	71.1	24.2	33.7	33.5	90.2	31.8	13.3	9.3	5.1
1980	87.0	74.0	26.4	33.9	34.0	98.3	30.6	14.5	9.8	5.1
1981	89.3	76.1	28.3	35.5	36.4	97.6	33.1	16.2	10.2	4.8
1982	92.0	77.9	29.5	37.8	37.0	100.1	34.2	17.0	10.2	5.2
1973/1982	19.0	9.1	10.8	10.3	11.5	21.9	10.0	6.9	4.2	1.1
	Moderate demand									
1972	44.3	27.4	12.4	15.3	14.3	36.5	15.4	6.6	5.7	3.9
1973	47.8	29.5	12.1	16.1	15.6	37.9	17.5	7.1	5.9	4.0
1974	48.5	29.3	12.1	17.4	15.3	40.2	19.0	7.4	6.8	5.0
1975	46.7	31.1	13.2	15.8	15.0	37.6	17.3	6.9	5.9	4.7
1976	51.4	32.6	14.2	17.9	16.3	37.9	18.0	7.3	6.3	4.3
1977	52.0	30.8	15.0	18.2	16.4	38.6	18.7	7.7	6.4	3.8
1978	51.5	30.4	15.0	17.9	17.3	39.9	19.5	7.6	7.4	3.5
1979	53.9	28.6	15.1	18.3	18.5	44.6	20.2	7.8	7.7	4.2
1980	57.1	26.9	16.1	18.4	19.0	43.5	19.6	8.1	8.3	4.6
1981	60.2	29.9	17.8	19.4	19.6	44.7	18.4	8.6	8.3	4.2
1982	64.3	29.5	18.4	20.1	18.9	44.0	19.6	8.5	8.1	4.1
1973/1982	16.2	1.2	5.9	4.0	4.3	7.1	2.5	1.7	2.4	0.2
	Weak demand									
1972	56.0	40.8	15.6	16.0	12.6	52.7	19.4	8.9	7.0	4.8
1973	57.7	43.8	16.0	17.4	13.8	54.4	24.0	10.0	6.9	5.8
1974	57.9	45.7	16.4	19.7	15.7	59.2	27.4	11.0	8.1	6.3
1975	62.4	42.4	16.6	17.7	11.7	58.2	23.1	9.8	7.2	5.5
1976	63.0	45.0	18.4	20.0	13.2	60.7	27.0	11.0	7.9	5.3
1977	67.0	44.6	18.9	20.7	12.9	59.1	27.2	11.3	8.2	5.0
1978	69.3	45.5	19.3	20.9	12.9	60.2	26.7	11.3	9.9	4.6
1979	74.6	46.3	20.7	23.3	15.1	63.4	29.2	12.6	9.8	5.9
1980	86.3	48.7	22.1	24.1	14.7	67.2	32.0	13.7	10.4	6.2
1981	91.5	50.1	21.7	23.7	13.1	67.8	26.2	12.6	10.8	5.6
1982	98.9	52.1	22.4	24.8	13.7	66.9	26.1	12.7	11.1	6.2
1973/1982	38.3	8.8	6.3	7.6	0.2	13.8	4.4	3.2	4.0	0.6

(1) Change (1981-82)-(1972-73); 1985-1982

Table 4

Imports extra as percentage of domestic demand

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
Total industry										
1972	12,6	18,7	5,8	5,6	5,5	12,9	11,9	8,0	4,5	3,6
1973	13,6	20,2	6,2	6,1	6,0	13,6	13,8	8,7	4,6	4,1
1974	15,3	20,7	6,4	7,3	6,3	15,0	15,0	9,4	5,5	4,8
1975	13,9	20,0	6,6	6,4	5,5	14,5	12,2	8,6	4,9	4,3
1976	14,9	20,4	7,3	7,2	6,1	15,1	13,2	9,4	5,6	4,2
1977	14,9	19,7	7,7	7,5	6,1	15,4	13,1	9,7	5,7	3,7
1978	15,1	19,2	7,9	7,4	6,4	15,6	13,3	9,9	6,6	3,4
1979	17,0	18,7	8,4	8,2	7,3	17,6	13,7	10,5	6,7	4,3
1980	21,0	19,2	9,5	8,8	7,4	19,0	14,5	11,3	7,2	4,6
1981	22,8	21,1	10,3	9,3	7,2	20,5	12,5	11,4	7,6	4,2
1982	22,6	19,9	10,6	9,6	7,2	20,6	12,5	11,5	7,5	4,5
1973/1982	9,6	1,0	4,5	3,5	1,5	7,3	-0,3	3,2	3,0	0,5
Strong demand										
1972	12,9	28,2	6,9	7,9	6,6	20,3	11,6	9,3	4,2	2,5
1973	12,3	29,4	7,2	8,3	7,2	18,8	14,1	10,0	4,8	2,9
1974	15,6	30,3	7,1	9,5	7,5	21,0	16,9	10,9	5,4	3,5
1975	14,6	31,1	7,8	8,8	7,4	21,6	13,3	10,5	4,8	3,3
1976	16,2	30,8	8,8	10,0	8,1	22,5	14,4	11,4	6,0	3,6
1977	16,1	29,0	9,1	10,7	8,9	21,8	13,8	11,8	6,0	3,3
1978	17,9	28,9	10,2	11,3	9,7	22,5	14,4	12,7	7,2	3,1
1979	18,1	27,6	10,5	12,1	10,6	27,1	14,8	13,3	7,2	3,8
1980	20,7	29,3	12,1	13,0	11,2	31,0	15,1	14,5	7,7	3,9
1981	21,8	31,7	13,6	14,1	12,9	35,4	16,6	16,2	8,3	3,8
1982	21,3	31,4	14,3	15,5	12,7	36,7	17,3	17,0	8,3	4,1
1973/1982	9,0	2,8	6,9	6,6	5,9	16,5	4,1	6,9	3,8	1,3
Moderate demand										
1972	8,4	13,5	4,6	5,2	4,5	11,1	9,2	6,6	4,2	3,2
1973	8,8	14,7	4,7	5,7	5,0	12,1	10,0	7,1	4,2	3,3
1974	10,0	15,4	4,8	6,7	4,7	12,1	10,6	7,4	5,0	4,1
1975	9,3	14,7	4,9	5,6	4,3	11,6	9,0	6,9	4,3	3,9
1976	9,4	14,9	5,2	6,2	4,7	11,1	9,4	7,3	4,8	3,5
1977	9,2	14,9	5,6	6,5	4,6	11,3	9,6	7,7	4,9	3,0
1978	8,8	14,3	5,6	6,2	5,2	11,7	9,7	7,6	5,5	2,6
1979	10,3	13,2	5,7	6,4	5,6	13,4	9,3	7,8	5,7	3,3
1980	12,4	13,1	6,4	6,6	5,6	13,5	9,8	8,1	6,1	3,7
1981	14,4	16,1	7,9	7,1	5,6	14,6	8,8	8,6	6,3	3,4
1982	14,5	14,0	7,7	7,1	5,4	14,3	8,9	8,5	6,2	3,3
1973/1982	5,8	0,9	3,2	1,7	0,7	2,9	-0,8	1,7	2,1	0,1
Weak demand										
1972	18,2	22,9	6,6	5,2	6,1	11,9	15,6	8,9	5,2	4,4
1973	19,9	25,1	7,1	5,6	6,6	13,2	19,0	10,0	5,2	5,3
1974	20,7	24,6	7,7	7,0	7,3	15,7	20,6	11,0	6,2	5,8
1975	20,0	23,4	7,7	6,4	5,9	15,1	16,7	9,8	5,7	5,0
1976	21,5	24,5	9,0	7,0	6,6	17,5	19,0	11,0	6,5	4,9
1977	21,8	23,9	9,3	7,4	6,5	18,3	18,8	11,3	6,6	4,5
1978	22,6	23,4	9,3	7,2	6,2	18,0	18,8	11,3	7,9	4,1
1979	25,7	23,8	10,2	8,6	7,6	18,7	20,5	12,6	7,9	5,4
1980	33,0	25,2	11,5	9,8	7,6	20,9	22,2	13,7	8,6	5,7
1981	35,7	25,0	11,3	9,7	6,7	21,1	16,5	12,6	8,8	5,1
1982	36,8	25,1	11,8	9,8	7,0	21,5	15,8	12,7	9,0	5,6
1973/1982	17,2	1,1	4,7	4,4	0,5	8,7	-1,2	3,2	3,7	0,6

(1) Change (1981-82)-(1972-73); 1985-1982

Table 5

Exports as percentage of production

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
	Total industry									
1972	56,6	36,3	20,1	18,6	18,3	49,8	18,8	11,1	5,4	9,4
1973	58,9	36,0	21,8	19,5	16,9	50,8	20,4	11,5	6,1	8,5
1974	60,8	38,9	24,6	22,0	18,5	55,9	23,1	13,4	8,0	11,2
1975	59,6	40,1	23,9	22,1	19,6	52,9	21,8	13,5	8,3	11,9
1976	62,1	37,6	25,1	22,6	20,2	54,8	23,7	13,5	8,0	12,6
1977	62,9	37,6	25,7	24,2	22,2	51,5	24,6	14,3	7,4	12,7
1978	63,4	38,6	25,7	24,0	23,7	52,2	24,4	14,2	7,7	11,5
1979	66,3	38,7	25,9	25,4	24,1	58,2	24,1	13,8	8,6	11,3
1980	73,0	42,0	27,0	24,7	21,8	60,7	26,0	14,4	10,1	12,9
1981	76,9	46,5	29,2	26,0	24,5	63,6	23,5	15,9	9,9	14,1
1982	81,3	46,3	31,3	25,7	24,5	63,5	23,2	16,0	9,1	14,2
1973/1982	21,4	10,3	9,3	6,8	6,9	13,2	3,7	4,6	3,7	5,2
1983	86,2	45,7	30,4	26,7	25,6	68,3	24,0	16,0	8,0	13,8
1984	92,4	45,5	32,3	28,6	26,1	71,4	26,2	16,9	7,8	14,5
1985	93,5	44,8	33,7	29,6	27,0	73,5	27,9	17,4	7,7	14,8
1982/1985	12,2	-1,5	2,4	3,9	2,5	10,0	4,7	1,4	-1,4	0,6
	Strong demand									
1972	71,6	58,0	30,4	26,0	24,9	82,4	26,2	16,5	8,0	12,5
1973	73,4	55,9	32,3	27,7	24,1	81,1	29,0	16,9	9,3	11,6
1974	82,7	59,6	34,3	31,1	27,8	85,1	37,6	19,6	12,1	13,4
1975	78,7	59,5	32,5	30,2	25,5	86,3	32,2	18,9	11,5	14,5
1976	81,7	60,2	34,2	32,0	26,3	89,2	35,4	19,4	11,6	16,3
1977	78,4	61,2	34,1	33,8	29,8	82,2	35,3	20,2	11,1	16,3
1978	80,4	62,6	35,0	34,5	28,0	81,8	34,6	20,2	11,9	15,5
1979	80,1	61,6	35,1	36,6	31,5	92,6	35,1	19,9	13,4	15,5
1980	87,7	67,0	36,8	35,4	29,0	98,7	35,9	20,5	14,9	16,4
1981	89,9	71,0	38,7	37,1	33,8	98,2	35,2	22,4	14,4	17,8
1982	92,4	73,5	40,4	37,7	34,1	100,1	34,9	22,7	13,6	17,8
1973/1982	18,7	15,2	8,3	10,5	9,4	17,4	7,5	5,9	5,4	5,7
	Moderate demand									
1972	42,0	35,8	21,5	17,6	15,8	40,2	16,9	10,9	6,1	10,7
1973	44,8	36,0	23,1	18,2	14,8	41,2	17,3	11,3	6,8	10,0
1974	45,1	37,8	25,3	19,9	16,2	43,6	18,6	12,8	8,7	13,1
1975	44,5	39,9	25,4	21,4	17,8	41,2	19,3	13,5	9,2	13,7
1976	49,2	36,7	26,5	22,0	18,6	42,4	19,4	13,4	9,0	14,8
1977	49,7	35,7	27,7	23,1	20,0	39,9	19,8	13,9	8,1	15,6
1978	48,5	36,0	26,7	22,4	21,4	40,2	19,9	13,2	8,4	14,1
1979	51,0	35,8	26,5	23,4	21,0	44,2	19,3	12,7	8,9	13,5
1980	54,5	37,7	28,0	22,2	20,0	45,6	21,0	13,5	10,2	16,1
1981	59,5	42,1	30,6	23,4	21,7	49,0	19,8	15,0	10,6	17,6
1982	63,8	41,2	33,0	22,8	20,5	48,9	19,5	14,9	9,2	17,4
1973/1982	18,2	5,7	9,5	5,2	5,8	8,2	2,6	3,8	3,5	7,2
	Weak demand									
1972	66,0	27,9	12,9	16,3	18,4	43,2	17,8	8,6	2,6	6,9
1973	66,4	27,2	14,7	17,4	16,2	45,1	20,5	9,1	3,3	5,8
1974	65,7	30,9	18,1	20,0	17,2	50,4	22,2	10,8	4,4	8,8
1975	68,5	30,8	17,0	18,8	19,1	48,0	20,0	10,5	4,4	9,0
1976	67,6	28,8	17,5	18,5	19,4	50,2	24,0	10,3	4,1	8,7
1977	70,5	30,6	17,8	20,6	21,5	47,6	26,3	11,5	3,6	8,3
1978	72,5	33,0	18,4	20,8	24,3	48,9	25,4	12,0	3,8	7,1
1979	77,1	34,0	18,9	22,0	24,4	53,0	25,8	11,8	4,6	7,2
1980	87,2	40,1	19,3	22,2	21,0	56,8	28,1	12,0	6,3	8,0
1981	92,2	45,0	20,6	23,3	24,0	59,9	22,0	13,2	5,1	8,3
1982	99,0	44,8	22,1	22,9	25,2	59,1	21,4	13,4	4,7	8,7
1973/1982	29,4	17,4	7,5	6,2	7,3	15,4	2,6	4,5	1,9	2,1

(1) Change (1981-82)-(1972-73); 1985-1982

Table 6
Share of total OECD exports

	B	DK	D	F	I	NL	UK	EUR 10	USA	JAP
Total industry										
1972	5.81	1.51	17.20	8.73	6.51	5.33	9.13	26.78	15.43	11.02
1973	6.02	1.57	18.75	9.01	5.78	5.44	8.46	26.80	15.43	10.53
1974	5.66	1.46	18.47	8.66	5.84	5.47	7.89	27.25	16.23	11.92
1975	5.26	1.56	17.45	9.47	6.39	5.29	8.41	28.26	16.81	11.26
1976	5.35	1.44	17.76	9.03	6.11	5.42	7.86	26.50	16.34	12.20
1977	5.36	1.40	18.12	9.20	6.59	5.20	8.50	27.90	15.16	12.96
1978	5.40	1.37	18.04	9.06	6.97	5.07	8.78	27.62	14.85	13.02
1979	5.35	1.37	18.08	9.64	7.33	5.19	8.87	27.04	15.26	11.38
1980	5.25	1.37	17.47	9.35	6.93	5.01	9.45	27.25	16.35	12.43
1981	4.63	1.37	16.25	8.74	6.85	4.62	8.00	26.65	17.92	15.16
1982	4.58	1.38	17.25	8.50	7.02	4.73	7.86	26.61	17.20	14.62
1973/1982	-1.32	-0.16	-1.23	-0.25	0.79	-0.71	-0.87	-0.16	2.13	4.11
1983	4.70	1.46	17.04	8.58	7.28	4.95	7.53	26.60	16.85	15.94
Strong demand										
1972	4.38	1.13	20.17	8.07	5.54	7.21	8.96	28.08	17.63	13.15
1973	4.55	1.11	21.63	8.52	5.10	7.32	8.39	27.96	17.51	12.36
1974	4.60	1.08	20.97	8.34	5.46	7.90	8.46	28.80	17.98	11.99
1975	4.65	1.13	19.47	9.00	5.41	7.56	8.93	29.29	18.13	11.81
1976	4.61	1.08	19.81	8.54	4.96	7.54	8.24	27.67	18.16	13.61
1977	4.65	1.06	19.78	8.61	5.19	7.18	8.70	28.71	17.71	14.28
1978	4.67	1.01	19.58	8.61	4.77	6.94	8.93	28.13	17.36	14.68
1979	4.37	1.00	19.36	9.22	5.29	7.23	8.91	27.40	18.08	13.06
1980	4.33	0.99	18.49	8.93	4.83	6.79	9.35	27.00	19.18	14.18
1981	3.82	0.95	16.74	8.28	4.80	6.14	8.28	25.79	20.70	17.34
1982	3.72	1.00	17.07	8.09	4.85	6.16	8.39	25.75	20.91	16.53
1973/1982	-0.70	-0.14	-4.00	-0.11	-0.50	-1.12	-0.34	-2.25	3.24	4.18
1983	3.63	1.02	16.73	8.08	5.07	6.29	8.02	25.55	20.36	18.78
Moderate demand										
1972	4.05	2.00	17.69	8.70	5.47	4.90	8.98	26.99	18.88	9.20
1973	4.12	2.20	19.27	8.96	4.86	5.06	7.96	26.98	18.65	9.22
1974	3.66	2.07	18.40	8.42	4.91	4.80	7.51	27.05	19.96	10.70
1975	3.74	2.10	17.39	9.56	5.20	4.71	8.18	28.33	20.44	10.00
1976	3.95	1.89	18.06	9.31	4.91	4.84	7.36	26.71	19.66	11.01
1977	4.02	1.83	18.82	9.42	5.23	4.64	7.72	27.57	17.87	12.33
1978	4.03	1.80	18.64	9.27	5.75	4.48	8.09	26.83	17.53	12.74
1979	4.15	1.83	19.03	10.09	5.87	4.63	8.26	26.69	17.66	10.86
1980	3.95	1.80	18.54	9.56	5.91	4.59	9.04	27.66	18.26	12.24
1981	3.57	1.77	17.01	8.73	5.41	4.20	7.84	26.49	20.42	14.76
1982	3.68	1.75	18.57	8.48	5.31	4.33	7.57	26.32	19.12	13.98
1973/1982	-0.46	-0.34	-0.69	-0.22	0.19	-0.72	-0.76	-0.58	1.01	5.16
1983	3.77	1.82	18.25	8.56	5.55	4.54	6.87	25.80	18.54	15.30
Weak demand										
1972	9.76	1.08	13.90	9.35	8.94	4.38	9.52	25.35	8.22	11.99
1973	10.08	1.03	15.53	9.50	7.72	4.38	9.25	25.53	8.90	10.93
1974	9.37	0.95	16.38	9.26	7.45	4.28	7.93	26.19	9.51	13.57
1975	8.30	1.05	15.72	9.76	9.24	4.20	8.32	27.23	9.66	12.85
1976	8.38	1.01	15.32	9.03	9.20	4.38	8.33	25.04	9.09	12.84
1977	8.29	1.02	15.35	9.40	10.23	4.24	9.59	27.65	8.18	12.74
1978	8.34	1.02	15.58	9.16	11.09	4.22	9.76	28.41	8.03	11.86
1979	8.18	1.04	15.37	9.37	11.58	4.02	9.76	27.23	8.81	10.53
1980	8.14	1.08	14.82	9.43	10.57	3.89	10.16	26.86	10.62	10.99
1981	7.40	1.14	14.37	9.26	11.70	3.69	7.97	27.89	10.42	13.43
1982	7.21	1.17	15.05	9.00	12.66	3.78	7.75	28.12	9.37	13.52
1973/1982	-2.62	0.10	-0.01	-0.29	3.84	-0.65	-1.52	2.57	1.34	2.02
1983	7.81	1.35	15.20	9.26	13.31	3.94	8.11	29.43	9.20	13.43

(1) Change (1981-82)-(1972-73); 1985-1982

Table 7

Share of intra EEC trade of total OECD exports

	B	DK	D	F	I	NL	UK	EUR 10	USA	JAP
	Total industry									
1972	4,37	0,63	8,11	4,80	3,33	3,77	2,65	28,15	3,58	1,42
1973	4,47	0,72	8,89	4,96	2,97	3,81	2,64	29,01	3,66	1,39
1974	4,02	0,62	8,31	4,58	2,68	3,75	2,51	27,01	3,56	1,37
1975	3,78	0,69	7,64	4,61	2,93	3,57	2,62	26,43	3,35	1,20
1976	4,02	0,64	8,18	4,49	3,01	3,71	2,72	27,35	3,40	1,45
1977	3,89	0,60	8,17	4,52	3,13	3,49	3,00	27,45	3,15	1,58
1978	3,94	0,64	8,30	4,64	3,36	3,42	3,08	28,07	3,20	1,60
1979	4,00	0,66	8,79	5,03	3,65	3,62	3,35	29,83	3,54	1,48
1980	3,82	0,67	8,43	4,73	3,36	3,43	3,48	28,66	4,08	1,64
1981	3,28	0,61	7,43	4,06	2,95	2,97	2,90	24,86	3,85	1,89
1982	3,27	0,64	8,09	3,92	3,22	3,09	2,85	25,82	3,77	1,78
1973/1982	-1,15	-0,05	-0,75	-0,89	-0,06	-0,76	0,23	-3,24	0,19	0,44
1983	3,35	0,65	8,04	4,03	3,36	3,13	2,79	26,13	3,80	2,01
	Strong demand									
1972	3,16	0,40	9,42	4,17	2,76	4,78	2,85	27,81	5,44	2,07
1973	3,32	0,41	10,33	4,49	2,58	4,88	2,84	29,15	5,25	2,12
1974	3,26	0,39	9,69	4,39	2,48	5,00	3,01	28,52	5,15	1,91
1975	3,28	0,37	8,74	4,34	2,53	4,80	3,05	27,46	5,02	1,80
1976	3,30	0,36	9,12	4,20	2,41	4,96	3,01	27,75	5,18	2,11
1977	3,30	0,37	8,87	4,15	2,28	4,54	3,23	27,24	5,05	2,27
1978	3,37	0,37	8,80	4,27	2,22	4,38	3,27	27,23	5,11	2,56
1979	3,19	0,37	9,21	4,71	2,31	4,72	3,74	28,88	5,39	2,42
1980	3,03	0,36	8,64	4,49	2,23	4,39	3,89	27,76	5,71	2,75
1981	2,63	0,34	7,64	4,03	2,07	3,47	3,40	24,30	5,73	3,25
1982	2,59	0,36	7,94	3,91	2,16	3,58	3,39	24,77	5,98	3,25
1973/1982	-0,63	-0,06	-2,08	-0,36	-0,56	-1,31	0,55	-3,95	0,51	1,16
1983	2,50	0,36	7,89	3,91	2,23	3,53	3,32	24,63	5,84	3,37
	Moderate demand									
1972	3,16	0,92	7,77	4,69	2,46	3,48	2,50	25,53	3,61	1,25
1973	3,15	1,13	8,46	4,79	2,25	3,51	2,38	26,24	3,80	1,24
1974	2,70	0,99	7,60	4,18	1,98	3,34	2,15	23,50	3,58	1,23
1975	2,76	1,07	7,01	4,44	2,04	3,12	2,30	23,39	3,22	1,04
1976	3,08	1,00	7,68	4,35	2,16	3,24	2,34	24,41	3,16	1,40
1977	3,04	0,90	8,01	4,46	2,27	3,10	2,58	24,99	2,83	1,63
1978	3,15	0,94	8,35	4,67	2,47	3,11	2,78	26,15	2,91	1,57
1979	3,30	0,98	9,11	5,10	2,76	3,29	2,92	28,17	3,17	1,39
1980	3,06	0,99	8,73	4,54	2,55	3,11	3,07	26,71	3,63	1,41
1981	2,70	0,87	7,55	3,74	2,08	2,81	2,62	22,88	3,66	1,66
1982	2,84	0,91	8,59	3,62	2,27	2,97	2,50	24,26	3,39	1,40
1973/1982	-0,38	-0,14	-0,04	-1,06	-0,18	-0,61	0,12	-2,32	-0,18	0,28
1983	2,96	0,91	8,45	3,79	2,41	3,00	2,39	24,47	3,38	1,71
	Weak demand									
1972	7,28	0,37	7,50	5,49	5,14	3,34	2,71	32,48	1,94	1,11
1973	7,40	0,37	8,32	5,62	4,36	3,35	2,85	33,00	2,09	0,99
1974	6,54	0,32	8,09	5,31	3,82	3,23	2,55	30,58	2,14	1,08
1975	5,91	0,34	7,69	5,13	4,75	3,21	2,76	30,50	2,07	0,94
1976	6,26	0,32	8,10	4,99	5,01	3,30	3,05	31,86	2,09	0,90
1977	5,87	0,34	7,75	4,99	5,38	3,11	3,47	31,74	1,85	0,85
1978	5,77	0,40	7,74	4,96	5,94	2,99	3,37	32,01	1,80	0,73
1979	5,87	0,44	7,90	5,23	6,34	3,05	3,63	33,32	2,28	0,71
1980	5,78	0,48	7,77	5,27	5,70	2,97	3,69	32,54	3,17	0,88
1981	5,02	0,48	6,97	4,64	5,49	2,69	2,84	28,96	2,07	0,78
1982	4,85	0,49	7,34	4,49	6,20	2,76	2,86	29,87	1,88	0,77
1973/1982	-2,41	0,11	-0,76	-0,99	1,09	-0,62	0,07	-3,33	-0,04	-0,27
1983	5,15	0,54	7,46	4,65	6,58	2,86	2,86	31,12	1,91	0,79

(1) Change (1981-82)-(1972-73); 1985-1982

Table 8

Rate of cover of imports by exports

	B	DK	D	F	I	NL	UK	EUR 10	USA	JAP
Total industry										
1972	1,17	0,93	1,47	1,09	1,25	1,04	1,08	1,44	0,87	2,35
1973	1,14	0,85	1,60	1,07	1,02	1,03	0,95	1,37	0,97	1,81
1974	1,13	0,91	1,81	1,09	1,07	1,07	0,94	1,49	1,09	2,14
1975	1,10	0,97	1,67	1,25	1,36	1,04	1,08	1,65	1,30	2,55
1976	1,07	0,82	1,61	1,11	1,25	1,06	1,06	1,50	1,14	2,81
1977	1,06	0,86	1,60	1,17	1,40	0,98	1,09	1,55	1,02	3,14
1978	1,05	0,90	1,56	1,15	1,45	0,96	1,05	1,51	0,89	3,03
1979	1,03	0,92	1,48	1,15	1,30	0,98	0,96	1,37	0,98	2,34
1980	1,01	1,05	1,44	1,09	1,14	1,00	1,03	1,32	1,10	2,60
1981	1,05	1,15	1,51	1,12	1,33	1,08	1,00	1,47	1,04	3,14
1982	1,05	1,11	1,59	1,04	1,32	1,11	0,94	1,46	0,96	3,00
1973/1982	-0,11	0,24	0,02	-0,00	0,19	0,06	-0,05	0,06	0,08	0,99
1983	1,07	1,13	1,49	1,08	1,42	1,10	0,84	1,40	0,81	3,09
1984	1,08	1,10	1,48	1,13	1,37	1,11	0,81	1,40	0,69	3,28
1985	1,11	1,09	1,52	1,15	1,36	1,11	0,80	1,41	0,66	3,27
1982/1985	0,06	-0,02	-0,07	0,11	0,04	0,00	-0,14	-0,05	-0,30	0,27
Strong demand										
1972	1,03	0,66	2,04	1,02	1,05	1,33	1,32	1,91	1,45	3,75
1973	1,05	0,60	2,09	1,03	0,89	1,35	1,15	1,83	1,52	3,03
1974	1,06	0,64	2,23	1,05	1,02	1,45	1,21	2,01	1,75	2,97
1975	1,08	0,64	1,94	1,15	1,08	1,37	1,38	1,99	1,88	3,55
1976	1,10	0,61	1,92	1,06	0,96	1,40	1,32	1,86	1,55	3,81
1977	1,13	0,65	1,87	1,11	1,06	1,34	1,33	1,90	1,49	4,11
1978	1,15	0,65	1,81	1,10	0,93	1,33	1,25	1,73	1,31	4,15
1979	1,05	0,65	1,69	1,13	0,91	1,36	1,16	1,62	1,52	3,37
1980	1,07	0,71	1,62	1,07	0,79	1,31	1,27	1,53	1,62	3,67
1981	1,07	0,77	1,60	1,07	0,89	1,34	1,10	1,49	1,49	4,24
1982	1,06	0,79	1,62	1,00	0,88	1,36	1,03	1,43	1,38	3,91
1973/1982	0,03	0,15	-0,45	0,01	-0,80	0,01	-0,17	-0,41	-0,05	0,69
1983	1,07	0,79	1,56	1,06	0,95	1,35	0,94	1,41	1,13	4,35
Moderate demand										
1972	0,91	1,48	1,95	1,19	1,13	1,17	1,11	1,74	1,07	2,94
1973	0,89	1,34	2,18	1,16	0,94	1,15	0,98	1,67	1,16	2,68
1974	0,87	1,46	2,45	1,18	1,07	1,15	0,97	1,83	1,30	2,85
1975	0,91	1,47	2,24	1,45	1,22	1,16	1,14	2,10	1,61	3,19
1976	0,92	1,20	2,19	1,30	1,17	1,21	1,10	1,95	1,46	3,91
1977	0,91	1,25	2,17	1,35	1,27	1,05	1,07	1,94	1,29	4,72
1978	0,89	1,29	2,06	1,32	1,31	1,01	1,03	1,85	1,14	4,57
1979	0,89	1,39	2,02	1,36	1,17	0,99	0,95	1,74	1,17	3,52
1980	0,90	1,64	2,02	1,27	1,07	1,09	1,09	1,77	1,26	3,98
1981	0,97	1,70	2,04	1,27	1,14	1,19	1,09	1,88	1,31	4,82
1982	0,98	1,68	2,18	1,18	1,10	1,22	0,99	1,89	1,15	4,93
1973/1982	0,08	0,28	0,05	0,05	0,09	0,04	-0,01	0,18	0,11	2,07
1983	1,01	1,67	2,01	1,20	1,23	1,17	0,85	1,77	0,96	4,72
Weak demand										
1972	1,52	0,56	0,80	1,02	1,57	0,68	0,90	0,96	0,36	1,48
1973	1,45	0,48	0,91	1,00	1,21	0,69	0,82	0,90	0,46	1,01
1974	1,39	0,53	1,12	1,02	1,11	0,70	0,76	0,99	0,52	1,43
1975	1,31	0,61	1,03	1,08	1,78	0,66	0,83	1,08	0,59	1,72
1976	1,22	0,49	0,94	0,91	1,58	0,65	0,86	0,93	0,49	1,68
1977	1,18	0,55	0,93	0,99	1,84	0,63	0,96	1,02	0,42	1,75
1978	1,17	0,59	0,94	0,99	2,16	0,63	0,93	1,07	0,36	1,59
1979	1,15	0,60	0,89	0,93	1,82	0,65	0,84	0,93	0,45	1,23
1980	1,08	0,71	0,84	0,90	1,54	0,64	0,83	0,85	0,58	1,32
1981	1,10	0,82	0,94	0,97	2,09	0,71	0,80	1,06	0,44	1,53
1982	1,13	0,75	0,98	0,90	2,11	0,72	0,77	1,06	0,39	1,45
1973/1982	-0,37	0,26	0,10	-0,08	0,72	0,03	-0,07	0,13	0,01	0,25
1983	1,14	0,82	0,91	0,95	2,20	0,72	0,72	1,04	0,33	1,37

(1) Change (1981-82)-(1972-73); 1985-1982

Table 9

Value-added at market prices (1975 prices) index: 1972 = 100

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
Total industry										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	109,9	105,5	105,4	106,8	110,8	110,4	109,3	107,6	111,0	113,9
1974	114,6	107,4	106,5	110,8	117,9	116,7	107,9	110,1	106,5	111,4
1975	106,1	104,5	101,7	108,9	106,4	106,0	100,5	104,2	99,0	106,1
1976	115,9	109,2	109,6	115,4	119,9	114,4	102,3	111,6	108,5	120,5
1977	117,2	110,2	112,3	120,1	122,5	115,1	104,3	114,4	115,7	129,6
1978	119,5	111,1	113,3	123,8	124,6	119,8	105,0	116,3	122,1	138,8
1979	125,1	118,7	117,8	127,1	133,0	123,8	104,7	120,3	125,5	153,8
1980	123,8	120,8	117,5	127,7	141,3	123,7	95,8	120,0	120,0	169,9
1981	121,1	119,8	116,0	126,0	140,0	120,0	89,7	117,5	123,0	180,1
1982	121,6	120,2	113,3	126,6	137,8	121,4	89,7	116,5	114,9	194,0
1973/1982	1,6	1,7	1,2	2,2	3,1	1,5	-1,7	1,3	1,3	6,4
1983	123,2	127,8	114,5	128,4	132,7	121,6	91,9	116,7	121,0	200,8
1984	128,6	135,6	119,0	130,8	137,7	127,7	95,2	120,9	130,9	223,1
1985	133,5	143,2	124,4	133,2	141,9	134,2	98,3	125,2	134,8	236,5
1982/1985	3,2	6,0	3,2	1,7	1,0	3,4	3,1	2,4	5,5	6,8
Strong demand										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	116,3	118,2	109,8	111,8	112,9	115,1	113,1	111,8	111,0	116,1
1974	126,5	123,6	123,4	122,7	122,2	132,9	117,1	122,8	108,4	117,2
1975	111,7	119,7	114,0	121,3	112,0	108,1	109,6	114,1	102,9	108,8
1976	128,8	133,2	126,7	130,7	125,8	125,0	114,4	125,5	113,7	133,8
1977	138,0	136,2	134,7	139,5	130,0	125,9	117,8	132,0	123,9	152,2
1978	148,9	137,9	134,0	147,4	138,9	134,4	121,8	136,0	133,7	181,1
1979	157,9	148,2	139,2	155,0	148,9	142,5	124,0	142,3	141,3	202,5
1980	151,0	156,7	138,4	152,6	160,3	137,8	117,9	141,5	141,5	244,4
1981	149,5	150,3	140,6	154,9	159,8	130,1	113,2	141,4	149,1	283,1
1982	149,7	159,6	138,3	156,6	166,6	136,7	115,3	142,6	143,2	328,5
1973/1982	3,7	4,0	3,2	4,4	4,9	2,4	0,8	3,3	3,7	12,2
Moderate demand										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	107,4	102,7	105,7	106,5	110,6	111,0	107,6	107,1	111,8	116,8
1974	111,6	110,4	103,8	108,7	116,0	114,5	107,9	108,1	106,1	118,4
1975	109,9	107,6	100,7	110,7	105,5	113,1	101,6	104,7	100,6	115,9
1976	115,2	107,8	111,1	118,1	116,2	119,5	102,6	112,0	110,1	127,5
1977	116,6	110,0	111,3	122,6	118,0	120,1	104,5	113,8	117,4	136,6
1978	118,9	111,7	114,2	126,4	121,7	123,5	105,3	116,6	122,0	138,0
1979	125,8	118,1	120,4	131,2	127,0	128,0	105,4	121,1	123,9	152,6
1980	123,9	122,2	120,5	133,3	134,7	130,2	100,4	121,6	116,9	165,4
1981	124,0	122,8	121,1	132,5	134,3	129,7	94,3	120,4	119,3	172,8
1982	128,2	122,0	120,1	134,7	130,8	130,9	93,6	120,2	114,2	179,5
1973/1982	2,2	2,1	1,8	2,9	2,6	2,4	-1,1	1,7	1,1	5,6
Weak demand										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	109,5	105,2	102,4	104,4	110,0	105,8	107,8	105,6	110,2	110,5
1974	112,2	96,1	99,7	106,6	117,8	107,3	101,3	105,6	106,4	103,3
1975	99,4	93,6	95,6	99,1	104,2	94,5	93,1	97,7	93,6	97,2
1976	110,5	102,0	97,2	103,9	119,6	99,4	95,1	103,2	101,8	108,6
1977	108,2	100,5	100,0	106,2	122,8	99,9	96,2	105,3	106,0	112,9
1978	106,8	99,8	99,6	106,7	120,4	103,5	95,3	104,8	112,5	118,4
1979	109,6	108,2	101,5	105,9	130,5	103,6	94,9	107,2	115,7	130,6
1980	111,3	104,6	101,1	107,2	139,0	103,8	78,7	106,4	108,8	136,5
1981	105,6	102,9	94,7	102,5	135,6	98,8	74,0	101,4	109,5	134,6
1982	102,5	102,0	90,5	101,4	130,4	96,6	73,6	98,5	94,9	138,4
1973/1982	-0,1	-0,0	-1,0	-0,0	2,7	-0,6	-3,7	-0,3	-0,3	2,9

(1) Average annual growth rate (1972-73):(1981-82); 1982:1985

Table 10

Total employment (percentage growth rate)

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
	Total industry									
1972	-1.4	2.3	-2.4	1.1	-1.1	-3.4	-3.4	-1.7	2.4	-0.4
1973	0.8	1.3	1.0	2.1	1.6	-1.6	0.5	1.1	5.7	4.1
1974	0.8	-3.3	-2.3	1.1	2.3	-0.3	0.6	0.0	-0.0	-1.0
1975	-6.0	-8.1	-5.5	-2.7	-0.2	-3.6	-5.1	-3.9	-8.5	-5.7
1976	-4.2	0.1	-2.7	-1.3	0.3	-4.2	-3.3	-2.1	3.7	0.9
1977	-3.9	-0.5	-0.6	-0.5	0.1	-2.7	0.8	-0.3	3.7	-0.0
1978	-4.0	-0.6	-0.4	-1.6	-0.8	-2.4	-0.6	-0.9	4.4	-0.9
1979	-2.7	-0.0	0.3	-1.8	0.3	-1.0	-1.3	-0.6	2.5	0.6
1980	-2.0	-5.1	0.3	-1.5	0.6	-1.1	-2.6	-0.9	-3.3	1.5
1981	-5.1	-4.6	-2.7	-3.5	-1.5	-3.0	-10.0	-4.5	-0.6	1.2
1982	-3.6	-0.3	-3.7	-1.7	-1.9	-4.3	-5.6	-3.3	-6.6	-0.3
1973/1982	-3.2	-2.4	-1.7	-1.3	0.1	-2.4	-2.7	-1.6	0.1	-0.2
1983	-2.5	-0.1	-4.2	2.3	2.9	-4.9	5.5	-3.7	2.0	2.1
1984	-0.2	-3.2	-0.6	-3.2	-3.9	-2.1	-1.5	-1.9	5.2	2.0
1985	-0.3	2.7	1.2	-2.7	-1.5	1.0	-0.6	-0.4	0.5	1.5
1982/1985	-1.0	1.9	-1.2	-2.9	-2.8	-2.0	-2.2	-2.0	1.2	1.9
	Strong demand									
1972	-3.4	5.4	-2.0	2.3	0.4	-3.4	-3.6	-1.4	2.4	0.6
1973	4.5	6.6	4.0	4.5	2.8		1.4	3.1	8.5	5.5
1974	5.3	-2.5	2.1	3.7	5.9	3.5	3.5	3.3	2.8	1.7
1975	-3.1	-10.6	-5.2	-1.1	0.5	-1.2	-5.8	-3.7	-7.9	-8.3
1976	-3.1	-0.3	-3.2	-0.7	0.4	-4.1	-4.1	-2.5	3.0	1.1
1977	-3.0	0.2	0.2	0.3	-0.5	-2.0	2.0	0.4	4.9	-1.0
1978	-2.0	1.3	-0.5	-0.5	-1.0	-2.3	0.2	-0.5	5.8	-1.4
1979	-0.9	-2.9	0.3	-0.7	-0.9	-0.8	-0.5	-0.4	4.7	1.9
1980	-1.5	-1.2	0.5	-0.9	-0.4	-0.1	-1.3	-0.4	-0.1	8.1
1981	-2.8	-10.7	-2.1	-2.5	-4.7	-1.4	-7.7	-4.0	0.4	3.7
1982	-3.1	-0.2	-4.1	-1.2	-3.3	-3.7	-4.6	-3.5	-4.3	-0.1
1973/1982	-1.2	-2.7	-0.9	-0.1	-0.1	-1.2	-1.8	-0.9	1.6	0.8
	Moderate demand									
1972	-1.0	1.4	-1.7	1.3	1.4	-2.2	-3.8	-1.3	2.3	-0.2
1973	1.7	1.2	1.0	2.6	2.5	-0.4	0.0	1.2	6.3	4.2
1974	-1.8	-0.8	-1.9	1.2	3.0	-0.0	1.2	0.3	-0.0	-0.4
1975	-4.4	-6.9	-4.4	-2.1	-0.7	-2.7	-3.9	-3.3	-7.2	-4.3
1976	-2.7	-0.4	-1.3	-0.2	0.1	-3.4	-2.4	-1.3	3.3	0.9
1977	-1.5	0.8	-0.4	0.2	0.1	-1.8	0.1	-0.2	4.4	0.9
1978	-1.2	-0.0	0.1	-0.6	-0.2	-1.7	0.5	-0.1	4.6	-1.0
1979	-0.5	0.9	1.3	-1.4	1.5	-0.0	-1.4	-0.1	3.3	0.1
1980	-0.6	-3.0	1.1	-1.1	1.3	-1.3	-1.5	-0.3	-3.4	-0.6
1981	-3.0	-1.7	-1.3	-2.7	-0.9	-2.1	-8.1	-3.5	-0.1	1.0
1982	-2.9	-1.4	-1.7	-1.2	-2.3	-3.0	-5.1	-2.7	-5.0	-0.5
1973/1982	-1.8	-1.3	-0.8	-0.7	0.5	-1.6	-2.0	-1.0	0.5	-0.2
	Weak demand									
1972	-0.7	2.5	-3.3	0.6	-2.8	-4.8	-2.7	-2.2	2.5	-0.9
1973	-1.0	-0.3	-0.5	0.9	0.9	-3.7	0.5	0.1	3.5	3.6
1974	0.8	-6.9	-5.1	0.1	1.1	-2.6	-1.4	-1.6	-1.6	-2.6
1975	-7.9	-8.7	-6.8	-3.9	-0.2	-6.1	-6.0	-4.5	-10.2	-5.7
1976	-5.6	1.0	-4.0	-2.5	0.3	-5.1	-3.7	-2.6	4.7	0.8
1977	-5.6	-2.6	-1.4	-1.4	0.3	-4.4	0.9	-0.8	2.4	-0.3
1978	-6.8	-2.2	-0.9	-3.1	-1.0	-3.6	-2.4	-2.0	3.3	-0.6
1979	-5.0	-0.3	-0.7	-2.6	-0.1	-2.5	-1.7	-1.3	0.5	0.5
1980	-3.4	-9.8	-0.7	-2.0	0.4	-1.6	-4.8	-1.8	-5.2	0.5
1981	-6.1	-4.0	-4.6	-4.7	-1.1	-5.5	-14.0	-5.7	-1.9	0.1
1982	-4.4	-2.5	-6.7	-2.5	-1.4	-6.6	-6.8	-4.3	-10.1	-0.2
1973/1982	-4.7	-3.9	-3.1	-2.3	-0.1	-4.1	-4.1	-2.5	-1.4	-0.7

(1) Average annual growth rate (1972-73) (1981-82); 1982/1985

Table 11

Total employment (absolute change from preceding year)

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
	Total industry									
1972	-15,3	12,5	-230,0	63,7	-63,0	-41,1	-272,0	-545,1	448,6	-61,6
1973	9,1	7,5	93,0	120,1	88,0	-18,5	36,0	335,2	1 089,4	599,3
1974	8,5	-18,6	-219,0	62,8	129,0	-3,1	47,0	6,6	-6,9	-153,7
1975	-66,9	-44,4	-507,0	-160,2	-12,8	-41,1	-400,0	-1 232,4	-1 716,9	-857,3
1976	-44,8	0,6	-236,0	-71,4	14,6	-46,2	-244,0	-627,2	694,2	124,4
1977	-39,0	-2,3	-55,0	-28,3	7,2	-28,8	55,0	-91,2	718,0	-7,0
1978	-38,8	-3,0	-35,0	-90,3	-43,0	-25,0	-45,0	-280,1	874,4	-124,6
1979	-25,4	-0,2	29,0	-97,3	15,0	-10,0	-96,0	-184,9	531,0	85,3
1980	-18,4	-25,4	26,0	-78,3	32,0	-11,0	-187,0	-262,1	-708,8	216,0
1981	-45,7	-21,7	-226,0	-185,3	-87,0	-30,0	-697,0	-1 292,7	-130,2	165,6
1982	-30,0	-1,3	-303,0	-87,7	-106,0	-41,0	-351,0	-920,0	-1 359,2	-40,7
1973/1982	-280,9	-111,9	-1 328,0	-631,1	46,0	-224,9	-1 724,5	-4 256,3	120,0	-272,0
1983	-19,0	-1,0	-336,0	-113,7	-158,0	-42,0	-328,0	-955,0	-362,0	240,0
1984	-1,0	14,0	-46,0	-149,0	-177,0	-17,0	-82,0	-466,0	936,0	235,0
1985	-2,0	12,0	92,0	-123,0	-64,0	8,0	-32,0	-109,0	94,0	180,0
1982/1985	-22,0	25,0	-290,0	-385,7	-399,0	-51,0	442,0	-1 530,0	668,0	655,0
	Strong demand									
1972	-5,4	3,7	-40,0	20,5	3,0	-8,2	-52,0	-78,4	88,9	15,0
1973	6,9	4,7	77,0	40,5	20,0		20,0	169,1	325,8	146,2
1974	8,4	-1,9	42,0	34,4	44,0	8,0	50,0	184,9	116,5	47,9
1975	-5,2	-7,9	-107,0	-10,5	4,3	-2,8	-86,0	-215,0	-338,1	-239,6
1976	-5,1	-0,2	-61,0	-6,7	3,3	-9,7	-57,0	-136,4	118,0	29,7
1977	-4,8	0,1	4,0	2,9	-4,2	-4,6	26,0	19,4	196,0	-27,0
1978	-3,0	0,9	-9,0	-4,9	-8,0	-5,2	3,0	-26,2	245,9	-37,5
1979	-1,3	-2,0	5,0	-6,4	-6,9	-1,8	-7,0	-20,4	209,9	50,5
1980	-2,2	-0,8	9,0	-8,4	-3,1	-0,1	-17,0	-22,7	-5,8	213,9
1981	-4,1	-6,9	-40,0	-23,5	-36,5	-3,1	-102,0	-216,1	20,6	105,4
1982	-4,4	-0,1	-75,5	-10,8	-23,9	-7,8	-57,0	-179,4	-204,1	-1,7
1973/1982	-16,1	-16,3	-156,2	-8,3	-9,1	-23,1	-208,5	-437,6	-623,9	215,5
	Moderate demand									
1972	-4,2	3,7	-63,0	28,9	22,0	-11,4	-140,0	-163,9	177,7	-11,9
1973	6,6	3,3	36,0	57,9	41,0	-2,2	1,0	143,6	498,5	209,5
1974	-7,3	-2,3	-73,0	26,1	50,0	-0,1	41,0	34,4	-0,5	-18,6
1975	-17,5	-19,5	-163,0	-48,8	-12,2	-13,6	-142,0	-416,6	-603,2	-222,0
1976	-10,1	-1,0	-45,0	-3,9	2,5	-17,1	-82,0	-156,6	255,6	45,2
1977	-5,6	2,2	-14,0	3,4	2,1	-8,9	2,0	-18,8	350,6	42,8
1978	-4,5	-0,1	2,0	-12,7	-4,0	-7,8	17,0	-10,2	382,2	-49,2
1979	-1,8	2,3	45,0	-31,8	24,9	-0,2	-46,0	-7,6	286,8	4,8
1980	-2,0	-8,0	37,0	-24,3	21,7	-5,9	-50,0	-31,5	-303,9	-30,6
1981	-10,7	-4,4	-46,0	-57,9	-16,4	-9,6	-266,0	-411,1	-12,9	50,5
1982	-10,0	-3,5	-58,1	-24,6	-39,4	-13,7	-156,0	-305,2	-439,4	-24,0
1973/1982	-61,2	-31,0	-268,0	-133,3	69,4	-71,2	-603,5	-1 098,8	384,4	-84,4
	Weak demand									
1972	-3,9	5,1	-127,0	14,3	-88,0	-21,2	-79,0	-299,7	181,9	-64,7
1973	-5,9	-0,6	-20,0	21,7	27,0	-15,8	13,0	19,5	265,2	243,5
1974	4,7	-14,4	-188,0	2,3	35,0	-10,7	-41,0	-212,1	-122,9	-183,0
1975	-44,1	-17,0	-237,0	-100,9	-6,0	-24,0	-169,0	-598,0	-775,5	-395,8
1976	-28,6	1,8	-130,0	-60,8	9,0	-19,1	-98,0	-325,6	320,5	49,5
1977	-27,4	-4,6	-45,0	-34,6	9,2	-15,6	24,0	-94,0	171,4	-22,7
1978	-31,2	-3,8	-28,0	-72,7	-30,0	-12,0	-62,0	-239,6	246,2	-37,8
1979	-21,6	-0,5	-21,0	-59,1	-3,0	-8,0	-43,0	-156,2	34,4	30,0
1980	-13,8	-16,6	-20,0	-45,6	13,4	-5,0	-120,0	-207,6	-399,1	32,7
1981	-23,9	-6,2	-140,0	-103,9	-34,1	-17,3	-330,0	-655,3	-137,9	9,7
1982	-16,3	-3,7	-194,6	-52,3	-42,7	-19,6	-138,0	-467,1	-715,6	-14,9
1973/1982	-197,0	-63,3	-916,3	-490,6	-14,4	-129,4	-901,5	-2 712,3	-888,2	-403,1

(1) Change (1981-82)-(1972-73); 1985-1982

Table 12

Observed labour productivity (Index: 1972 = 100)

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
	Total industry									
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	109.0	104.1	104.4	104.5	109.0	112.1	108.8	106.4	105.1	109.3
1974	112.8	109.6	107.9	107.3	113.3	118.9	106.7	108.9	100.8	108.1
1975	111.0	116.0	109.1	108.5	102.6	112.0	104.7	107.3	102.3	109.2
1976	126.7	121.0	120.8	116.4	115.2	126.2	110.2	117.3	108.1	123.0
1977	133.2	122.7	124.6	121.8	117.6	130.4	111.5	120.6	111.2	132.2
1978	141.5	124.5	126.2	127.6	120.6	139.1	112.9	123.8	112.4	142.9
1979	152.3	133.0	130.7	133.4	128.3	145.2	114.1	128.9	112.7	157.4
1980	153.8	142.6	130.0	136.0	135.6	146.7	107.2	129.7	111.5	171.3
1981	158.6	148.1	132.0	139.0	136.4	146.8	111.6	133.1	115.0	179.5
1982	165.1	149.2	133.8	142.1	136.9	155.2	118.2	136.5	115.0	193.9
1973/1982	5.0	4.3	3.0	3.6	3.0	4.0	1.1	3.0	1.3	6.6
1983	171.6	158.7	141.2	140.9	128.1	163.5	114.7	142.0	118.7	196.6
1984	179.5	173.9	147.5	148.3	138.3	175.4	120.6	149.9	122.1	214.1
1985	186.8	178.8	152.4	155.2	144.7	182.5	125.3	155.8	125.1	223.6
1982/1985	4.2	6.2	4.4	3.0	1.9	5.6	2.0	4.5	2.8	4.9
	Strong demand									
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	111.3	110.8	105.6	107.0	109.8	115.1	111.5	108.4	102.2	110.1
1974	115.0	119.0	116.2	113.2	112.2	128.4	111.5	115.2	97.1	109.3
1975	104.7	128.9	113.3	113.1	102.3	105.7	110.8	111.3	100.1	110.6
1976	124.7	143.9	130.0	122.8	114.5	127.4	120.7	125.4	107.5	134.6
1977	137.7	146.8	137.9	130.7	118.9	131.0	121.9	131.5	111.7	154.7
1978	151.6	146.7	137.9	138.8	128.3	143.2	125.7	136.2	113.9	186.7
1979	162.2	162.5	142.9	147.0	138.8	153.1	128.7	142.9	115.0	204.8
1980	157.4	173.8	141.3	146.0	150.0	148.2	123.9	142.7	115.2	228.7
1981	160.3	186.6	146.7	151.9	157.0	141.9	128.9	148.7	120.9	255.5
1982	165.6	198.6	150.5	155.4	169.1	154.8	137.7	155.3	121.4	296.7
1973/1982	4.9	6.9	4.2	4.5	5.0	3.6	2.6	4.3	2.0	11.3
	Moderate demand									
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	105.7	101.5	104.7	103.8	107.9	111.5	107.6	105.9	105.2	112.0
1974	111.8	110.1	104.9	104.7	109.8	115.0	106.6	106.6	99.8	114.0
1975	115.2	115.2	106.4	109.0	100.6	116.7	104.6	106.8	102.0	116.6
1976	124.1	115.9	118.9	116.4	110.7	127.7	108.1	115.8	108.0	127.1
1977	127.5	117.3	119.6	120.7	112.2	130.8	110.0	117.8	110.4	135.0
1978	131.6	119.1	122.7	125.2	116.0	136.7	110.3	120.7	109.7	137.7
1979	140.1	124.9	127.6	131.8	119.4	141.8	112.0	125.5	107.9	152.2
1980	138.7	133.1	126.4	135.4	125.0	146.0	108.2	126.4	105.4	166.0
1981	143.1	136.2	128.7	138.3	125.8	148.6	110.7	129.6	107.6	171.7
1982	152.5	137.3	129.8	142.3	125.4	154.6	115.7	132.9	108.5	179.2
1973/1982	4.1	3.5	2.6	3.6	2.1	4.1	1.0	2.7	0.6	5.8
	Weak demand									
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	110.6	105.5	102.9	103.5	109.1	110.0	107.3	105.4	106.4	106.7
1974	112.5	103.5	105.6	105.6	115.5	114.5	102.3	107.1	104.4	102.3
1975	108.2	110.5	108.6	102.2	102.3	107.4	100.0	103.8	102.2	102.2
1976	127.3	119.2	115.0	109.8	117.1	119.0	106.0	112.6	106.2	113.3
1977	132.1	120.5	120.1	113.9	119.9	125.1	106.3	115.8	108.1	118.3
1978	139.9	122.3	120.6	118.0	118.7	134.4	107.8	117.5	110.9	124.7
1979	151.2	133.0	123.7	120.3	128.8	138.0	109.3	121.9	113.6	137.0
1980	158.9	142.5	124.1	124.2	136.6	140.4	95.3	123.1	112.7	142.4
1981	160.5	146.0	121.9	124.6	134.7	141.5	104.2	124.3	115.6	140.2
1982	163.2	148.4	124.9	126.5	131.3	148.3	111.2	126.2	111.5	144.4
1973/1982	4.9	4.1	2.2	2.4	2.7	3.6	0.4	2.2	1.1	3.6

(1) Average annual growth rate (1972-73)/(1981-82); 1982/1985

Table 13

Price index of value-added (1972 = 100)

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
Total industry										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	103,8	109,4	105,0	107,2	113,1	101,3	100,4	106,3	100,4	108,9
1974	117,3	121,6	112,6	119,5	137,1	110,5	109,8	118,1	109,2	129,4
1975	122,9	139,3	117,5	135,0	163,0	117,2	139,9	132,6	123,8	131,0
1976	127,5	150,0	119,9	147,7	192,7	123,1	161,7	143,2	128,7	131,8
1977	132,6	161,3	124,7	157,7	224,2	124,4	191,7	154,8	136,7	133,2
1978	135,0	172,8	129,9	170,5	252,5	123,8	217,3	165,5	144,7	136,5
1979	136,2	179,1	132,7	187,2	290,0	122,2	243,0	177,1	153,0	135,5
1980	140,7	195,8	137,4	210,4	340,7	127,4	288,9	195,2	165,5	132,9
1981	146,3	213,0	141,3	233,3	386,7	133,2	320,8	210,3	178,7	133,3
1982	157,8	239,2	149,1	264,1	454,7	132,8	349,5	229,4	186,3	130,3
1973/1982	4,6	8,9	3,9	10,2	16,5	3,1	14,4	8,8	6,9	2,6
Strong demand										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	99,4	99,7	101,6	103,2	112,4	102,2	97,1	103,8	100,3	100,0
1974	109,1	110,3	110,9	114,9	132,3	113,6	101,0	115,3	107,9	107,5
1975	121,3	127,0	114,5	121,8	153,0	116,3	132,5	126,5	121,3	112,1
1976	121,3	130,6	114,1	129,8	178,9	119,1	148,9	133,8	127,2	109,1
1977	124,3	134,9	115,9	139,1	197,3	117,8	176,5	142,3	135,4	105,3
1978	119,5	145,9	118,5	143,8	212,8	114,0	197,6	147,9	140,1	101,1
1979	119,3	151,4	120,2	159,6	237,6	112,9	217,2	156,5	145,6	97,4
1980	128,4	161,7	122,2	179,1	260,6	117,4	261,9	169,6	159,6	88,9
1981	136,2	182,2	125,1	194,6	290,4	121,1	277,5	179,3	170,9	85,1
1982	150,0	208,6	130,5	215,5	325,7	128,3	309,1	194,2	181,5	80,2
1973/1982	4,1	7,8	2,7	8,1	12,6	2,4	12,9	7,0	6,5	-2,1
Moderate demand										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	102,5	113,1	106,1	108,0	109,1	98,2	99,7	105,4	99,1	105,0
1974	112,4	122,4	111,9	118,3	133,2	104,2	106,9	115,1	105,4	123,9
1975	127,1	142,2	119,6	137,1	162,4	115,8	132,7	131,7	122,0	132,3
1976	133,0	157,2	123,6	152,9	189,9	120,9	161,0	144,7	126,3	136,5
1977	138,7	169,8	131,3	164,0	222,1	122,4	192,2	158,3	133,8	142,3
1978	143,6	181,4	137,2	180,1	251,2	122,7	216,9	170,4	141,3	147,9
1979	143,8	189,1	139,2	196,2	288,4	120,0	243,3	181,8	149,6	142,9
1980	148,1	208,3	144,8	220,5	340,3	126,3	279,0	200,2	160,9	145,0
1981	155,0	230,4	148,6	245,9	384,1	129,6	319,3	217,7	176,6	152,6
1982	166,0	255,9	157,8	277,0	461,6	133,8	348,6	238,1	184,8	155,4
1973/1982	5,3	9,6	4,5	10,8	16,8	3,2	14,4	9,3	6,9	4,6
Weak demand										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	107,3	107,7	105,7	108,7	117,1	103,9	106,8	109,3	102,3	117,7
1974	126,5	125,5	114,3	124,3	142,4	113,9	123,9	124,0	115,1	148,9
1975	119,4	139,8	116,7	142,5	169,1	119,4	160,7	138,6	128,6	142,0
1976	125,3	147,1	119,0	153,4	202,7	129,1	172,8	147,7	134,5	142,1
1977	131,0	159,8	122,6	163,5	238,2	132,6	202,9	159,0	144,3	143,8
1978	135,6	171,1	128,7	179,7	274,3	133,8	232,8	172,1	155,6	153,3
1979	138,6	175,9	133,4	199,1	317,9	134,1	256,6	185,7	165,8	158,9
1980	140,2	191,5	138,9	221,9	379,0	137,6	321,7	206,3	178,3	161,0
1981	143,4	196,3	144,3	248,0	438,3	137,9	337,3	221,5	189,7	163,3
1982	153,9	223,8	152,2	284,7	521,5	144,5	362,2	243,5	194,9	162,4
1973/1982	4,1	8,1	4,1	11,0	18,0	3,7	14,5	9,3	7,4	4,6

(1) Average annual growth rate (1972-73)/(1981-82); 1982/1985

Table 14

Earnings per head deflated by price of GDP (1972 = 100)

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
Total industry										
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	107.9	104.0	104.8	102.2	109.7	108.1	107.7	105.8	101.6	108.3
1974	115.9	113.7	109.6	102.4	114.1	114.3	108.4	109.0	101.4	112.6
1975	118.0	116.4	111.2	114.5	118.7	115.3	114.4	113.7	102.7	119.4
1976	131.6	119.6	119.8	120.0	124.7	118.7	116.3	119.7	106.1	123.6
1977	133.5	120.7	125.6	124.7	125.6	120.8	113.9	122.5	108.9	128.8
1978	139.1	120.0	128.5	129.4	126.1	123.1	117.9	125.6	109.8	131.2
1979	143.5	124.7	131.8	130.8	126.6	126.2	120.6	128.1	110.4	137.4
1980	151.1	132.4	135.2	135.9	125.1	126.6	114.8	129.6	111.4	142.9
1981	154.1	131.8	137.6	138.3	126.9	125.2	116.0	131.6	111.6	148.7
1982	155.3	130.4	137.9	142.3	126.3	126.7	120.3	133.7	111.8	153.2
1973/1982	4.5	2.8	3.3	3.7	2.1	2.1	1.4	2.9	1.1	4.2
1983	156.2	135.9	137.7	142.6	125.0	129.6	122.5	134.3	114.9	161.3
1984	160.1	135.4	139.9	143.1	126.7	125.7	128.1	136.4	116.9	168.8
1985	163.3	135.4	141.6	145.8	129.3	126.2	131.5	138.7	117.5	175.8
1982/1985	1.7	1.3	0.9	0.8	0.8	-0.1	3.0	1.2	1.7	4.7
Strong demand										
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	108.1	104.1	104.8	99.5	111.3	109.2	107.4	106.2	100.3	106.9
1974	113.8	114.3	111.5	99.2	111.8	115.5	105.3	109.6	99.8	109.4
1975	116.4	119.2	113.9	108.4	114.3	115.5	114.6	113.6	102.9	116.8
1976	130.2	121.5	122.8	113.5	119.4	119.0	116.6	120.5	105.9	120.9
1977	133.8	122.1	128.4	119.2	117.9	122.7	113.8	123.7	107.3	127.4
1978	140.1	122.0	130.8	119.0	118.0	125.4	119.6	125.9	107.7	131.3
1979	140.8	129.0	134.7	124.5	117.1	128.2	121.4	128.7	107.9	136.8
1980	150.8	139.0	136.0	127.9	114.7	128.3	116.3	128.4	110.0	134.6
1981	152.8	139.5	140.1	126.1	116.0	128.8	118.4	129.9	110.7	141.0
1982	155.9	135.7	140.8	130.8	117.0	131.1	123.2	132.9	113.6	148.6
1973/1982	4.5	3.4	3.6	2.9	1.1	2.4	1.7	2.7	1.3	3.8
Moderate demand										
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	107.9	103.4	105.6	104.1	106.6	106.9	108.3	105.9	101.6	108.7
1974	120.2	113.1	109.7	105.0	108.4	112.4	108.4	108.7	100.5	113.1
1975	124.8	116.8	112.1	118.0	114.6	113.9	113.0	114.2	101.4	119.7
1976	138.4	119.3	120.7	124.9	119.3	116.8	114.4	120.2	105.2	125.2
1977	138.5	119.5	126.2	130.3	119.7	117.8	112.5	122.9	108.2	129.5
1978	142.1	118.5	129.1	136.9	120.6	119.4	115.8	126.3	108.6	132.3
1979	144.8	122.4	132.8	139.1	119.7	122.3	119.9	129.5	108.6	139.5
1980	151.8	127.9	137.8	147.6	117.0	122.3	115.5	132.5	109.5	148.6
1981	153.5	125.2	138.9	155.3	118.1	122.3	144.8	134.9	109.1	154.5
1982	154.4	126.4	137.7	159.1	116.7	124.5	118.0	136.7	109.2	159.4
1973/1982	4.5	2.4	3.4	4.9	1.4	2.0	1.2	3.1	0.9	4.6
Weak demand										
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	107.5	104.7	103.5	101.4	111.3	108.5	107.1	105.1	102.3	108.6
1974	113.5	113.1	107.3	100.7	118.9	114.8	110.1	108.2	103.2	113.7
1975	112.9	112.6	106.9	112.8	123.1	115.1	115.8	112.2	103.4	120.6
1976	125.9	118.0	115.0	116.7	130.6	118.7	118.1	117.6	106.7	123.6
1977	127.6	120.5	121.0	119.6	133.1	120.9	115.1	119.9	109.8	128.9
1978	133.7	119.6	124.0	124.5	133.2	123.8	118.8	122.9	111.5	130.1
1979	140.5	124.7	126.3	122.2	135.5	127.2	119.9	124.1	112.7	135.6
1980	146.9	133.9	128.7	124.0	135.5	128.2	111.5	124.6	112.5	142.6
1981	147.5	133.2	130.9	122.0	138.2	127.9	114.5	125.8	112.7	147.6
1982	147.7	132.9	129.8	125.1	137.9	130.2	120.1	127.4	109.9	149.8
1973/1982	4.0	3.0	2.8	2.3	3.0	2.4	1.4	2.4	1.1	4.0

(1) Average annual growth rate (1972-73) (1981-82); 1982-1985

Table 15

Real unit labour costs (1972 = 100)

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
	Total industry									
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	99.0	99.9	100.4	97.8	100.6	96.4	99.0	99.4	96.6	99.0
1974	102.7	103.8	101.6	95.4	100.6	96.2	101.6	100.0	100.6	104.1
1975	106.3	100.3	101.9	105.5	115.7	103.0	109.3	106.0	100.4	109.4
1976	103.9	98.8	99.2	103.0	108.2	94.1	105.5	102.1	98.1	100.5
1977	100.2	98.4	100.8	102.4	106.8	92.6	102.1	101.5	98.0	97.4
1978	98.3	96.5	101.8	101.5	104.6	88.5	104.4	101.4	97.7	91.8
1979	94.2	93.8	100.8	98.1	98.7	86.9	105.6	99.4	97.9	87.2
1980	98.3	92.9	104.0	99.9	92.3	86.3	107.1	99.9	99.9	83.4
1981	97.1	89.0	104.3	99.5	93.1	85.3	104.0	98.9	97.0	82.8
1982	94.0	87.4	103.0	100.1	92.3	81.6	101.8	98.0	97.2	79.0
1973/1982	-0.4	-1.4	0.4	0.1	-0.9	-1.8	0.4	-0.1	-0.1	-2.3
1983	91.0	85.6	97.5	101.2	97.6	79.3	106.8	94.6	96.8	82.0
1984	89.2	77.9	94.8	96.5	91.6	71.7	106.2	91.0	95.7	78.8
1985	87.4	75.7	92.9	93.9	89.4	69.2	104.9	89.0	93.9	78.6
1982/1985	-2.4	-4.7	-3.4	-2.1	-1.1	-5.4	1.0	-3.1	-1.1	-0.2
	Strong demand									
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	97.1	93.9	99.2	93.0	101.3	94.9	96.3	97.9	98.1	97.0
1974	98.9	96.1	96.0	87.6	99.6	90.0	94.4	95.1	102.8	100.1
1975	111.1	92.5	100.5	95.9	111.8	109.2	103.4	102.1	102.7	105.5
1976	104.4	84.5	94.4	92.4	104.3	93.4	96.6	96.0	98.5	89.8
1977	97.2	83.2	93.1	91.2	99.2	93.6	93.3	94.1	96.1	82.4
1978	92.4	83.1	94.8	85.7	92.0	87.5	95.1	92.5	94.5	70.3
1979	86.8	79.4	94.3	84.7	84.3	83.7	94.3	90.1	93.8	66.8
1980	95.8	80.0	96.2	87.6	76.5	86.6	93.9	90.0	95.5	58.8
1981	95.3	74.7	95.5	83.0	73.9	90.8	91.9	87.4	91.6	55.2
1982	94.1	68.3	93.6	84.1	69.2	84.7	89.5	85.6	93.6	50.1
1973/1982	-0.4	-3.3	-0.6	-1.6	-3.7	-1.2	-0.9	-1.5	-0.7	-6.7
	Moderate demand									
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	102.1	101.9	100.9	100.3	98.9	95.8	100.7	100.0	96.5	97.1
1974	107.5	102.8	104.6	100.3	98.7	97.7	101.6	102.0	100.8	99.2
1975	108.3	101.3	105.4	108.3	113.9	97.6	108.1	106.9	99.4	102.6
1976	111.5	103.0	101.5	107.2	107.8	91.5	105.9	103.9	97.3	98.4
1977	108.6	101.9	105.5	108.0	106.6	90.1	102.3	104.4	98.1	95.9
1978	107.9	99.5	105.3	109.4	103.9	87.3	105.0	104.6	99.1	96.0
1979	103.4	98.0	104.1	105.5	100.3	86.3	107.1	103.2	100.6	91.7
1980	109.4	96.1	109.0	109.1	93.6	83.7	106.7	104.8	104.0	89.5
1981	107.2	91.9	107.9	112.3	93.9	82.3	103.8	104.1	101.4	90.0
1982	101.3	92.1	106.9	111.8	93.0	80.5	102.0	102.8	100.7	88.9
1973/1982	0.3	-1.0	0.7	1.3	-0.7	-2.0	0.3	0.4	0.3	-1.1
	Weak demand									
1972	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1973	97.2	99.3	100.6	97.9	102.1	98.7	99.8	99.7	96.1	101.8
1974	100.9	109.3	101.6	95.4	103.0	100.3	107.7	101.0	99.8	111.1
1975	104.4	101.9	98.4	110.4	120.3	107.3	115.8	108.1	101.2	118.0
1976	98.9	99.0	100.0	106.2	111.5	99.8	111.4	104.4	100.5	109.1
1977	96.6	100.0	100.8	105.0	111.0	96.7	108.3	103.6	101.6	109.0
1978	95.5	97.8	102.8	105.5	112.3	92.1	110.2	104.6	100.6	104.3
1979	92.9	93.8	102.1	101.6	105.2	92.2	109.7	101.9	99.3	99.0
1980	92.4	94.0	103.7	99.8	99.2	91.3	117.0	101.2	99.8	100.1
1981	91.9	91.2	107.3	97.9	102.6	90.4	110.0	101.2	97.5	105.3
1982	90.5	89.5	103.9	98.9	105.0	87.8	108.0	101.0	98.6	103.7
1973/1982	-0.9	-1.1	0.6	-0.1	0.3	-1.2	1.0	0.1	-0.0	0.4

(1) Average annual growth rate (1972-73):(1981-82); 1982-1985

Table 16

Adjusted labour share

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
	Total industry									
1972	71.7	79.6	72.9	75.8	79.4	68.2	75.1	74.7	70.8	53.5
1973	72.8	80.3	74.4	74.6	77.2	69.3	74.7	74.6	72.0	54.5
1974	75.0	84.7	74.6	72.1	74.6	69.4	79.7	74.7	74.9	58.1
1975	83.8	80.6	75.6	80.3	83.1	78.0	83.9	79.7	71.9	65.1
1976	84.3	80.4	74.6	78.6	78.4	73.4	82.5	77.7	71.5	63.3
1977	83.7	80.9	75.4	79.7	79.8	75.7	77.1	77.8	71.2	64.1
1978	84.0	81.1	76.1	79.7	78.7	76.6	77.0	77.9	72.1	61.6
1979	83.1	81.7	76.8	77.7	74.2	77.9	80.5	77.7	74.3	60.6
1980	87.8	80.1	79.2	79.4	71.9	79.0	82.3	79.0	76.7	60.7
1981	87.0	78.1	80.1	80.5	75.9	76.4	81.5	80.0	75.3	61.7
1982	83.7	75.5	78.6	82.2	74.9	75.7	78.9	79.0	77.1	61.2
1973/1982	13.1	-3.1	5.7	6.2	-2.9	7.3	5.3	4.9	4.8	7.4
	Strong demand									
1972	64.6	74.1	72.2	70.7	73.4	60.7	68.1	70.3	67.3	41.3
1973	66.8	77.1	75.3	68.7	71.7	60.6	68.4	71.1	69.5	44.8
1974	70.0	80.5	71.2	64.5	69.1	55.5	73.3	68.8	73.7	51.9
1975	77.1	75.9	76.3	75.8	77.8	73.4	77.6	76.4	71.4	56.6
1976	78.2	73.4	74.6	75.2	74.1	66.8	74.2	74.2	69.0	52.6
1977	76.2	76.1	75.1	75.6	76.6	72.1	69.2	74.3	67.0	52.9
1978	78.2	77.0	77.8	75.6	74.5	73.4	70.2	75.5	68.5	49.2
1979	76.6	76.1	79.1	74.5	70.9	73.2	73.1	75.6	71.1	49.8
1980	82.2	77.8	82.4	77.4	70.9	77.0	72.4	77.6	72.2	49.4
1981	80.8	71.3	82.8	78.0	73.0	72.7	74.8	78.3	70.6	49.5
1982	77.6	63.0	81.5	80.7	71.7	73.1	70.1	77.0	72.4	48.6
1973/1982	13.5	-8.4	8.4	9.6	-0.2	12.2	4.2	6.9	3.1	6.0
	Moderate demand									
1972	68.6	81.1	73.2	75.5	79.4	70.9	73.8	74.2	68.0	54.2
1973	72.7	80.7	74.0	75.6	77.4	72.2	79.1	75.4	70.0	56.1
1974	78.1	84.8	77.4	75.8	73.5	76.2	80.6	77.0	74.6	58.6
1975	78.7	81.2	76.4	80.0	79.5	77.2	85.3	79.2	69.4	61.2
1976	82.0	81.4	73.1	77.5	76.2	74.2	82.2	76.3	69.4	60.5
1977	82.0	81.1	74.1	79.1	77.2	75.9	76.1	76.2	69.9	59.8
1978	81.7	81.1	73.6	79.0	75.7	77.4	75.8	75.8	71.8	60.2
1979	81.4	82.4	74.7	77.7	72.2	78.5	79.6	76.3	74.9	61.1
1980	87.6	79.3	77.6	80.4	69.3	77.9	82.6	78.3	78.7	60.4
1981	86.1	75.9	77.7	81.1	73.2	76.8	79.8	78.4	76.4	59.2
1982	82.2	75.7	75.9	83.4	70.7	77.0	77.9	77.4	77.2	58.5
1973/1982	13.5	-5.1	3.1	6.7	-6.4	5.4	2.4	3.1	7.9	3.7
	Weak demand									
1972	77.3	79.2	72.7	78.6	79.6	70.4	81.3	77.2	77.2	60.4
1973	75.2	80.7	73.9	76.4	77.3	72.5	77.8	76.1	76.6	58.5
1974	74.6	86.0	73.5	72.1	75.9	73.5	81.9	75.4	76.1	60.8
1975	91.7	81.2	73.6	82.9	86.2	83.2	86.0	81.8	76.1	73.0
1976	89.2	81.7	76.1	81.6	80.0	77.7	88.2	81.1	76.4	71.8
1977	89.1	82.6	77.1	82.6	81.3	78.1	83.9	81.3	76.3	74.9
1978	88.8	82.7	78.0	82.8	81.1	77.8	83.2	81.5	75.3	70.3
1979	88.1	82.9	77.6	79.5	75.6	80.8	86.9	80.1	75.8	66.1
1980	90.4	82.6	78.7	79.2	72.9	82.1	89.1	80.1	77.5	67.8
1981	90.8	86.5	81.3	81.2	77.5	82.6	89.7	82.6	77.7	72.1
1982	88.1	82.3	78.1	81.4	78.0	81.0	88.2	81.3	81.5	72.7
1973/1982	13.2	4.4	6.4	3.8	-0.7	10.3	9.4	5.3	2.7	13.0

(1) Change (1981-82)-(1972-73); 1985/1982

Table 17

Rate of investment (current prices)

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
Total industry										
1972	16,3	15,0	13,9	16,8	14,5	15,1	9,4	13,8	8,4	19,7
1973	16,0	16,8	12,1	15,8	16,1	15,6	10,3	13,6	8,4	21,5
1974	18,1	19,5	10,8	15,6	17,2	16,7	12,3	13,8	10,6	23,1
1975	17,9	15,0	10,7	14,1	14,6	15,9	11,7	12,9	10,5	20,8
1976	14,5	16,6	10,9	14,1	12,9	13,9	11,3	12,4	10,0	18,6
1977	12,0	15,1	11,0	13,5	12,7	17,1	11,3	12,3	10,7	17,2
1978	11,4	15,4	11,1	12,7	11,5	19,0	11,8	12,1	10,9	14,9
1979	11,4	14,9	12,1	12,7	11,6	19,9	12,2	12,5	11,1	17,3
1980	14,2	14,8	13,2	14,0	12,4	19,8	11,2	13,2	12,2	19,9
1981	12,8	13,4	12,9	13,5	11,9	18,7	8,8	12,3	11,8	20,2
1982	13,9	13,0	12,0	12,7	10,3	18,4	8,3	11,4	11,7	20,1
1973/1982	-2,8	-2,7	-0,6	-3,2	-4,2	3,2	-1,3	-1,8	3,3	-0,4
1983	12,8	13,0	11,7	12,3	9,8	18,5	8,4	11,5	12,3	18,6
1984	13,3	17,8	11,5	13,4	9,2	21,6	9,2	11,8	13,3	17,4
1985	12,8	19,2	11,9	13,3	10,8	23,6	9,6	12,4	13,9	17,3
1982/1985	-1,1	6,2	-0,1	0,6	0,5	5,2	1,3	1,0	2,2	-2,8
Strong demand										
1972	20,7		14,4	17,7	19,9	22,4	11,8		8,4	18,3
1973	18,4	17,0	13,2	17,1	20,5	19,7	11,3	15,3	9,3	22,7
1974	18,4	20,2	13,0	17,2	24,1	17,8	13,7	15,9	12,7	28,7
1975	24,6	16,5	13,7	17,0	24,7	20,7	15,0	16,8	13,3	24,3
1976	28,3	17,8	12,3	17,4	23,1	20,7	15,0	16,3	12,7	20,5
1977	17,3	19,0	12,5	17,3	22,0	26,5	14,6	16,0	12,7	20,5
1978	14,0	16,5	12,1	16,5	17,1	24,9	16,4	15,1	12,3	16,4
1979	14,3	20,3	13,1	16,6	15,1	20,7	16,1	15,1	12,6	19,9
1980	14,6	21,8	14,6	17,6	16,4	20,5	14,0	15,7	13,4	24,2
1981	12,2		14,2	16,6	15,5	22,2	11,9		13,4	25,0
1982	13,0		13,4	16,7	12,7	22,5	10,5		13,3	23,2
1973/1982	-6,9		-0,0	-0,8	-6,1	1,3	-0,4		4,5	3,6
Moderate demand										
1972	13,2		12,7	14,2	12,1	12,2	7,3		7,8	21,3
1973	14,5	15,7	10,8	13,8	13,7	14,0	8,9	11,7	7,7	23,7
1974	15,6	18,7	10,0	15,6	15,6	18,4	10,5	12,8	9,5	22,5
1975	11,5	14,8	9,7	13,3	11,6	15,0	9,4	11,2	8,7	18,0
1976	9,3	16,7	9,5	12,6	10,5	12,1	8,4	10,4	8,5	15,8
1977	10,3	14,2	10,3	12,7	12,2	14,4	9,2	11,1	9,5	15,9
1978	12,0	16,2	10,9	12,3	11,8	18,0	10,1	11,6	10,3	16,1
1979	11,7	14,3	12,0	12,0	12,8	21,5	11,1	12,3	10,9	18,4
1980	14,9	13,0	13,3	12,9	13,3	21,6	10,4	13,0	12,2	21,0
1981	13,7		13,1	12,9	13,0	19,6	8,1		12,4	19,6
1982	13,8		12,2	12,3	12,1	18,2	7,7		11,9	19,0
1973/1982	-0,1		1,0	-1,4	-0,3	5,8	-0,2		4,4	-3,2
Weak demand										
1972	17,1		15,1	19,3	14,4	13,4	12,0		9,4	19,2
1973	16,2	18,6	13,1	17,6	16,4	14,6	12,0	14,8	9,0	19,2
1974	19,7	20,8	10,1	14,9	15,9	13,5	14,7	13,7	10,6	20,8
1975	21,5	14,7	10,0	13,4	13,3	13,2	13,6	12,7	11,0	21,5
1976	13,1	15,9	11,8	14,2	10,9	10,6	14,4	12,6	10,0	20,0
1977	11,1	15,0	11,0	12,4	9,9	13,1	13,1	11,5	10,8	16,4
1978	9,3	13,3	10,6	11,2	9,2	15,3	11,9	10,8	10,5	12,9
1979	9,6	13,2	11,4	11,5	9,4	16,7	11,8	11,2	10,4	14,6
1980	13,1	14,7	12,0	13,4	10,5	16,2	10,6	12,0	11,3	16,2
1981	12,2		11,5	12,5	10,0	15,7	7,9		9,5	17,7
1982	14,4		10,3	11,0	8,2	13,2	7,9		10,1	19,0
1973/1982	-3,4		-3,2	-6,7	-6,3	0,5	-4,1		0,6	-0,9

(1) Change (1981-82)-(1972-73); 1985-1982

Table 18

Gross fixed capital formation (1975 prices) index: 1973 = 100

	B	DK	D	F	I	NL	UK	EUR 7	USA	JAP
	Total industry									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	105,4	123,5	92,1	102,1	118,3	109,0	107,0	102,1	107,2	119,1
1974	123,5	138,3	81,9	99,6	125,2	107,7	117,1	101,2	126,2	118,5
1975	108,7	106,3	75,4	87,8	93,8	98,8	105,4	87,8	113,4	98,8
1976	95,6	124,2	81,0	92,7	91,2	94,4	102,0	89,6	116,4	96,0
1977	79,7	115,4	85,6	93,2	92,2	111,7	106,7	91,5	133,3	93,4
1978	76,7	117,5	87,1	90,4	84,9	110,0	114,0	90,9	139,5	87,7
1979	78,6	117,6	95,5	195,5	94,1	107,8	118,2	97,6	141,0	105,8
1980	98,9	123,0	102,2	107,5	108,6	110,7	102,0	104,6	146,2	124,5
1981	89,5	103,5	97,7	102,6	98,8	93,7	76,5	95,8	143,1	134,4
1982	98,8	105,5	89,7	99,1	84,8	87,7	73,8	89,6	128,4	141,8
1973/1982	-1,0	-0,7	-0,3	-0,0	-1,9	-1,6	-3,5	-0,9	3,0	2,6
1983	93,9	117,6	90,0	102,2	77,2	91,3	72,8	91,3	139,4	135,2
1984	111,6	173,9	91,8	114,0	75,3	114,0	80,9	97,7	161,4	140,8
1985	111,6	198,5	99,2	114,6	89,3	128,3	86,4	106,7	173,2	147,4
1982/1985	4,1	23,5	3,4	5,0	1,8	13,5	5,4	6,0	10,5	1,3
	Strong demand									
1972	100,0		100,0	100,0	100,0		100,0	100,0	100,0	100,0
1973	96,7		97,9	112,4	110,6		94,7	103,2	117,6	126,4
1974	101,6		108,5	122,1	126,7		102,4	114,0	153,1	138,2
1975	122,6		101,1	108,6	112,5		110,0	107,5	147,8	109,0
1976	155,7		98,0	100,3	113,9		109,0	106,2	155,1	105,1
1977	100,1		105,2	123,3	109,2		113,5	111,2	170,6	111,2
1978	82,7		100,3	124,0	86,6		134,1	107,2	171,1	100,3
1979	87,1		108,7	136,9	83,3		133,2	112,9	175,2	124,5
1980	90,4		116,5	149,8	92,3		115,7	118,2	188,4	157,1
1981	77,1		113,5	140,3	82,7		92,0	108,9	194,9	179,4
1982	85,8		105,3	146,4	68,4		87,3	104,2	:	183,4
1973/1982	-2,1		1,1	3,4	-3,6		-0,9	0,5	7,3	5,4
	Moderate demand									
1972	100,0		100,0	100,0	100,0		100,0	100,0	100,0	100,0
1973	112,9		91,0	105,7	115,6		116,4	103,4	105,1	120,0
1974	122,2		80,6	114,6	129,6		124,7	105,4	118,2	108,1
1975	91,8		74,6	101,7	89,0		106,7	89,7	102,8	86,8
1976	77,6		80,3	104,3	86,5		98,2	90,3	107,2	82,5
1977	86,8		90,1	108,3	100,3		114,5	100,1	128,0	89,6
1978	104,6		98,9	106,9	100,5		127,1	105,8	140,0	93,8
1979	104,1		109,4	109,9	116,8		140,2	115,1	143,5	109,1
1980	133,7		119,8	120,9	131,3		125,3	123,2	149,2	128,7
1981	126,4		117,1	120,6	120,9		95,7	115,7	154,9	131,7
1982	133,7		110,2	117,1	112,8		92,0	110,6	:	136,4
1973/1982	2,3		2,0	1,6	0,9		-1,6	1,2	5,1	2,2
	Weak demand									
1972	100,0		100,0	100,0	100,0		100,0	100,0	100,0	100,0
1973	104,7		89,8	94,0	124,3		102,4	99,7	103,2	113,8
1974	135,8		67,5	76,6	120,6		115,5	89,6	118,4	116,3
1975	113,9		61,0	65,8	86,9		105,4	75,4	103,9	103,7
1976	77,7		71,6	76,6	81,9		101,0	79,0	102,3	102,9
1977	64,5		69,1	64,5	76,6		93,1	71,7	115,3	86,1
1978	54,0		66,8	58,3	72,2		87,7	67,0	118,3	74,7
1979	56,5		72,9	61,2	82,7		85,0	71,7	115,8	91,5
1980	78,8		75,1	72,3	100,3		68,7	78,3	115,3	101,2
1981	69,9		67,7	64,9	90,8		46,4	68,6	95,3	110,0
1982	81,1		58,8	56,6	72,7		45,9	60,3	:	121,9
1973/1982	-3,3		-4,4	-5,1	-3,5		-8,3	-4,8	0,5	0,9

(1) Average annual growth rate (1972-73) (1981-82); 1982: 1985

Table 19

Gross capital stock (1975 prices) index: 1972 = 100

	B	D	F	I	NL	UK	EUR 6	USA	JAP
Total industry									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	105,2	104,6	106,1	104,6	104,6	102,8	104,5	103,3	110,8
1974	111,0	108,1	111,9	109,7	109,4	106,0	108,9	107,4	121,6
1975	116,8	110,8	116,8	113,9	113,5	109,2	112,6	111,5	130,9
1976	121,3	113,2	121,1	116,9	117,0	112,0	115,7	115,0	138,0
1977	124,5	115,7	125,5	119,9	120,7	114,8	118,9	119,1	144,2
1978	126,8	118,3	129,4	122,6	124,7	117,8	121,9	123,7	150,0
1979	128,7	120,9	133,1	124,8	128,2	120,8	124,8	128,3	156,3
1980	131,3	123,9	137,1	127,3	131,6	123,6	127,8	132,9	164,2
1981	134,1	126,7	140,9	129,2	134,1	125,3	130,4	134,7	173,8
1982	:	128,8	143,7	130,5	:	126,5	:	:	183,8
1973/1982	3,3	2,5	3,7	2,7	3,3	2,4	3,0	3,5	6,1
1983	:	130,2	146,5	131,8	:	127,2	:	:	:
1984	:	131,5	149,0	132,8	:	128,1	:	:	:
1985	:	133,2	151,3	133,2	:	129,0	:	:	:
1982/1985	:	1,1	1,7	0,7	:	0,7	:	:	:
Strong demand									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	106,3	105,2	106,7	105,0	105,5	102,8	104,9	103,5	109,5
1974	112,5	110,5	114,1	110,7	110,4	105,6	110,0	108,5	120,1
1975	119,7	115,7	121,1	116,3	114,7	108,6	115,1	114,2	129,7
1976	128,9	120,1	126,8	121,5	119,0	111,8	119,7	119,7	136,1
1977	136,9	124,4	132,9	126,6	124,4	115,0	124,4	125,8	141,4
1978	141,4	128,4	139,7	130,5	129,4	118,6	128,9	132,0	147,1
1979	145,0	132,2	146,8	133,0	132,5	122,5	133,0	138,2	154,0
1980	148,7	136,3	154,3	134,9	134,6	126,0	137,0	144,6	162,9
1981	151,9	140,2	161,2	136,3	136,3	128,7	140,4	151,3	174,1
1982	:	143,3	167,0	137,8	:	130,6	:	:	186,5
1973/1982	4,8	3,7	5,3	3,3	3,5	2,8	3,9	4,8	6,2
Moderate demand									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	105,7	104,5	106,1	103,4	104,1	102,5	104,2	103,6	113,0
1974	112,1	108,0	112,6	107,5	109,1	105,6	108,4	107,6	125,3
1975	117,5	110,6	118,8	110,5	114,1	108,6	112,1	111,5	134,8
1976	120,8	112,9	124,3	112,2	118,0	111,1	115,1	114,7	142,0
1977	123,8	115,6	129,8	114,3	121,6	113,7	118,3	118,7	148,7
1978	127,6	118,8	135,2	116,8	125,8	116,9	121,9	123,7	156,0
1979	131,9	122,5	140,3	119,5	130,7	120,5	125,8	129,1	164,3
1980	137,3	126,7	145,9	122,8	136,1	124,0	130,0	134,6	174,8
1981	142,5	131,0	151,3	125,7	140,6	126,4	133,8	140,2	186,9
1982	:	134,6	155,8	128,3	:	128,2	:	:	199,0
1973/1982	3,9	2,9	4,5	2,5	3,9	2,6	3,3	3,8	6,8
Weak demand									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	104,4	104,2	105,8	105,3	104,4	103,3	104,6	102,9	109,9
1974	109,7	106,9	110,3	111,1	108,5	106,9	108,7	106,3	119,8
1975	115,2	108,1	113,4	115,4	111,4	110,4	111,7	109,5	128,7
1976	118,6	109,3	116,2	118,4	113,4	113,5	114,1	112,0	136,3
1977	120,0	110,7	118,8	121,0	115,2	116,3	116,3	114,7	142,8
1978	120,3	111,6	120,3	123,2	117,6	118,6	117,9	117,7	147,4
1979	120,2	112,4	121,5	125,0	119,9	120,5	119,2	120,4	151,8
1980	120,7	113,4	122,8	127,1	121,9	121,9	120,5	122,7	157,3
1981	121,8	114,0	123,9	128,4	122,8	122,4	121,4	116,9	163,9
1982	:	113,7	124,1	128,6	:	122,2	:	:	171,1
1973/1982	2,2	1,2	2,1	2,5	2,3	2,1	2,1	2,1	5,3

(1) Average annual growth rate (1972-73)/(1981-82); 1982/1985:
(1972-73)/1980-81); B, NL, EUR 6, USA

Table 20

Gross rate of return on capital, index: 1972 = 100

	B	D	F	I	NL	UK	EUR 6	USA	JAP
Total industry									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	98,9	97,5	106,4	114,0	97,2	104,8	104,2	99,8	101,5
1974	93,4	95,5	112,5	121,0	92,1	78,2	101,2	82,6	83,6
1975	56,4	83,6	77,4	80,9	57,8	61,8	76,4	82,5	58,4
1976	57,0	88,0	80,6	98,6	73,6	62,0	82,5	85,0	62,9
1977	57,9	86,3	76,5	92,3	64,5	78,8	82,0	89,4	62,1
1978	57,2	83,8	78,3	94,2	56,1	78,4	80,9	86,6	67,2
1979	60,1	81,5	85,1	114,7	48,1	64,9	81,7	76,4	70,2
1980	47,7	71,6	80,1	130,4	44,2	55,9	76,2	63,2	68,3
1981	49,2	65,7	74,0	112,0	45,6	53,2	68,9	66,7	65,5
1982	.	68,2	67,1	112,0	.	59,7	.	.	65,7
1973/1982	-8,6	-4,2	-4,1	0,5	-9,4	-6,4	-4,2	-5,2	-4,7
Strong demand									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	96,6	92,5	113,6	116,8	106,9	102,6	103,8	97,1	92,2
1974	89,0	116,9	137,4	125,7	130,9	79,3	116,4	77,3	66,5
1975	59,3	82,7	80,9	75,8	56,0	64,2	75,4	75,5	47,9
1976	56,8	88,8	69,7	88,7	77,4	69,6	79,9	82,6	56,9
1977	61,4	88,8	69,2	75,6	59,8	84,4	79,5	92,1	57,5
1978	55,3	76,5	75,5	81,7	50,8	81,3	75,1	87,7	66,1
1979	59,8	71,5	83,1	97,6	46,4	71,7	74,7	77,0	65,0
1980	46,0	57,4	72,1	101,4	37,1	72,6	66,3	70,9	64,4
1981	49,5	54,4	64,6	90,1	43,8	59,5	60,2	74,0	64,8
1982	.	56,0	53,8	93,1	.	73,3	.	.	67,4
1973/1982	-8,6	-6,0	-6,4	-1,9	-11,1	-4,6	-5,8	-3,8	-4,1
Moderate demand									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	87,0	100,8	101,6	113,0	92,9	76,8	98,1	99,4	97,1
1974	71,6	84,6	95,7	127,1	72,0	68,2	88,7	75,2	82,8
1975	67,5	82,4	80,3	95,0	65,3	51,5	77,1	84,4	67,3
1976	60,9	97,7	89,3	110,7	77,3	59,4	88,9	85,3	70,5
1977	60,6	95,0	82,6	104,2	69,8	79,7	88,7	86,8	73,1
1978	60,9	97,3	83,5	108,2	58,3	79,7	89,1	79,7	71,4
1979	61,8	92,9	86,7	126,5	50,1	65,5	86,7	67,0	69,4
1980	44,8	80,5	78,8	145,3	50,0	52,9	78,3	50,8	68,7
1981	48,0	76,3	77,2	122,3	49,5	56,8	73,9	54,8	69,5
1982	.	80,0	67,9	127,8	.	60,4	.	.	69,9
1973/1982	-8,4	-2,7	-3,6	1,8	-7,9	-4,5	-3,2	-7,6	-3,8
Weak demand									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	112,8	96,6	108,2	113,5	93,8	123,2	107,2	102,9	111,8
1974	119,1	95,0	119,9	115,6	85,4	96,3	106,4	101,4	96,4
1975	41,9	85,5	72,1	74,1	48,1	76,4	75,8	85,6	57,8
1976	51,8	76,5	75,9	95,0	64,6	59,9	77,2	86,6	60,3
1977	51,5	74,9	72,0	91,1	61,2	73,0	76,1	90,5	55,5
1978	52,5	73,0	71,3	90,4	58,2	73,8	74,9	97,6	64,0
1979	56,0	74,3	81,8	113,8	46,5	57,7	79,9	92,7	74,4
1980	50,0	70,1	84,4	131,2	42,3	45,8	79,7	78,1	70,3
1981	47,5	59,7	72,5	112,9	36,0	40,1	67,6	80,0	61,4
1982	.	65,0	72,2	108,4	.	44,8	.	.	59,5
1973/1982	-9,3	-4,9	-4,0	0,4	-10,7	-10,2	-4,2	-3,1	-6,0

(1) Average annual growth rate (1972-73)/(1981-82); 1982/1985;
(1972-73)/(1980-81): B, NL, EUR 6, USA

Table 21

Capital productivity, index; 1972 = 100

	B	D	F	I	NL	UK	EUR 6	USA	JAP	
Total industry										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	
1973	104,5	100,8	100,7	106,0	105,5	106,3	103,0	107,5	102,8	
1974	103,3	98,5	99,0	107,4	106,7	101,7	101,2	99,2	91,6	
1975	90,8	91,8	93,3	93,5	93,3	92,0	92,6	88,8	81,0	
1976	95,6	96,8	95,3	102,5	97,8	91,3	96,4	94,3	87,3	
1977	94,1	97,0	95,7	102,1	95,3	90,9	96,3	97,2	89,8	
1978	94,3	95,8	95,7	101,7	96,1	89,1	95,5	98,7	92,5	
1979	97,2	97,4	95,5	106,5	96,5	86,6	96,4	97,8	98,4	
1980	94,3	94,8	93,2	111,0	94,0	77,5	93,9	90,3	103,5	
1981	90,3	91,6	89,5	108,3	89,4	71,6	90,1	91,3	103,6	
1982	:	88,0	88,1	105,6	:	71,0	:	:	105,5	
1973/1982	-1,3	-1,2	-1,4	0,4	-1,4	-4,0	-1,2	-1,6	0,3	
1983	:	87,6	87,6	111,0	:	75,0	:	:	100,0	
1984	:	84,1	88,7	116,9	:	79,7	:	:	100,0	
1985	:	86,4	89,2	122,4	:	81,5	:	:	100,0	
1982/1985		-0,6	0,4	5,0		4,7			0,0	
Strong demand										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	
1973	109,4	104,4	104,8	107,5	109,1	110,0	106,5	107,2	106,1	
1974	112,4	111,6	107,5	110,3	120,3	110,9	111,6	99,9	97,6	
1975	93,3	98,6	100,1	96,3	94,2	100,9	99,1	90,1	83,8	
1976	99,9	105,5	103,1	103,6	105,0	102,4	104,7	95,0	98,3	
1977	100,8	108,3	105,0	102,7	101,2	102,5	106,1	98,5	107,7	
1978	105,3	104,4	105,5	106,4	103,9	102,7	105,5	101,3	123,1	
1979	108,9	105,3	105,6	112,0	107,5	101,3	106,9	102,3	131,5	
1980	101,6	101,5	98,9	118,8	102,4	93,5	103,2	97,8	150,0	
1981	98,4	100,3	96,1	117,2	95,5	88,0	100,6	98,6	162,6	
1982	:	96,5	93,8	120,9	:	88,3	:	:	176,2	
1973/1982	-0,6	-0,4	-0,8	1,5	-0,7	-1,9	-0,2	-0,7	5,7	
Moderate demand										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	
1973	101,6	101,1	100,4	106,9	106,6	105,0	102,9	108,0	103,3	
1974	99,6	96,1	96,5	107,9	104,9	102,1	99,7	98,6	94,4	
1975	93,6	91,1	93,2	95,5	99,2	93,6	93,4	90,3	85,9	
1976	95,4	98,4	95,0	103,5	101,3	92,3	97,4	96,0	89,8	
1977	94,2	96,3	94,4	103,2	98,8	91,8	96,3	98,8	91,8	
1978	93,2	96,1	93,5	104,2	98,2	90,0	95,7	98,6	88,4	
1979	95,4	98,3	93,5	106,3	98,0	87,4	96,3	96,0	92,8	
1980	90,3	95,1	91,4	109,7	95,7	81,0	93,6	86,9	94,6	
1981	87,0	92,5	87,6	106,8	92,3	74,6	89,9	85,1	92,4	
1982	:	89,2	86,5	102,0	:	73,0	:	:	90,2	
1973/1982	-1,6	-1,1	-1,6	0,1	-1,2	-3,6	-1,2	-2,3	-1,2	
Weak demand										
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	
1973	104,9	98,3	98,7	104,5	101,4	104,4	100,9	107,1	100,5	
1974	102,2	93,3	96,6	106,0	98,9	94,8	97,3	100,1	86,2	
1975	86,3	88,4	87,4	90,3	84,8	84,3	87,5	85,4	75,5	
1976	93,2	88,9	89,4	101,0	87,7	83,8	90,5	90,8	79,7	
1977	90,2	90,4	89,4	101,4	86,7	82,8	90,6	92,4	79,1	
1978	88,8	89,2	88,6	97,8	88,0	80,3	89,0	95,5	80,3	
1979	91,2	90,2	87,2	104,4	86,4	78,7	90,0	96,1	86,1	
1980	92,2	89,1	87,3	109,4	85,2	64,6	88,3	88,7	86,8	
1981	86,7	83,1	82,7	105,6	80,4	60,5	83,5	93,7	82,1	
1982	:	79,6	81,7	101,4	:	60,2	:	:	80,8	
1973/1982	-1,7	-2,2	-2,1	0,1	-2,4	-5,7	-1,9	-1,6	-2,3	

(1) Average annual growth rate (1972-73)/(1981-82); 1982/1985:
(1972-73)/(1980-81); B, NL, EUR 6, USA

Table 22

Capital labour ratio, index: 1972 = 100

	B	D	F	I	NL	UK	EUR 6	USA	JAP
Total industry									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	104,3	103,5	103,8	102,9	106,3	102,4	103,4	97,8	106,4
1974	109,3	109,6	108,3	105,5	111,4	104,9	107,6	101,6	118,0
1975	122,3	118,8	116,3	109,7	119,9	113,8	115,7	115,3	134,7
1976	132,6	124,8	122,2	112,4	129,0	120,7	121,6	114,7	140,8
1977	141,6	128,4	127,2	115,1	136,8	122,7	125,2	114,4	147,2
1978	150,1	131,7	133,3	118,6	144,8	126,7	129,6	113,9	154,5
1979	156,7	134,2	139,6	120,4	150,4	131,7	133,6	115,2	160,0
1980	163,2	137,1	146,0	122,1	156,1	138,3	138,0	123,4	165,6
1981	175,6	144,1	155,4	125,9	164,1	155,9	147,4	125,9	173,2
1982	:	152,0	161,3	129,7	:	166,5	:	:	183,7
1973/1982	6,5	4,3	5,0	2,6	5,6	5,3	4,3	2,9	6,3
1983	:	160,4	169,1	135,0	:	175,7	:	:	:
1984	:	162,9	177,7	141,4	:	179,5	:	:	:
1985	:	163,1	185,7	144,0	:	181,9	:	:	:
1982/1985	:	2,4	4,8	3,6	:	3,0	:	:	:
Strong demand									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	101,7	101,2	102,1	102,2	105,5	101,4	101,8	95,3	103,8
1974	102,3	104,1	105,3	101,7	106,7	100,6	103,2	97,2	112,0
1975	112,2	115,0	113,0	106,3	112,2	109,9	112,0	111,1	132,0
1976	124,8	123,3	119,1	110,5	121,4	117,9	119,5	113,1	136,9
1977	136,7	127,4	124,5	115,8	129,5	118,9	123,8	113,3	143,7
1978	144,0	132,1	131,5	120,6	137,9	122,4	128,9	112,5	151,7
1979	148,9	135,7	139,1	123,9	142,4	127,1	133,4	112,4	155,8
1980	155,0	139,2	147,6	126,2	144,8	132,4	138,0	117,8	152,5
1981	163,0	146,3	158,1	133,9	148,7	146,4	147,3	122,7	157,2
1982	:	155,9	165,8	139,9	:	155,9	:	:	168,4
1973/1982	5,9	4,6	5,4	3,4	4,6	4,6	4,4	2,6	5,3
Moderate demand									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	104,0	103,5	103,3	100,9	104,6	102,5	103,0	97,4	108,4
1974	112,3	109,1	108,4	101,8	109,6	104,4	106,8	101,3	120,7
1975	123,1	116,9	116,9	105,4	117,7	111,7	114,2	113,0	135,7
1976	130,1	120,9	122,5	106,9	126,1	117,1	118,8	112,6	141,6
1977	135,3	124,3	127,8	108,8	132,4	119,8	122,3	111,6	147,0
1978	141,3	127,6	133,8	111,3	139,3	122,6	126,1	111,3	155,7
1979	146,9	129,8	141,0	112,3	144,7	128,1	130,3	112,4	163,9
1980	153,7	132,9	148,2	113,9	152,6	133,7	134,9	121,2	175,5
1981	164,4	139,2	157,9	117,7	161,0	148,3	144,0	126,5	185,7
1982	:	145,5	164,6	123,0	:	158,5	:	:	198,6
1973/1982	5,7	3,8	5,3	2,0	5,5	4,7	4,1	2,9	7,0
Weak demand									
1972	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
1973	105,5	104,8	104,9	104,4	108,4	102,8	104,5	99,4	106,2
1974	110,0	113,2	109,3	108,9	115,7	107,9	110,2	104,3	118,8
1975	125,4	122,8	116,9	113,3	126,5	118,6	118,5	119,7	135,3
1976	136,6	129,3	122,8	115,9	135,7	126,6	124,4	116,9	142,2
1977	146,5	132,8	127,4	118,2	144,4	128,5	127,7	116,9	149,5
1978	157,6	135,2	133,1	121,4	152,7	134,2	132,0	116,1	155,3
1979	165,8	137,1	137,9	123,3	159,7	138,8	135,3	118,2	159,1
1980	172,3	139,2	142,3	124,9	164,9	147,6	139,1	127,1	164,1
1981	185,2	146,7	150,6	127,5	176,0	172,2	148,5	123,4	170,7
1982	:	157,0	154,8	129,5	:	184,5	:	:	178,7
1973/1982	7,2	4,5	4,5	2,6	6,3	6,5	4,4	2,9	6,0

(1) Average annual growth rate (1972-73)/(1981-82); 1982/1985
(1972-73)/(1980-81): B, NL, EUR 6, USA

Remarks on the tables

BDS: Sectoral data bank of the Commission of the European Communities.

Volimex: External trade data bank of the Commission of the European Communities.

Table 1

Definition: Domestic demand: production — total exports + total imports. Domestic demand in volume terms is obtained by deflating the relevant current price figure in national currency, by the implicit value-added price index, at market prices.

Sources: BDS for production data, Volimex for exports and imports.

Table 2

Definition: (Production — total exports) / (Domestic demand) at current prices, in national currencies.

Sources: See Table 1.

Tables 3 and 4

Definition: (Total imports and extra-Community imports) / (Domestic demand) at current prices, in national currencies.

Sources: See Table 1.

Table 5

Definition: Total exports / Production, at current prices, in national currencies.

Sources: See Table 1.

Table 6

Definition: (Total exports) / (Total exports of all OECD countries) at current prices, in USD.

Source: Volimex.

Table 7

Definition: (Exports to the Community) / (Total exports to the Community from all OECD countries), at current prices in USD.

Source: Volimex.

Table 8

Definition: (Total exports) / (Total imports) at current prices, in USD.

Source: Volimex.

Tables 9 to 23

Source: BDS.

Table 12

Definition: (Value-added at market prices, at 1975 prices) / (Total employment).

Table 14

Definition: Compensation of employees per head, deflated by the implicit price index of value-added.

Table 15

Definition: The figures in Table 14 divided by the corresponding figures in Table 12: (Compensation of employees per head in real terms) / (Real value-added per head).

Table 16

Definition: The wage and salary share at current prices (the share of the compensation of employees in gross value-added at factor cost) has been corrected by an estimate of the earnings of the self-employed, based on the average earnings recorded for each activity branch. For the United States and Japan, the denominator is gross value-added at market prices, at current prices.

Table 17

Definition: (Gross fixed capital formation) / (Gross value-added at market prices, at current prices).

Table 18

EUR 5: Grouping formed of Belgium, the Federal Republic of Germany, France, Italy and the United Kingdom, for which data on investment by activity branch, at 1975 prices, are available.

Table 20

Definition: Gross operating surplus / Gross capital stock at replacement cost. For the USA and Japan, the gross operating surplus is at market prices, at current prices.

Table 21

Definition: (Gross value-added at market prices, at 1975 prices) / (Gross capital stock at 1975 prices).

Table 22

Definition: (Gross capital stock at 1975 prices) / (Total employment).

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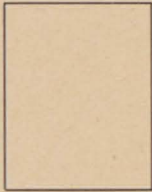
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