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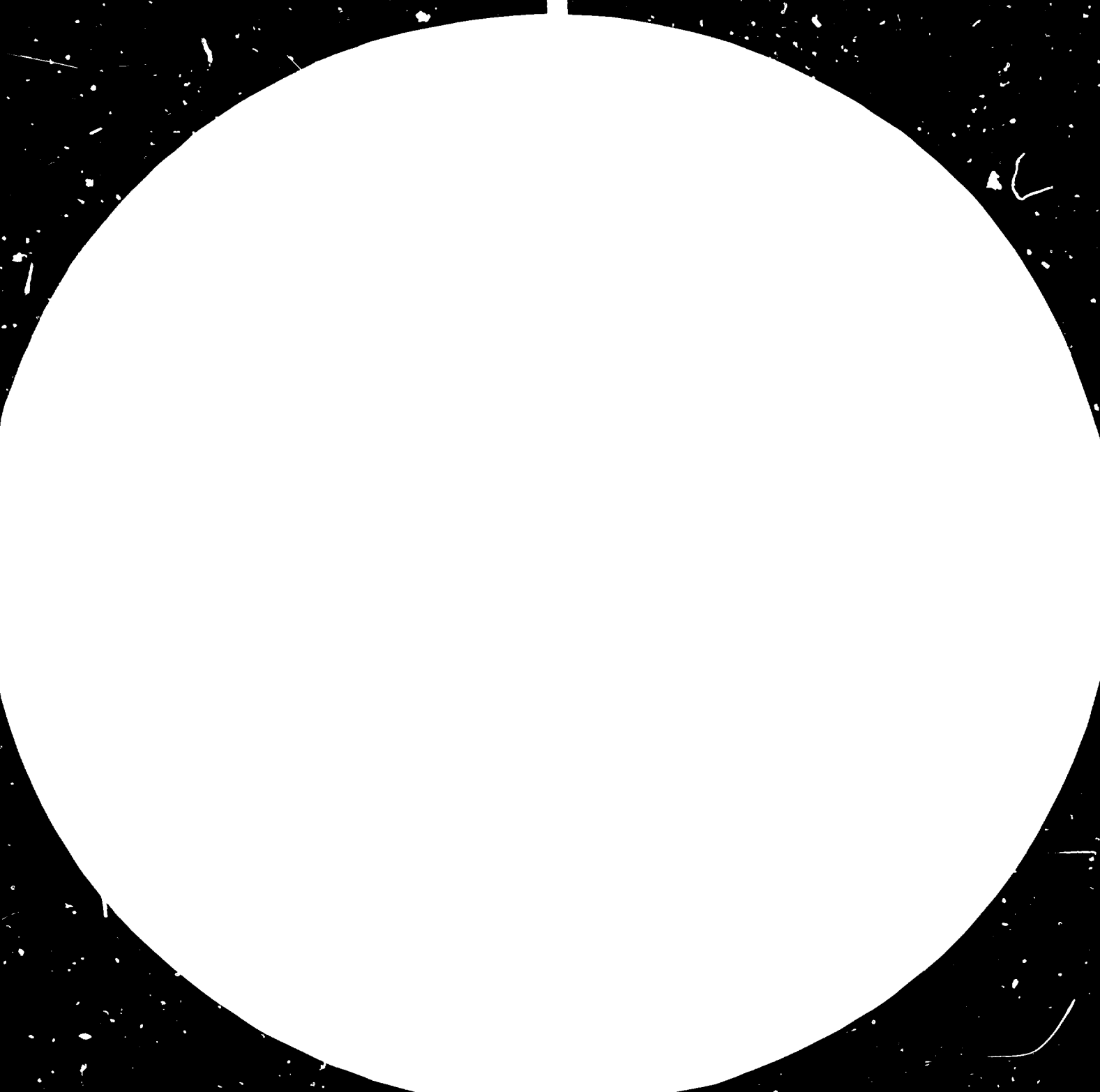

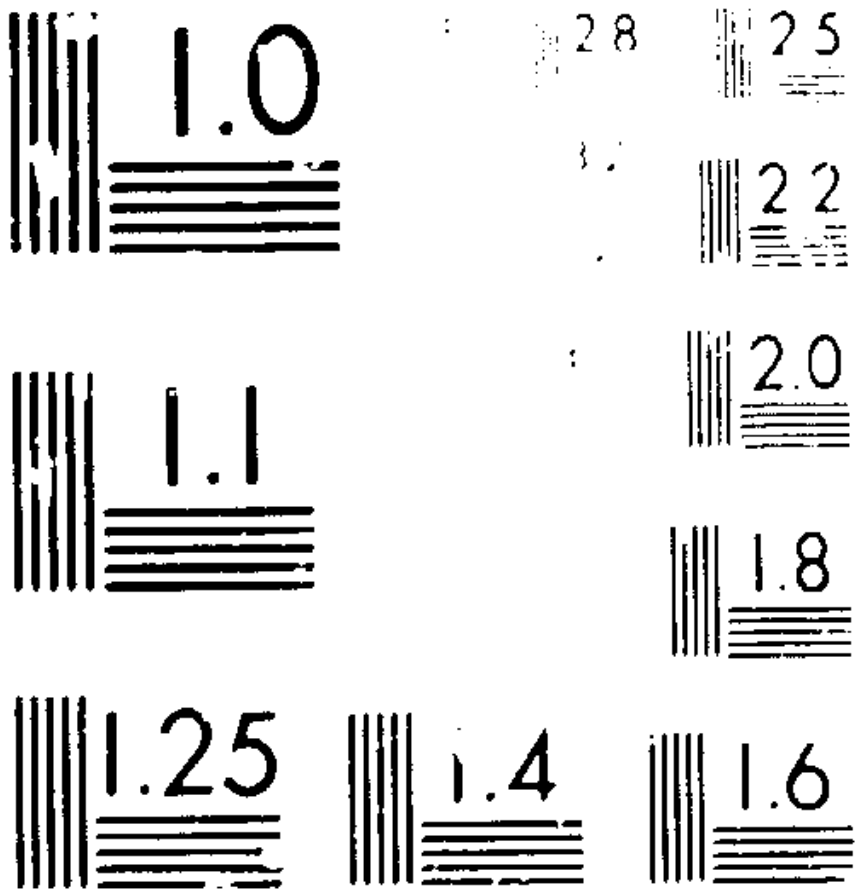
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STRUCTURAL CHANGE IN MANUFACTURING INDUSTRIES IN THE EUROPEAN CMEA AREA AND PATTERNS OF TRADE IN MANUFACTURES BETWEEN CMEA COUNTRIES AND DEVELOPING COUNTRIES *

by

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PREFACE

This study was undertaken in the framework of the research programme of UNIDO on industrial redeployment and structural change. This programme constitutes a surveillance of the international industrial restructuring process, aiming at highlighting pertinent trends in industrial development nationally and internationally. By identifying the factors that determine structural changes and indicating the likely direction and possible implications of this process, uncertainties and rigidities in this process might be reduced and a basis created for a forward-looking conception of industrial co-operation between the developed and the developing countries.

This study is part of a series of analyses undertaken on the centrally planned economy countries in Europe. It attempts to analyse past and prospective changes in the industrial structure of the East European CMEA countries and to highlight some major features of these changes. In the first part the study analyses the structure of manufacturing industries, the factors in productivity development and the future perspectives of the structural changes, whereas in the second it deals with the patterns of trade in manufactures between CMEA countries and developing countries.

The study was carried out by Ms. Ilse Grosser and Ms. Gabriele Tuitz, researchers at the Vienna Institute for Comparative Economic Studies, as UNIDO consultants in consultation with the UNIDO Secretariat.

List of Contents

List of tables in PART I

List of tables and diagrams in PART II

INTRODUCTION

Over the past fifteen years the CMEA countries experienced a long-term trend of slow-down in economic growth, reaching the so far lowest growth rates in 1979 and 1980 with 2.4 per cent and 2.7 per cent respectively. They will enter the 1980s with a strongly decelerated growth potential and structural imbalances. During the last five years in particular, growth of labour supply slowed down considerably in most countries and capital productivity deteriorated. A large volume of unfinished projects put a brake on investment expansion. Thus the retarding effects of the planning and management systems with their poor motivation structure for management and work force cannot be offset any more by mere multiplication of factor inputs. A structural policy in the years to come has to put substantially more weight on efficiency considerations than in the past.

Since most of the present problems were already foreseen, in principle, in the early seventies, when the CMEA countries attempted to promote the introduction of efficient technologies based on credit financed imports, it is of particular interest to see, how far the CMEA countries were able to adapt to new investment strategies.

The present study aims at an overview of the patterns of structural change in manufacturing industries in the CMEA area between 1965 and 1979. The results of this study should basically serve as a background to individual country studies, which can use more abundant and detailed national statistics and need not consider international comparability.

Due to limited time for data work and research the study relies heavily on work previously done in this field. As to data, an ideal set of statistics would have to be detailed and comparable between CMEA countries. Unfortunately the data sources are rather limited and not fully comparable with Western data. Only a few countries publish a consistent set of industry data regularily and in a sufficiently detailed breakdown (e.g. Hungary, 59 branches) while others publish highly aggregated data only. In some countries even some basic sets of data are not published at all. Therefore the present analysis was based primarily on the industry data for individual CMEA countries published by the CMEA secretariat (in

"Statisticheski ezhegodnik stran-chlenov SEV"). Despite several errors in the publications these data turned out useful, because they are widely comparable as to classification and definition (but not as far as relative prices are concerned).

The CMEA yearbooks give the output indices of 14 industrial branches (11 of which refer to manufacturing) in terms of "gross output at constant producer prices" on an organizational basis. In other terms the published indices as well as the countries' gross output structure represent the aggregate output of the enterprises in each branch. Thus, there are elements of double counting in two respects: (i) deliveries from one enterprise to another within the same branch are included in the gross output figure for the branch, (ii) deliveries from other sectors and branches to the manufacturing branches are also included, i.e. food processing, for instance, contains a component of agricultural output. This means that the shares of the various branches in total manufacturing gross output differ from those that would result from taking value added data. Producer prices exclude trade mark-up as well as turnover taxes net of subsidies. However, the comparability is disturbed much more by differences in relative prices between the centrally planned economies which were not taken account of by the CMEA secretariat when compiling the statistics.

For our purpose the published data on the industrial gross output structure of the CMEA countries, which are available for certain benchmark years only, have been recalculated, using the structure of 1970 as a base and multiplying them with the available annual indices (1970 = 100) at constant prices.

The figures on employment data represent the average annual number of wage and salary earners engaged in the enterprise of a given branch.

The published data on gross investment represent the annual expenditure on construction and equipment in these enterprises, expressed in current

prices. In most CMEA countries price increases in capital goods are infrequent. A comparison of the indices on gross investment in constant prices, published in the national yearbooks, with those in current prices exhibited minor differences for all countries except Poland and Hungary. Fortunately, Hungary publishes a price index for investment in total industry, which was used to deflate the branch indices of gross investment at current prices. An equal procedure was used in the case of Poland, where the national statistics give indices on total industrial gross investment in constant as well as in current prices, which allow the calculation of a deflator. Of course it would have been desirable to have different price indices for investment in individual branches to take account of disproportionate price increases dependent on the commodity composition of investment.

A serious handicap may be seen in the fact that, different from some of the national statistics, no data on fixed assets are published by the CMEA secretariat. This deficiency certainly will be overcome by the individual country studies.

Attempts to link patterns of structural change in manufacturing to structural change in foreign trade suffer from the complete lack of consistent statistics of output and foreign trade as to classification, definitions, and prices.

There is very little relationship between foreign trade prices and domestic prices. This means that even if one undertakes the laborious task of regrouping the data, indices of changes over time obtained on the basis of the foreign trade statistics would still not be comparable with the indices of changes in output, as there are quite different weights implied in the construction of the two indices. In order to derive changes in trade dependence by branches it would only be possible to extrapolate trade values expressed in domestic prices (derived from input/output tables of the mid sixties) by indices measuring changes in exports and imports in foreign trade prices.[1)] This could be done at a

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1) This was the method adopted by the ECE secretariat in: Structure and Change in European Industry, UN, New York 1977.

later stage, though the outcome would not be entirely satisfactory.

The methods applied and the structure of this study had to be adapted to the limited data available. It was decided to analyse the possible impacts of foreign trade in manufactures between East and South in a separate chapter (Part II) based on data supplied by international organizations (UNCTAD Yearbook of International Trade, UN Monthly Bulletin of Statistics). This way of handling the problem was finally justified by the results obtained, describing economic relations and, in particular, trade in manufactures between East and South as a missing link in world trade, a quantité négligeable having the character of a remainder with very little interaction of manufacturing industries in both regions.

Part I (chapters 1 and 2) devote themselves to the analysis of structural change and of efficiency of factor inputs in CMEA countries' manufacturing industries, where extensive use was made of the methods developed in previous studies of the United Nations:
"Structure and Change in European Industry", ECE Geneva, New York 1977;
"The European Economy from the 1950s to the 1970s", Economic Survey of Europe in 1971, Part 1, New York 1972
"Structural Trends and Prospects in the European Economy", Economic Survey of Europe in 1969, Part 1, New York 1970
"Some Factors in Economic Growth during the 1950s", Economic Survey of Europe in 1961, Part 2, New York 1962

Deviations from the methods applied in these studies are due to own considerations and to data limitations. E.g. the lack of consistent data on capital stock (fixed assets) made it necessary to use other measures than capital coefficients in order to get at least some indication of capital productivity development. Admittedly the Incremental Investment Output Ratio is a rather weak substitute for an Incremental Capital Output Ratio, but at least it gives some idea about changes in investment policy.

In the analysis preference was given to an unweighted area average as an indicator of the general picture of structural development patterns in the CMEA region. Due to unknown differences in relative prices of the individual CMEA countries, an aggregation of the data with the help of absolute figures derived from the national statistics would succumb to a substantial margin of error. Moreover, the overwhelming weight of the USSR in the CMEA area (appr. 70 %), would make a weighted area average pretty similar to the results obtained from a study about structural change in the USSR.

As to future perspectives of structural change, only a first attempt was undertaken in this study to extrapolate past trends. The results obtained can be taken only as one possible yardstick of future developments. The expected slowdown in economic growth of the CMEA countries and disturbances in the international markets will have their effect on the structural policies. In a further study, which could use the results of the present analysis as a point of departure, these extrapolations should be checked by quantitative and qualitative information on the perspectives of individual CMEA countries. Previous five year plans could be confronted with actual development and thus deliver valuable information for judgment on the plans for 1981-1985. But not only five year plans, but also other information supplied by the CMEA countries themselves and by international organizations should be integrated in such an analysis of future perspectives of structural change.

Despite the limitations of this first projection exercise it clearly turned out that in the individual country studies and in a further study on future structural change substantially more room should be given to intra branch specialization in machine building, chemical, and food industry. Very likely specialization patterns have changed and will affect distribution of output between broad branches to a lesser extent than in the past.

PART I - STRUCTURAL CHANGE IN MANUFACTURING INDUSTRIES IN THE EUROPEAN CMEA AREA

1. Structural change and growth in manufacturing output and inputs

1.1 The weight of manufacturing industry in total industrial production

The share of manufacturing in total industrial production is very similar in all CMEA countries. While the area average increased slightly from 76.4 per cent in 1965 to 78.8 per cent in 1979, only the GDR shows a somewhat declining weight of the manufacturing branches in relation to total industry. Despite of comparatively poor natural resources, in Czechoslovakia and Hungary the share of manufacturing in total industrial production is still lower than in all other CMEA countries, although it increased more dynamically (Table 1).

The cause of the above mentioned similarity of the division between manufacturing and primary branches seems to be the choice of industrialization targets or at least the heritage of a development strategy relying on import substitution. This defensive strategy may be favourable for a large country, rich in natural resources, such as the Soviet Union. For the small East European countries, poor in raw materials and with a home market of small absorbtive capacity, this structural policy, curbing as it does the development of the manufacturing industries, was for a long time not particularly advantageous for meeting the requirements of the international market and of the international division of labour.

Manufacturing industry employed, on average, four fifths of the total industrial working force of the CMEA countries, while only around one half of all industrial investment was allocated to the manufacturing branches. Until the midseventies the share of investment in manufacturing industry increased from a very low level in all countries except the GDR, but thereafter it declined somewhat in all countries except Romania.

It is an undeniable fact that the world's economic situation since the 1973 price explosion and the following recession in the Western market economies has enhanced the significance of structural policy especially with regard to external economic relations. The weakness of demand of western industrial countries after the recession of 1974/75, together

Table 1

Shares of manufacturing in total industry

Countries[1]	Gross output				Employment				Investment			
	1965	1970	1975	1979	1965	1970	1975	1979	1965	1970	1975	1979
GDR	79.7	77.4	77.0	77.3	87.1	87.5	82.0	81.8	39.0[2]	52.7[2]	47.5[2]	46.6[2]
Czechoslovakia	72.1	73.2	75.1	76.5	80.9	82.9	83.5	83.1	47.0	62.0	59.0	52.5
Soviet Union	77.5	77.3	78.3	79.5	84.3	85.2	85.8	84.2	50.1	54.4	55.4	53.9
Hungary	70.7	72.0	73.6	74.9	72.0	73.6	74.2	74.4	52.0	57.3	61.5	55.1
Poland	77.1	76.3	78.5	80.3	81.0	82.2	83.0	81.9	55.1	59.7	63.1	60.7
Bulgaria	79.8	78.7	79.6	81.1	75.1	76.0	78.2	77.4	44.1	64.3	68.1	60.8
Romania	78.1	78.6	80.2	81.7	84.3	86.0	88.1	88.3	43.6	56.7	56.0	61.9
Area average (unweighted)	76.4	76.2	77.5	78.8	80.7	81.9	82.1	81.6	48.7[3]	59.1[3]	60.5[3]	57.5[3]

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1) Sequence according to rank order in per capita GDP of 1970. According to the ECE estimates in the year 1970 the per capita GDP levels expressed in average US $ of 1970 amounted to: US $ 1990 in the GDR; US $ 1904 in Czechoslovakia; US $ 1548 in the Soviet Union; US $ 1419 in Hungary, US $ 1392 in Poland; US $ 1374 in Bulgaria; and US $ 1095 in Romania. The ranking of the countries was the same in 1965, while according to the estimates in 1973 (the latest year for which data are available), Poland and Hungary changed position.

2) Share of five branches in total industry

3) Excluding GDR

with the often low competitiveness of manufactured products of the CMEA countries, might have brought about their decision to tie up more development resources in the expansion of the energy sector and in the raw material branches rather than to expend them on export oriented, technologically more sophisticated branches. Another perhaps more striking reason are the deteriorating terms of trade for the smaller CMEA countries, which are dependent on raw material imports, and returned to an import substitution policy. The fact that the development of export oriented up-to-date branches requires a greater number of decentralized measures, while central control and decision systems are much easier to operate in energetics, metallurgy, mining etc., may be another aspect why economic policy in the CMEA countries gave preference in the second half of the seventies to the substitution of raw material imports at the expense of export orientation. The emphasis on energy and raw material programmes at the expense of technological programmes aiming above all to reduce the specific consumption of raw materials and energy and to improve international competitiveness, could be a source of structural difficulties for the small CMEA countries in the future because it does not pay due attention to long-term development requirements. In some countries' five year plans indications can be found that this ought to be rectified, but it remains to be seen how far this reorientation will materialize.

1.2 The structure of output and inputs in manufacturing industry

On the basis of the classification used here the weight of the various branches in gross output of total manufacturing is very uneven. In 1979 machine building (incl. metal processing) is by far the most important branch in the CMEA countries, producing 36.2 per cent of total gross output in Bulgaria's manufacturing industry and more than 40 per cent in every other country. Currently the share of food processing amounts to about 20 per cent in all CMEA countries except Romania, where it is astonishingly low (14.7 per cent). There are two other branches - chemicals and textiles - whose weight in total manufacturing gross output is quite high. In 1979 the share of chemical industry varied between 17 per cent

in Hungary and 9.8 per cent in the Soviet Union, that of textile industry between 10.2 per cent (USSR) and 5.8 per cent (Hungary). The remaining seven branches - construction materials; glass, china and ceramics; wood and wood processing; pulp and paper; printing; clothing; leather, furs and footwear - are relatively small Their share falls generally well below five per cent (Table A.1).[1)]

The distribution of sectors by employment and gross investment differs more or less from that based on gross output, since there are differences in factor productivity and factor intensity. Differences are less pronounced for employment structures (Table A.2) than for investment structures (Table A.3).

There have been large changes in the relative importance of the various branches during the period 1965 to 1979, with a certain uniformity in the pattern of change of the various structures. A striking exception to this general uniformity is the chemical industry where the change in the share of gross investment was in a different direction from that of total output.

Examining the extent of change in the structure of gross output based on area averages one can identify three groups of branches: one with a large increase in share of total manufacturing gross output (machine building and chemicals), at the expense of another group of branches (food and clothing) which is characterized by an appreciable decline in share, and a third group (comprising all other branches) whose weight is relatively small and whose share remained at the same level or declined marginally. The structural shifts by employment and gross investment towards the two branches of the first group was not as marked as the shift in the structure by gross output, implying an above average growth of factor productivity[2)] in this group (Table 2).

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1) The basic statistical tables to this chapter are presented in Appendix A, page 136 ff below.
2) If we can interpret an investment-output ratio as a proxy for a change in the capital coefficient.

Table 2

Grouping of branches according to the extent of structural change in output and inputs (based on unweighted area averages)

	1965	1970	1975	1979
	in %			
Branches with an increasing importance (machine building and chemicals)				
Share in: gross output	39.4	45.8	51.1	54.9
employment	44.9	47.8	50.2	51.7
gross investment	52.6	53.9	54.8	60.4
Branches with appreciably declining importance (food and textiles)				
Share in: gross output	39.7	34.3	30.4	27.8
employment	25.3	23.6	22.4	21.8
gross investment	22.4	21.8	22.5	19.9
Branches with small or no decline in weight (comprising the remaining seven small branches)				
Share in: gross output	20.8	19.9	18.6	17.5
employment	29.8	28.6	27.4	26.4
gross investment	24.8	24.3	22.7	19.7

The two branches showing an appreciable decline in the share by gross output also experienced a drop in the share by employment and gross investment, although at a much less pronounced rate than with output, signifying a considerable decline in relative levels of productivity. All other branches where the weight in total manufacturing gross output remains small or declined somewhat experienced on the whole a decline of shares by employment and gross investment to an equal extent. While relative investment intensity declined somewhat in this group of branches, relative factor productivity remained the same.

As mentioned above, in discussing the output structure, the underlying concept was that of gross rather than net output. The fact that no suitable value-added data are available for the centrally planned economies presents a certain impediment to the analysis, since gross output data are distorted in several respects. The value of gross output is influenced by double counting which has its strongest effect in the food industry. The element of duplication is relatively strong in light industry too, while it is generally less than average in construction materials and glass (incl. china and ceramics). Finally, differences between countries in the structure of gross output are certainly influenced by differences in relative prices. The same applies to the branch breakdown of gross investment.

Changes in relative prices over time cause similar problems. On the other hand, differences in relative prices have generally a much str effect on the branch structure of net production than on gross out The distortive effect of double counting on the output structure is very likely less pronounced than the distortive effect of different relative prices on the structure of value added. Thus, under the given distortions, gross output data should be given preference anyway.

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1) G. Fink, Preisverzerrungen und Unterschiede in der Produktionsstruktur zwischen Österreich und Ungarn, Springer-Verlag, Wien - New York 1981 (in print)

1.3 Dynamics of structural change in manufacturing industry and features of specialization in the CMEA countries

The dynamics of structural shifts in manufacturing industry were generally considerable in the countries with a lower development level, especially Romania and Bulgaria, while these shifts were far less pronounced in the highest per capita income countries of the CMEA, GDR and Czechoslovakia (Table 3). Hungary equally shows a lower intensity in structural shifts, although her development level is moderate. This may be explained by the more advanced industrial structures of Hungary in 1965 in relation to the recorded per capita income level.[1] The different dynamics of structural change in manufacturing industry of the individual CMEA countries brought about a tendency towards convergence in industrial structures.

Generally there has been a greater intensity in shifts in gross investment than in employment structures. An extreme case of this uniform feature is Romania during the period 1965 to 1970, where the shifts in employment have been hardly greater than in the GDR, while those in gross investment were strongly marked. The extremely low investment intensity of the Romanian machine bulding industry in 1965 seems to be the most important reason for her development policy which in this period more than elsewhere relied on reallocation of investment as a means of achieving structural change in output.

Structural shifts with regard to gross output, employment and investment became less marked in the first half of the seventies as compared with the period 1966-70, though there are some exceptions (the Soviet Union as to gross output, Romania as to employment, Poland and Bulgaria as gross investment). In the period 1976-79 the intensity of structural shifts with regard to gross output and employment did not decrease further except in Romania and Bulgaria. With regard to investment, on the other hand, there has been a marked increase in the dynamics of structural change in this period in all countries except the Soviet Union. Considering the general scarcity of manpower in most CMEA countries,

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1) But there are also increasing doubts whether the Hungarian GDP is not considerably underestimated.

Table 3

Dynamics of structural change in manufacturing industry
(average annual change of branch shares in percentage points, [1])

	Gross output				Employment				Gross investment				Average annual growth rate of manufacturing industry (1966-1979)
	1966-1970	1971-1975	1976-1979	1966-1979	1966-1970	1971-1975	1976-1979	1966-1979	1966-1970	1971-1975	1976-1979	1966-1979	
GDR	1.5	0.8	1.4	1.2	1.5	1.2	0.8	0.9	3.0[2]	2.4[2]	2.1[2]	0.7[2]	5.9
Czechoslovakia	2.2	1.5	1.5	1.7	0.6	0.2	0.6	0.4	4.1	3.8	4.3	2.1	6.7
Soviet Union	2.3	2.7	2.7	2.4	1.2	1.1	1.2	1.0	4.3	2.7	1.2	2.1	7.3
Hungary	2.2	1.6	1.5	1.8	1.4	0.7	0.7	0.9	4.3	3.9	6.5	2.5	6.3
Poland	3.4	2.2	2.2	2.5	1.2	0.8	1.1	1.0	3.1	4.1	5.9	1.6	8.7
Bulgaria	4.0	3.1	2.7	3.1	2.3	1.8	1.4	1.8	3.4	3.9	8.2	2.9	9.0
Romania	3.8	3.8	2.1	3.1	1.7	3.0	1.7	2.1	10.1	2.8	5.0	3.9	12.2

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1) Calculated as $\Sigma \left| \frac{Qn - Qo}{n} \right|$ where Qn = Percentage share of given branch at end year
Qo = Percentage share of given branch at base year
n = Number of years in the time interval

2) referring to only five branches

this reflects the growing importance of the reallocation of investments for structural transformation of output.

As the possibilities for increasing productivity or capital intensity differ in the various branches and the demand for products of each sector is growing at different rates it is obvious that structural changes have growth effects. Structural transformation within the manufacturing industry of the CMEA countries brought about a regrouping of growth resources towards sectors where productivity growth was relatively dynamic (machine building and chemicals), while sectors where the possibilities for productivity growth are lagging behind - light industry and food processing - became less important.

To achieve growth effects by means of the above characterized structural transformations is of course easier in countries on a lower development level than in more advanced countries. Accordingly there was quite a strong interdependence during the period 1966-79 between the level of growth of manufacturing industry and the dynamics of structural change in the various countries ($r = 0.86$). The correlation between the rate of growth of manufacturing and the dynamics of structural change in employment and investment is equally strong amounting, to 0.86 and 0.78 respectively.

However, care must be taken in actually reading causal relationships into the statistical correlations revealed by the analysis. A rapid expansion of employment and investment in manufacturing industry may in itself favour structural changes as well as the growth rate of aggregate manufacturing output. Whether it was the structural component or the different volumes of inputs which influenced inter-country differences in growth rates of manufacturing industry more strongly will be closer scrutinised in Chapter 2.

The rather dynamic growth of manufacturing between 12.2 per cent in Romania and 5.9 per cent in the GDR during the period 1966-1979 certainly cannot be maintained in the years to come. Three basic macro-structural considerations may be pertinent to this stipulation. First, at least the

earlier period of rapid growth was accompanied in all CMEA countries by considerable shifts in manpower from other sectors (mainly agriculture) to manufacturing. With the exception of Romania, the supply of manpower is expected in future to grow substantially slower than in the past. Second, at the attained income levels more emphasis than in the past has to be put on the development of services and the infrastructure. Thus at a slowing down of the growth of labour supply a larger proportion of new labour has to be devoted to the services sectors, otherwise becoming a serious bottleneck. Third, the expansion of some branches will have to be checked because of the rising costs of energy and raw material inputs.[1)]

Because of the expected slowdown in growth of total manufacturing industry the dynamics of structural change will probably become less pronounced. Furthermore, intra-branch cooperation and specialization has already become a more important feature than inter-branch specialization, thus a reduced dynamic of structural change on the branch level might be accompanied by more significant changes in the micro-structure (within branches and even sub-branches).

As far as the longterm development of inter-branch specialization is conderned economic theory generally assumes a U-shaped curve[2)] to describe the relation between developmental levels and specialization in output.[3)] This simply reflects the relatively wider spread between the shares of machine building on the one hand, food processing and light industries on the other in lower income countries, where production is highly concentrated in the latter branches. Assuming the importance of machine building to rise and that of food and light industry to fall during the development process, shares come closer together initially, but since machine building is continuing to gain in output share, specialization is increasing again.

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1) See I. Dobozi, "Problemes of raw material supply in Eastern Europe", The World Economy, Vol. I, No. 1.
2) See "Structure and Change in European Industry", UN, New York 1977, p. 168 f.
3) Concentration of production in one branch would mean the highest degree of specialization and equal shares of all branches in output the lowest degree. The standard deviation of branch shares around the mean branch share in a given country measures the degree of specialization at the branch level.

In the time interval considered such an U-shaped curve of output concentration can be indentified in Bulgaria, reaching the point of inflection in the first half of the seventies. The Soviet Union, Poland and also Romania, which has a relatively advanced industrial production structure in relation to her development level, approached the turning point in the second half of the 1960s. The numerical value of the standard deviation coefficient at the turning point was very similar in all four countries, amounting to about 10 (Table 4). The more developed countries, GDR, Czechoslovakia and also Hungary reached the point of inflexion on this curve before the period under investigation.

On the whole the degree of specialization in output (dispersion of shares) tended to rise in all countries, the standard deviation reaching the highest value in Czechoslovakia (13.2) and the lowest in Bulgaria (11.4).

The inderdependence between relative development levels and the degree of specialization in output can also be identified with regard to employment, but does not hold generally for investment. The standard deviation coefficient as to employment rose continously in all countries, reaching, in 1979, the highest numerial value in the GDR (14.1) and the lowest in Bulgaria (9.9).

While the degree of concentration of investment in 1979 is higher in all CMEA countries than in 1965, a feature revealed also for gross output and employment, a continously increasing degree of specialization cannot be identified. The dispersion of investment shares declined in Czechoslovakia between 1965 and 1970, it declined also in Hungary between 1965 and 1975 and in Bulgaria and the GDR between 1970 and 1975. Only in the second half of the 1970s we find investment becoming more concentrated in all countries. In contrast to the picture which emerges from output and employment based calculations, the standard deviation coefficient with regard to investment shares in 1979 is highest for Romania (13.8) and the Soviet Union (13.4), countries with a lower development level than Hungary and Czechoslovakia, where the degree of concentration is the lowest (11.0 and 11.5 respectively).

Table 4

Features of specialization in the CMEA-countries, measured by the standard deviation of branch shares from the mean branch share

	Gross output				Employment				Investment			
	1965	1970	1975	1979	1965	1970	1975	1979	1965	1970	1975	1979
GDR	11.7	12.2	12.2	12.8	12.7	13.7	13.9	14.1	16.5[1)]	17.5[1)]	15.4[1)]	17.2[1)]
Czechoslovakia	11.3	12.0	12.5	13.2	12.5	12.7	12.7	13.0	10.6	8.8	10.2	11.5
Soviet Union	10.4	10.3	11.2	12.1	11.9	12.4	13.1	13.5	10.3	11.7	13.0	13.4
Hungary	11.8	12.2	12.5	12.6	11.1	11.4	11.5	11.7	10.4	10.1	9.4	11.
Poland	10.4	10.7	11.8	12.7	9.8	10.6	11.0	11.6	10.5	10.6	11.6	12
Bulgaria	11.8	10.5	10.8	11.4	8.4	8.8	9.4	9.9	9.1	10.2	9.4	12.
Romania	9.9	9.9	11.4	12.2	8.4	8.6	10.2	11.0	8.8	10.5	11.6	13.8

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1) referring to only five branches

The deviations of the output shares of individual branches from the area average were mostly diminshing. The extent of specialization at the branch level within the area tended to become smaller for machine building, chemicals, glass (incl. china and ceramics), wood and wood processing, pulp and paper and food processing. It is likely and also to be expected that, with the progress of economic development, specialization between the CMEA countries has taken place within rather than between these branches. Contrarily the degree of inter-country specialization increased for construction materials, printing and clothing, while remaining at the same level for textiles and leather (incl. furs and footwear) (Table 5).

Convergence is also indicated as to employment structures where the coefficient of variation increased only for pulp and paper (contrary to the tendency in output), for textiles, clothing and leather.

The picture emerging with regard to investment is notable: while indicating a fairly strong tendency towards convergence in the second half of the 1960s for all branches except chemicals, printing and textiles, it points in the opposite direction in the 1970s. It is also noteworthy that gross investment shares for chemicals and food processing tended to spread further during the period considered, while convergence is evident in output and employment shares. In 1979 the degree of inter-country specialization as to investment was smaller than in 1965 only for machine building, glass, and for wood and wood processing.

1.4 The branch pattern of growth of gross output, employment and investment

Taking the period 1965 to 1979 as a whole, there has been no branch where the absolute magnitude of gross output and investment declined, with the exception of gross investment in Hungarian's pulp and paper industry (Table A.7). There are only a few branches where the number of persons employed in 1979 is absolutely lower than in 1965. This is the case in the printing industry in the GDR and in Romania, in wood and wood processing in Bulgaria and Hungary and in the construction material industry of Hungary (Table A.6).

Table 5

Degree of convergence of branch structures in manufacturing industry, measured by coefficient of variation of deviations of branch shares in individual countries from the area-wide average

	Gross output				Employment				Gross investment[1]			
	1965	1970	1975	1979	1965	1970	1975	1979	1965	1970	1975	1979
Machine building and metal processing	0.22	0.17	0.10	0.07	0.20	0.18	0.14	0.12	0.22	0.11	0.19	0.11
Chemicals and rubber	0.23	0.17	0.17	0.19	0.26	0.19	0.18	0.18	0.13	0.14	0.22	0.29
Construction materials	0.21	0.23	0.25	0.28	0.25	0.26	0.26	0.25	0.26	0.20	0.14	0.38
Glass, china and ceramics	0.46	0.44	0.41	0.40	0.33	0.36	0.33	0.31	0.62	0.37	0.56	0.53
Wood and wood processing	0.37	0.30	0.16	0.14	0.58	0.56	0.40	0.34	0.72	0.47	0.28	0.40
Pulp and paper	0.41	0.33	0.32	0.36	0.25	0.22	0.25	0.27	0.58	0.37	0.31	0.64
Printing	0.41	0.46	0.63	0.52	0.23	0.24	0.29	0.23	0.46	0.51	0.63	0.82
Textiles and knitwear	0.21	0.23	0.21	0.21	0.16	0.17	0.20	0.21	0.23	0.27	0.21	0.24
Clothing	0.25	0.33	0.36	0.37	0.16	0.19	0.18	0.22	0.29	0.15	0.45	0.35
Leather, furs and footwear	0.19	0.16	0.18	0.19	0.23	0.26	0.27	0.27	0.35	0.30	0.47	0.59
Food (incl. beverages and tobacco)	0.18	0.15	0.16	0.16	0.31	0.26	0.25	0.27	0.22	0.19	0.22	0.44

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1) not including GDR

Gross output in total manufacturing industry has risen in the area as a whole by some 8 per cent a year (unweighted average) since 1965 (Table A.4). The Soviet Union and Bulgaria achieved their fastest average annual growth during the period 1966-1970, while the development of manufacturing gross output in all other countries was most dynamic in the first half of the 1970s. Common to all countries, there is a significant slowing down of growth in the second half of the 1970s; the overall average in this period amounted to only 6.4 per cent a year.

While inter-country differences in growth rates of gross output have been marked, the inter-country variability in growth elasticities, obtained by dividing branch growth rates by overall weighted growth rates of the manufacturing industry, were much smaller. Considering the period as a whole the growth elasticity of machine building, chemicals and glass (incl. china and ceramics) industry was in all countries above-unit, while the growth elasticity for textiles, leather (incl. furs and footwear) and food are everywhere below-unit (Table A.5). As to the remaining branches, there are countries exhibiting an above-average growth elasticity as well as countries where these branches developed relatively more slowly. But on the whole it is possible to identify a certain similarity in the branch profile of expansion.

On average, employment in manufacturing industry increased in the area over the period as a whole by 1.9 per cent p.a. (unweighted average). But it rose at one extreme by as much as 5.1 per cent p.a. in Romania and at the other by as little as 1.1 and 1.2 per cent p.a. in Hungary and Czechoslovakia respectively (Table A.6). The different rates of expansion of employment in manufacturing industry indicate, on the whole, a quite strong correlation with development levels.

As with output, the growth rate of employment tended to decrease over time. Between 1976 and 1979 Romania still expanded employment in manufacturing industry at the rate of 3.7 per cent p.a. and there is no branch where manpower declined absolutely in this period. Contrary to this, all other countries have branches showing an absolute decline in

employment during this period. Generally most affected were the branches of light industry, while Hungary was the only country where the rate of expansion of employment in machine building was also negative, resulting in an absolute decline of manpower in total manufacturing industry.

Gross investment increased in the area as a whole during 1965 to 1979 by an annual average (unweighted) of 9.4 per cent (Table A.7). Expansion was slowest in Czechoslovakia and the Soviet Union (about 6.5 per cent) and fastest in Bulgaria (10.4 per cent) and Romania (14.5 per cent). Generally speaking, higher growth rates of gross investment were associated with higher growth rates of employment and lower levels of industrial development. Changes over time in the aggregate growth rates of investment in manufacturing were also characterized by a slow-down, though, as with employment, machine building is generally much less affected than light and food industry.

In the period 1976-1979 large inter-country differences were evident in the development of aggregate investment in manufacturing industry, which can hardly be explained by differences in relative development levels. While Romania maintained a very high rate of expansion (14.2 per cent), Poland reveals an absolute decline in gross investment by almost five per cent annually, after a period of credit induced, soaring investment expansion. In Czechoslovakia and also in Bulgaria the rate of expansion of aggregate investment was very modest in this period, amounting to 1.5 and 1.7 per cent respectively. Out of the remaining countries the GDR shows the most dynamic increase of investment (5.5 per cent), followed by Hungary (4.7 per cent) and the Soviet Union (3.1 per cent).

The differences between the branch growth rates in the individual CMEA countries were considerable (Table 6). The standard deviation coefficient which measures the dispersion of the various branch growth rates tends to be larger in countries with higher growth rates. Compared with the standard deviation the differences between of the variation coefficient for gross output and investment are rather small. As this is

Table 6

Average annual unweighted growth rate of branches (A), standard deviation (B) and coefficient of variation (C) of branch growth rates by country, 1966-79

	Gross output			Employment			Investment		
	(A)	(B)	(C)	(A)	(B)	(C)	(A)	(B)	(C)
GDR	5.38	1.19	0.22	1.35	1.42	1.65	7.59[1)]	0.81[1)]	0.11[1)]
Czechoslovakia	6.09	1.50	0.25	1.18	0.64	0.54	6.79	2.82	0.42
Soviet Union	6.96	2.38	0.34	1.77	1.11	0.63	5.79	2.51	0.43
Hungary	5.94	2.50	0.42	1.11	1.42	1.27	8.17	5.54	0.68
Poland	7.70	2.41	0.31	1.74	0.97	0.56	8.56	3.20	0.37
Bulgaria	8.97	3.07	0.34	2.70	1.95	0.72	7.79	5.14	0.66
Romania	10.86	3.64	0.33	4.16	2.56	.62	11.50	6.78	0.59

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1) referring to only five branches

not the case for employment, where the coefficient of variation for the GDR and Hungary is exceptionally high in relation to the other countries, one may deduce from this that labour distribution policies played a relatively greater role in the attainment of structural changes of output in countries where the scarcity of manpower is more pronounced than in those where labour resources have been more easily available (as in the Soviet Union, Poland, Romania and Bulgaria). Czechoslovakia may be an exception to this general statement.

Countries with a relatively higher growth rate of total manufacturing gross output, employment or investment have tended to have higher growth rates in every branch. The comparative uniformity of the ranking order of branch growth rates confirms this general tendency (Table 7).

Inter-country differences in the rate of expansion of the various branches were mostly wide, with the exception of the fast growing branches. As already mentioned, machine building and chemicals were the most dynamically growing branches. In the individual CMEA countries they assumed either the first or the second rank in order of output growth. The only significant exception is to be found in Hungary, where machine building ranked only fifth in average growth during the period 1966-1979. Glass (incl. china and ceramics) followed in rank order, assuming an average rank 3 (Table 8).

There is a large gap between the average rank of the above mentioned three branches and the other industries. This gap also marks the line between above-unit and below-unit grow elasticities (based on area averages, shown in Table A.5).

With an average rank between 6.3 and 6.6, construction materials, pulp and paper, printing and clothing follow in this order. The area average of the growth elasticitiy of these branches is somewhat below-unit but their spread in ranks was much greater than in other branches.

Wood and wood processing, leather (incl. furs and footwear), textiles and food were the slowest growing branches. The ranking of the wood and

Table 7

Average rank of branches[1] and standard deviation of ranks from the average, 1966-79

	Gross output		Employment		Investment	
	Average rank of 11 branches	Standard deviation	Average rank of 11 branches	Standard deviation	Average rank of 11 branches	Standard deviation
GDR	5.8	1.24	4.9	1.96	4.3[2]	1.84[2]
Czechoslovakia	5.1	0.75	5.2	1.23	4.2	2.04
Soviet Union	4.4	1.25	4.4	1.58	4.5	1.08
Hungary	5.4	1.58	5.1	1.28	3.9	1.94
Poland	3.2	1.56	3.6	1.49	3.0	1.76
Bulgaria	2.4	1.29	3.0	1.95	3.9	2.02
Romania	1.6	1.43	1.7	1.48	2.7	1.81

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1) ranking by growth rates; average rank of branches in the area
2) referring to five branches only

Table 8

Rates of growth of gross output and their ranking order by branches, 1966-1979

	Average unweighted growth rate	Coefficient of variation	Average rank	Standard deviation of average rank	Rank order of average rank
Machine building and metal processing	10.68	0.31	1.9	1.32	2
Chemicals and rubber	10.97	0.29	1.8	0.84	1
Construction materials	6.98	0.42	6.3	1.98	4
Glass, china and ceramics	9.05	0.23	3.0	1.07	3
Wood and wood processing	5.63	0.21	7.7	2.66	8
Pulp and paper	7.17	0.36	6.4	2.38	5
Printing[1)]	6.68	0.28	6.8	3.08	7
Textiles and knitwear	6.02	0.47	8.2	1.51	10
Clothing	7.07	0.45	6.6	2.43	6
Leather, furs and footwear	5.97	0.30	8.1	1.46	9
Food (incl. beverages and tobacco)	5.00	0.21	9.5	1.17	11

1) Excluding Soviet Union

wood processing industry also shows a high degree of dispersion, reflecting a very low growth elasticity in the Soviet Union, Bulgaria and Romania (eleventh, and tenth respectively in rank order), and an especially high one in the GDR (fourth in rank order). The leather (incl. furs and footwear) industry assumed a rank between 8 and 10 in all CMEA countries except the GDR, where it is fifth in rank order with a growth elasticity near one. The textile industry shows the highest ranking in Romania (sixth in rank order) and Poland (seventh in rank order), where the growth elasticities are only marginally below one. In all other countries the rank of this branch varies between 8 and 11. The ranking of the food industry exhibits a low degree of dispersion with the growth rate falling between ninth and eleventh in rank, though Hungary is an exception, her food industry assuming seventh place in rank order.

The profiles of output growth are rather similar between CSSR, USSR, Hungary, Poland and Bulgaria (coefficient of correlation being mostly higher than 0.7). Only the GDR and Romania show a somewhat distinct pattern, where a similarity can be observed only between the growth patterns of GDR and CSSR ($r = 0.7$) and Romania and Bulgaria ($r = 0.75$) (Table 9).

The growth patterns by individual branches of employment and investment differ much more than growth patterns of output. As to employment, the spread in ranks was particularly wide for the clothing industry, wood, pulp and paper, and printing, making it almost misleading to describe the relative position of these branches in terms of an average figure (Table 10). The same applies to printing, pulp and paper, glass and wood industries with regard to investment (Table 11).[1)]

Despite the greater differences between national patterns of employment growth, the calculated averages do provide a picture of overall tendencies not much different from output growth patterns. Comparing average

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1) A more detailed correlation analysis can be found in chapter 2.3.

Table 9

Coefficient of correlation (for pairs of countries) between average branch growth elasticities in the period 1966-79

	GDR	Czechoslovakia	Soviet Union	Hungary	Poland	Bulgaria
Czechoslovakia	0.70					
Soviet Union	0.37	0.81				
Hungary	0.46	0.80	0.73			
Poland	0.61	0.78	0.83	0.57		
Bulgaria	0.53	0.85	0.84	0.72	0.61	
Romania	0.60	0.54	0.55	0.26	0.56	0.75

Table 10

Rates of growth of employment and their ranking order by branches, 1966-79

	Average unweighted growth rate	Coefficient of variation	Average rank	Standard deviation of average rank	Rank order of average rank
Machine building and metal processing	3.49	0.62	2.6	1.75	1
Chemicals and rubber	3.29	0.61	3.1	1.66	2
Construction materials	1.18	0.96	8.3	1.46	9.5
Glass, china and ceramics	3.07	0.49	3.2	1.41	3
Wood and wood processing	0.71	2.10	8.3	3.41	9.5
Pulp and paper	2.42	0.55	4.9	2.92	4
Printing[1)]	0.92	1.55	7.8	2.41	8
Textiles and knitwear	1.05	2.20	8.6	2.06	11
Clothing	2.34	0.87	5.6	3.43	5
Leather, furs and footwear	1.80	0.63	6.9	1.27	6
Food (incl. beverages and tobacco)	1.46	0.63	7.4	2.10	7

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1) Excluding Soviet Union

Table 11

Rates of growth of investment and their ranking order by branches, 1966-79

	Average unweighted growth rate	Coefficient of variation	Average rank	Standard deviation of average rank	Rank order of average rank
Machine building and metal processing	11.68	0.46	2.7	1.67	1
Chemicals and rubber	7.39	0.60	6.4	2.66	7
Construction materials	9.20	0.46	4.6	2.65	3
Glass, china and ceramics[1)]	8.24	0.89	6.9	3.58	8
Wood and wood processing[1)]	6.09	0.55	7.1	3.44	9.5
Pulp and paper[1)]	4.13	1.15	7.9	3.82	11
Printing[1)]	9.69	0.67	5.2	4.10	5
Textiles and knitwear	6.78	0.52	7.1	2.43	9.5
Clothing[1)]	8.99	0.28	4.5	1.96	2
Leather, furs and footwear[1)]	7.29	0.33	6.1	2.52	6
Food (incl. beverages and tobacco)	8.63	0.34	5.1	2.10	4

1) excluding GDR

rank order for employment with that of output one can identify four branches which assume a significantly different position. Construction materials rank much higher in employment than in output while food, leather, and clothing rank considerably lower in employment than in output.

A comparison of the figures for gross investment with those of output, conversely, reveals a rather different pattern. There are only five branches - machine building, construction materials, wood and wood processing, printing, and textiles - where the average rank order for investment and output is not significantly different. Clothing, leather, and food industry rank much lower, on average, in investment than in output. It is the same feature that was identified above with regard to employment. The remaining three branches - chemicals, glass, pulp and paper - exhibit a much higher average rank order for investment than for output. The most striking case is the chemical industry which assumes the first rank with regard to gross output but only the seventh with regard to investment. This is possibly due to the investment boom in chemical industry which started in the late 1950s and reached its peak around the mid-sixties. Thus investments in chemical industry were relatively high at the beginning of the period under investigation, but due to time lags between investment and putting new capacity into operation, capital stock very likely will show substantially higher growth than investment.

Finally there are also large differences when comparing the figures for employment and investment. Chemicals, glass, pulp and paper rank lower, construction materials, printing, clothing and food rank higher by employment than by investment.

2. Development of factor productivity and the pattern of factor proportions by branches

2.1 Relative levels and growth of factor productivity by branches

Differences in the national levels of relative labour productivity are generally not strongly marked. Conversely, relative labour productivities of the individual branches differ considerably and show a certain similarity in the direction of change over time (Table B.1).[1)]

To illustrate the branch differences as well as the intertemporal development of the levels of relative labour productivity we divided the fifteen-year period under consideration into three five-year subperiods (Table 12).

In the second half of the 1960s food industry exhibited by far the highest level of relative labour productivity. Though it declined sharply until the second half of the 1970s, it remained higher than in all other branches. This is, to some extent, due to double countings in this branch.

While relative labour productivity in the chemical industry was already above average during the earlier period considered here, it increased further to an appreciable extent until the second half of the 1970s. Another branch where relative labour productivity was generally above average is the pulp and paper industry; but otherwise than in chemical industry, relative productivity declined in this branch.

In machine building relative labour productivity increased, reaching a level that corresponds rather closely to the average level of labour productivity in manufacturing industry of the individual countries.

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1) The basic statistical tables to this chapter are presented in Appendix B, page 151 ff. below.

Table 12

Area average (unweighted)
of national levels of labour productivity in five-year periods
(Total manufacturing = 100)

	1965-1969	1970-1974	1975-1979
Machine building and metal processing	84	89	95
Chemicals and rubber	136	152	163
Construction materials	76	77	77
Glass, china and ceramics	49	50	50
Wood and wood processing	72	70	68
Pulp and paper	110	105	99
Printing	52	53	52
Textiles and knitwear	89	86	83
Clothing	72	70	66
Leather, furs and footwear	72	67	63
Food (incl. beverages and tobacco)	225	207	179

In the remaining branches - construction materials, glass (incl. china and ceramics), wood and wood processing, printing, textiles (incl. knitwear) clothing and leather (incl. furs and footwear) - levels of relative labour productivity generally fell well below average. In most of these branches relative labour productivity declined over time or remained at the same level.

The growth rate of labour productivity in total manufacturing industry amounted to 5.6 per cent a year in the area as a whole (unweighted average) since 1965 (Appendix Table B.2). The dispersion of growth rates by countries, extending between 4.1 (GDR) and 6.8 per cent (Romania) was smaller than for output or employment. As in the case of the other variables, a relation with development levels is indicated. As with output, the growth rates of labour productivity were higher in most countries in the first half of the seventies both compared with the period 1966 to 1970 and 1976 to 1979. The GDR and Romania are exceptions. Not only in the period 1966-1970 but also in the second half of the seventies did both countries have higher productivity gains than in the first half of the 1970s.

The development of labour productivity by branches has been rather uneven in the CMEA-countries. Using the method of rank averages again, Table 13 provides a summary picture of the relative position of the individual CMEA countries together with the standard deviation coefficients, measuring dispersion of ranks for the period as a whole.

The least favourable place on the average is occupied by the GDR, followed by Czechoslovakia. The GDR ranked seventh in all branches except textiles, clothing and leather, while Czechoslovakia, showing the most uniform performance, ranked fourth or fifth in all branches except pulp and paper. The Soviet Union and Hungary showed rather mixed patterns. The Soviet Union varied between second place (glass, china, ceramics) and sixth place (chemicals, construction materials, wood and wood processing, textiles and leather), Hungary between the first (wood and wood processing, printing) and the seventh place (textiles, clothing, leather).

Table 13

Average ranks of labour productivity[1] assumed by various branches and standard deviation of ranks from the average, 1966-79

	Average ranks	Standard deviation
GDR	6.0	1.95
Czechoslovakia	4.9	0.53
Soviet Union	4.6	1.43
Hungary	4.6	2.31
Poland	3.0	1.13
Bulgaria	2.5	1.49
Romania	2.2	1.19

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1) ranking by growth rates; average rank of branches in the area

Poland assumed first place in glass, while it assumed second, third or fourth place in all other branches except pulp and paper. Romania and Bulgaria ranked first or second in most branches and assumed the top places on average. But there are also branches where these countries had relatively smaller productivity gains. For Bulgaria this is the case in chemical and glass industry (third place), in wood and wood processing, and textiles (fourth place) and in printing (sixth place). For Romania the same applies in machine building, wood and wood processing (third place), glass and printing (fourth place).

What impact changes in the employment structure have on the overall index of labour productivity growth poses an interesting question.

The rate of growth of labour productivity for total manufacturing industry has been defined in this study as the ratio of the index number of manufacturing gross output in 1979 (1965 = 100) to that of total employment in this sector. The resulting index number of aggregate labour productivity thus reflects not only the rise of output per employee in each branch of activity but also the effects of faster expansion of some branches than of others - in other terms, changes in the structure of the economy.

Even if output per employee in each branch had remained constant over time, aggregate labour productivity in manufacturing industry would have risen if employment in branches of relatively high output per employee had expanded faster than in others with lower output per employee.

Actually, labour productivity increased appreciably in all countries while the spread of the growth rates of the various branches was rather high.

There are only a few branches where the absolute number of employees in 1979 was lower than in 1965. Thus the CMEA countries attained structural changes in employment primarily by allocating the additional labour force employed in manufacturing industry disproportionately to the

various branches. The declining share in most countries of employment in the food industry - a branch where output per person is generally high - may have had a negative impact on growth of aggregate labour productivity in manufacturing industry. On the other hand those branches where the growth rate of labour productivity was more dynamic generally obtained a greater part of the additional labour than branches where productivity gains have been lagging behind. This stipulation must be treated with caution because the question of causality is not settled. It may well be that rapid expansion of manpower in some branches provided the possibility for their above-average labour productivity gains (Verdoorn law), while the opposite may be true for other branches.

To assess the influence of structural shifts on growth of gross output per employee in total manufacturing industry the indices of o rall labour productivity in the individual countries may be split into two parts - indices of sectoral productivity and indices measuring the effects of structural change.

In Table 14 standardized indices of overall labour productivity are presented. They are calculated as indices of the branch productivities in 1979 (1965 = 100) weighted by the shares of each branch in employment at the beginning and at the end of the period investigated. The re- ng structural component measures the contribution of shifts in loyment structure to the development of aggregate labour productivity during the whole period considered.[1)]

While the data indicate that in all countries except the GDR the contribution of structural shifts to the overall growth of labour productivity in manufacturing industry has been positive - generally more so in the

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1) The structural component is a Paasche weighted average of the indices of the sectoral shares in total employment (weighted by the sector productivities). See "Some Factors in Economic Growth in Europe", op.cit., p. 35

Table 14

The contribution of structural change to the aggregate growth of labour productivity in manufacturing industry

	Standardized indices of labour productivity growth		Structural component
	A[1]	B[2]	
GDR	184.7	182.3	98.7
Czechoslovakia	216.9	218.5	100.8
Soviet Union	223.8	230.0	102.8
Hungary	197.0	197.8	100.4
Poland	244.2	250.6	102.6
Bulgaria	240.8	252.6	104.9
Romania	246.3	254.4	103.3

1) A - using the employment structure of 1965 as weight
2) B - using the employment structure of 1979 as weight

less developed than in the more developed countries - shifts in the structure of employment played a very minor role on the whole. Thus the growth of aggregate labour productivity was mainly a result of productivity gains within branches.

However it must be noted that the relevance of this result depends on the assumption that the changes in the distribution of employment by branches and the changes in branch productivities are independent of each other; only then is it accurate to calculate a standardized index of labour productivity assuming the structure to be constant. Actually at least a part of the increase of labour productivity in the various branches must be due to the increase in employment itself or to the associated increase in capital equipment. Therefore the figures in Table 14 probably underestimate the structural component.

The reason for the negative impact of the structural component in the GDR is primarily the appreciable decline of manpower in the country's textile industry where labour productivity gains have been especially high - contrary to experience in the other countries. While the impact of structural changes is negligible in Czechoslovakia and Hungary, favourable shifts in the employment structure in the Soviet Union, Poland, Romania and above all Bulgaria have contributed a little to aggregate labour productivity growth (0.18 % to 0.34 % p.a.).

As mentioned above, there are very considerable differences between branches in labour productivity gains: from 7.4 per cent annually on average for the whole area in chemicals, down to 3.5 per cent in food processing (Table 15).

When the ranking pattern is considered, chemicals and machine building show the highest average rank since they assumed first or second position in most countries. Chemical industry ranked lower only in the Soviet Union (third). The performance of machine building was less uniform: in the GDR and Romania it stood at third, in Hungary at fourth place in ranking order. Glass, printing, construction materials, clothing, wood

and wood processing, textiles and pulp and paper ranked somewhere in the middle on average, but with a rather wide spread. Thus textiles for instance assumed between first (GDR) and eleventh rank (Bulgaria), while pulp and paper stood at between fourth and tenth in rank order. In the great majority of cases leather and food industry are the two lowest ranking branches. They assumed between ninth and eleventh place with the only exception of the leather industry in the GDR, where it ranked fourth.

A comparison of average ranks by gross output growth (Table 8) with that of labour productivity clearly shows a strong correlation ($r = 0.91$).

The faster growth rates of output associated with faster growth rates of labour productivity are also in evidence in inter-country comparisons (Table 16). Conspicuous exceptions (more than two places) are wood and wood processing in the GDR, printing in Bulgaria and glass in Romania, where labour productivity growth rate ranked lower than output growth rate, further textiles in the GDR and wood (incl. wood processing) and printing in Hungary, where the opposite is true.

An appropriate measure for capital productivity would consider a country's actually utilized productive capacity in relation to output. The increase in the productive capacity during a period is the outcome of the additions made by installation of new equipment less scrapping of old equipment; in other words, less the part of gross investment that is required for replacement. The relationship between this increase of the available capital stock (adjusted for changes in actual capacity utilization) and the increase in product (incremental capital-output ratio) would be an appropriate measure for changes of capital productivity. However, since capital stock data are mostly not available, it is common usage to deal with ICORs wich are defined as the relationship between the gross investment ratio and the change in product, though there are

Table 15

Labour productivity: rates of growth and ranking by branches, 1966-1979

	Average unweighted growth rate	Coefficient of variation	Average rank of growth rate	Standard deviation of average rank	Rank order of average rank
Machine building and metal processing	6.9	0.20	2	1.20	1.5
Chemicals and rubber	7.4	0.18	2	0.53	1.5
Construction materials	5.7	0.36	5	2.22	5
Glass, china and ceramics	5.8	0.24	4.7	1.73	3
Wood and wood processing	4.9	0.23	7	2.19	7
Pulp and paper	4.6	0.33	7.6	2.32	9
Printing[1)]	5.9	0.11	4.8	2.11	4
Textiles and knitwear	4.9	0.18	7.1	2.80	8
Clothing	4.6	0.36	6.6	1.94	6
Leather, furs and footwear	4.1	0.21	8.9	2.11	10
Food (incl. beverages and tobacco)	3.5	0.26	10.4	0.79	11

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1) excluding Soviet Union

Table 16

Rank order of branches by growth of output (O) and of labour productivity (Lp), 1966-1979

	GDR		Czechoslovakia		Soviet Union		Hungary		Poland		Bulgaria		Romania	
	O	Lp	O	Lp	O	Lp	O	Lp	O	Lp	O	Lp	O	Lp
Machine building and metal processing	6	7	5	5	4	4	7	6	3	2	2	1	1	3
Chemicals and rubber	7	7	6	5	5	6	3	2	4	4	2	3	1	1
Construction materials	6	7	3.5	4	3.5	6	7	5	5	3	2	2	1	1
Glass, china and ceramics	7	7	6	5	4	2	5	6	2	1	3	3	1	4
Wood and wood processing	3	7	4	5	7	6	5	1	1	2	6	4	.	3
Pulp and paper	6	7	5	6	4	4	3	3	7	5	1	2	2	1
Printing	7	7	5	4.5	2	3	4	1	3	2	1	6	6	4.5
Textiles and knitwear	6	1	5	5	4	6	7	7	3	3	2	4	1	2
Clothing	6	6	5	4	4	5	7	7	2	3	3	2	1	1
Leather, furs and footwear	4	3	5	5	6	6	7	7	3	4	2	1	1	2
Food (incl. beverages and tobacco)	7	7	6	5	4.5	3	4.5	6	2.5	4	2.5	1	1	2

growing doubts as to the actual significance of this ratio.[1)]

Since, contrary to the national statistics, no capital stock data are published by the CMEA secretariat, the present reseach is restricted to the calculation of incremental gross investment-output ratios as a proxy for the efficiency of the additional investment.[2)] A worsening of this coefficient in a given subperiod may well result from a large amount of investment tied in unfinished projects, while in a later period when the productive capacity becomes operative and contributes to output growth, the IIOR may well improve. Thus in shorter subperiods the incremental gross investment-output ratio is a very poor indicator for the relationship between the actual increase in capacity and pertinent growth, while the dynamics of investment may well reflect changes in the capital stock for the whole period investigated, since one might assume that a large part of the presently existing productive capacity was built during the past fifteen years.

Gross investment in manufacturing industry grew in most countries of the area at a faster rate than gross output, resulting in a quite significant increase in the incremental gross investment-output ratio (IIOR) during the period 1966-1979 (Table B.3). The increase amounted to an unweighted average of 0.9 per cent a year; however, this figure conceals wide differences between countries. Thus, whereas the IIOR rose (investment efficiency declined) in Bulgaria, the GDR[3)], Hungary, Poland and most of all in Romania, it declined in Czechoslovakia and in the Soviet Union at an average annual rate of -0.3 per cent and -0.7 per cent respectively.

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1) Since scrapping as well as changes in capacity utilization are not taken into account the "Gross investment-product increment ratios" are biased. They have the implicit property to vary inversely to the growth rate. See H. Schimmler, "What are ICORS? Comment on a common mistake", in: Kyklos Vol XXXIII, 1970.
2) Because of the lack of output data in absolute terms, the calculation of average investment output ratios was equally not possible.
3) As data on investment for the GDR are only available for five branches, calculation of the development of IIOR is possible for the aggregate of these five branches, but not for total manufacturing industry.

No association can be discerned between the direction and/or dynamic of the development in incremental gross investment-output ratios and relative development levels, either for the whole period investigated or for the various shorter time intervals.

Changes in the IIOR over time were characterized by a high degree of instability. In the period under investigation the most marked deterioration in the growth relationship between gross investment and output occurred in the second half of the sixties in all countries (except the Soviet Union).[1] The Soviet Union is the only country where the incremental gross investment-output ratio declined in this period - but also to a smaller extent than in the 1970s. In the 1970s there was a general improvement of the IIOR in Bulgaria, Czechoslovakia and in the Soviet Union. This improvement was more pronounced in the second half of the seventies than in the period 1971-1975. The GDR and Romania, too, show a decline in the incremental gross investment-output ratio in the first half of the 1970s, but the ratio deteriorated in the period 1976-1979. A slight deterioration of the IIOR in Hungary in the first half of the 1970s was followed by a slight improvement in the second half.

Poland in the 1970s is a very special case. The investment boom in the first half of the period brought about a rapidly increasing IIOR in total manufacturing industry. While gross investment declined appreciably in absolut terms during the period 1976-1979, output increased still on average at a satisfactory rate, resulting in a marked improvement of the IIOR. Generally investment and output performance are more strongly correlated in market economies, especially at lower development levels, whereas this relationship seems to be very weak in the CMEA countries and particularly in Poland.

The rate of change in the incremental gross investment-output ratio varies from branch to branch, exhibiting a low degree of uniformity of

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1) Very likely this is due to postponed investment, which could not be realized in the first half of the 1960s.

behaviour. Thus there were branches - not only in Czechoslovakia and the Soviet Union but also in every other country - where the IIOR declined (investment efficiency rose) during the period 1966-1979, as the figures in Table 17 show. Although the predominant tendency for the IIOR was to increase in the area as a whole, one finds 31 cases (out of a total of 70 for which data are available) where the ratio improved.

Generally a certain pattern of output requires a certain pattern of investment which may well vary in volume - from time to time or from country to country - as a consequence of variations in the efficiency of management, in the possibility of intensifying the use of capital stock during the period considered, and of many other influences.

As the investment requirements of the individual branches differ and there are also differences in the real return to investment, the extent to which changes in the structure of gross output influenced the development of investment efficiency (the inverse of the IIOR) can be assessed, using the same method as for measuring the influence of shifts in the employment structure on the overall growth of labour productivity.

The structural component in aggregate incremental gross investment output ratio is favourable (less than 100) in all countries except Romania (Table 18). Thus structural policy in most CMEA countries seems, on the whole, to have been in favour of branches with an above average investment efficiency.

Hungary exhibits the most favourable act of structural changes, mainly because of her dynamically expanding share of the chemical industry, where the IIOR declined markedly. The reason for the negative impact of structural shifts on the development of the IIOR in Romania is primarily the rapid increase of the share of machine building, where investment efficiency declined sharply.

Changes in the incremental gross investment-output ratio by branches did not follow a well-defined pattern. Consequently the area averages

Table 17

Frequency distribution by countries of average annual percentage changes in the incremental gross investment-output ratios, 1966-1979

Annual rates of change in incremental gross investment output ratio	GDR	Czechoslovakia	UdSSR	Hungary	Poland	Bulgaria	Romania	Total
Above 6	-	-	-	4	-	1	1	6
4 - 6	1	2	-	-	2	1	2	8
2 - 4	1	2	-	1	3	-	1	8
0 - 2	2	3	4	3	1	2	2	17
- 2 - 0	1	2	3	1	4	2	2	15
- 4 - 2	-	1	2	-	-	3	2	8
- 4 - 6	-	-	1	1	-	1	-	3
Below - 6	-	1	-	1	1	1	1	5
Number of observations	5	11	10	11	11	11	11	70

displayed in Table B.3 show overall tendencies only very imperfectly. Characteristic differences in the movement of the IIOR between various branches are revealed more clearly in Table 19, where the period as a whole as well as shorter intervals are considered, which reflect, beyond differences in efficiency, the cyclical development of investment which may have economic as well as technical reasons (different gestation periods).

The behaviour of the incremental gross investment-output ratio by branches is especially notable in the second half of the seventies. This period was characterized by an absolute decline of gross investment in many branches, while the growth rate of output diminished in almost all branches of the countries, but output did not decline in absolute terms. This resulted in a very marked improvement of the IIORs; there are only 15 cases (out of a total of 70) where the IIOR deteriorated. In most branches (44 out of 55 cases where the IIOR declined) the improvement amounted to more than 2 per cent p.a.[1)] Contrary to the prevailing experience in the other sub-periods, the improvements of the IIOR took place also in the light and food industries.

Considering the period as a whole, the chemical industry is the only branch where IIOR did not deteriorate in any country. The development of IIOR is predominantly favourable (4 out of 7 cases) also in machine building, glass and pulp and paper.

There is some resemblance between the pattern just described and the branch profile of change in the indicators previously discussed. Chemicals was identified as a fast-growing branch with appreciable labour productivity gains, whereas light and food industries were found to be relatively slow growing branches with a growth of labour productivity below average. But there are also branches where no similarity exists

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1) Very likely this would not be the case if the whole capital stock would be taken into consideration. Even if investment declines absolutely in some years, the productive capacity may well increase at the same time.

Table 18

Contribution of structural change to the development of gross investment-output ratio in total manufacturing industry

	Standardized indices of development of IIOR		
	A[1]	B[2]	Structural component
GDR	135.4	130.2	96.2
Czechoslovakia	113.8	106.6	93.7
Soviet Union	90.9	88.2	97.0
Hungary	159.4	143.1	89.8
Poland	129.9	119 2	97.8
Bulgaria	105.8	100.3	94.8
Romania	158.2	165.3	104.5

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1) A - using the output structure of 1965 as weight
2) b - using the output structure of 1979 as weight

Table 19

Frequency distribution of average annual percentage change in incremental gross investment-output ratios by branches

	1966-1970				1971-1975				1976-1979				1966-1979			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Total manufacturing	-	1	1	5	2	3	1	1	3	2	1	1	-	2	5	-
Machine building and metal processing	-	2	1	4	4	1	1	1	2	2	1	2	-	4	2	1
Chemicals and rubber	5	-	-	2	3	1	-	3	4	1	1	1	4	3	-	-
Construction materials	-	-	-	7	3	1	1	2	3	2	2	-	-	2	3	2
Glass, china and ceramics	2	-	1	3	5	-	-	1	3	-	-	3	3	1	1	1
Wood and wood processing	1	1	-	4	1	2	1	2	5	1	-	-	1	1	2	2
Pulp and paper	3	-	1	2	3	-	-	3	2	2	-	2	4	-	-	2
Printing	1	-	-	4	1	-	-	4	5	-	-	-	1	1	1	2
Textiles and knitwear	-	1	1	5	1	3	1	2	5	1	1	-	1	--	4	2
Clothing	-	-	-	6	2	1	-	3	5	-	-	1	1	1	2	2
Leather, furs and footwear	-	1	-	5	1	-	-	5	6	-	-	-	1	1	1	3
Food (incl. beverages and tobacco)	-	1	-	6	-	1	-	6	4	2	-	1	-	1	1	5
Number of observations	12	6	4	48	24	10	4	32	44	11	5	10	16	15	17	22

A = Decline of more than -2.0 per cent per year
B = Decline of between -2.0 and 0.0 per cent per year
C = Increase of between 0.0 and 2.0 per cent per year
D = Increase of more than 2.0 per cent per year

between the relative growth of labour productivity and the relative change in investment efficiency. Pulp and paper industries for instance have tended to be relatively less efficient in terms of labour productivity growth than in terms of change in IIORs, while the reverse applies for printing.

2.2. Patterns in factor proportions

As no data are available in the statistical yearbook of the CMEA on fixed assets by branches, we cannot identify capital intensities directly. As an alternative, we may accumulate gross investment by branches in absolute terms for a period of fifteen years and can take the relation to employment as indicative of the pattern of capital intensities (fixed assets per employee) (Table 20).

The ratios vary greatly between branches, while a great similarity is evident between country patterns.[1)] Chemicals, pulp and paper and construction materials are generally characterized by a relatively high level of capital intensity, while light industries, wood and wood processing, glass and printing are branches of relatively low capital intensity. Only in Hungary do printing and glass show a capital intensity that is somewhat above the national average.

It is notable that machine building - especially in the more advanced countries - shows a below-average level of relative capital intensity; only in Romania is this ratio slightly above the national average. Also the relatively high capital intensity in food industry is noteworthy. In all countries except Bulgaria this level is above the national average. In other words, with the exception of Bulgaria capital per employee is relatively lower in machine building than in food industry.

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1) Considering the high level of aggregation involved, a part of the differences may be due to differences in product mix rather than to differences in the ratio itself.

Table 20

Pattern of capital intensity,[1] 1965-1979 (Total manufacturing = 100)

	GDR	Czechoslovakia	Soviet Union	Hungary	Poland	Bulgaria	Romania
Machine building and metal processing	75	73	89	71	97	98	104
Chemicals and rubber	220	325	301	272	230	140	353
Construction materials	185	212	129	212	151	186	147
Glass, china and ceramics	.	80	66	126	70	83	85
Wood and wood processing	.	89	66	46	66	46	42
Pulp and paper	.	223	283	240	207	175	175
Printing	.	94	.	118	57	71	28
Textiles and knitwear	55	74	65	70	58	49	51
Clothing	.	18	9	18	15	13	12
Leather, furs and footwear	.	39	39	32	28	22	19
Food (incl. beverages and tobacco)	114	132	124	140	113	89	109

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1) Cumulated investment (1965-1979) per employed person in 1979.

Similar branch patterns emerge if we look at the relative levels of investment intensities of the individual countries in 1965, 1970 and 1979 (Table B.4). To illustrate the intertemporal development of the average levels of gross investments per employee for the area as a whole, we divided the fifteen-year period under consideration into three five-year subperiods. The figures reveal a diminishing dispersion of the level of investment per employee over time, mainly because there is a slow-down in the share of investments in the generally heavily capital-using branches - chemicals and pulp and paper (see Table 21 and the chart to this table). Despite this decline these branches remain by far the most investment intensive. Above-average levels of relative investment intensity are also observed in construction materials and in food industry, where an increasing tendency is shown in the second half of the 1970s.

Relative investment intensity in machine building was below average but reveals a strengthening tendency over time.

In the remaining branches - printing, wood and wood processing, textiles, clothing and leather - investment intensity was generally well below average; glass industry exhibited a slightly above-average investment intensity in the earlier period, but it declined afterwards. The relative level of investments per employee in clothing industry was by far the lowest in all CMEA countries.

In the area as a whole investment intensity in manufacturing industry rose by 6.5 per cent a year since 1965 (Table B.5). The development was more rapid in the less developed countries, Romania (18.9 %), Bulgaria (7.5 %), Poland (7.2 %) and less pronounced in the industrially more advanced countries. While a significant correlation with development levels is indicated, it should be noted that investment intensity expanded slower in the Soviet Union (4.4 %) and faster in the GDR (5.8 %) and in Czechoslovakia (5.1 %).

There are only a few branches where investment intensity declined during the period considered. This was the case in the pulp and paper

Table 21

Area average (unweighted)
of national levels of investment intensity in five-year periods
(Total manufacturing = 100)

	1965-1969	1970-1974	1975-1979
Machine building and metal processing	82	83	89
Chemicals and rubber	348	291	266
Construction materials	166	191	172
Glass, china and ceramics	109	92	71
Wood and wood processing	54	61	63
Pulp and paper	232	241	199
Printing[1)]	61	79	76
Textiles and knitwear	59	67	59
Clothing	13	16	13
Leather, furs and footwear	32	31	28
Food (incl. beverages and tobacco)	113	114	122

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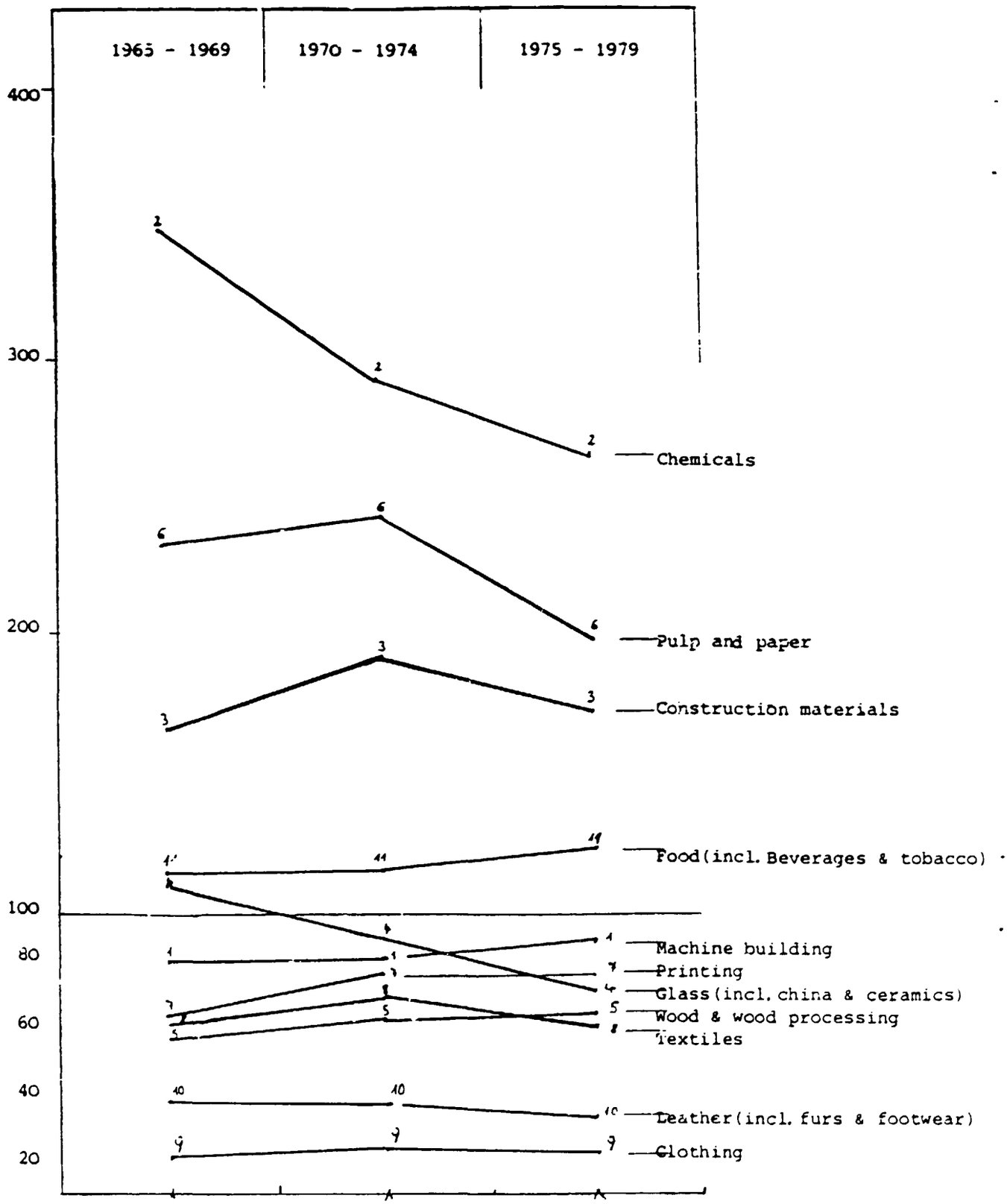
1) Excluding GDR and Soviet Union

Chart to Table 21 .
Gross investment per employee (unweighted area averages)
(Total manufacturing = 100)



industry of Bulgaria, Romania and Hungary, in Bulgaria's glass industry and in the chemical industry of Czechoslovakia.

The fastest rates of growth of investment intensity in manufacturing industry where observed during the second half of the 1960's. The development of investments per employee decreased appreciably in most countries in the first half of the seventies, whereas a steep increase of the growth rate of investments per employee can be indentified in this period in Poland.

A more dynamic growth of investment intensity in total manufacturing industry can be indentified in Bulgaria, Romania and the GDR in the period 1976 to 1979, as compared with the first half of the 1970s. In the GDR this is mainly the result of the declining investment intensity in the first half of the seventies. In this period investment intensity increased in the country's textile and food indutry, while it declined markedly in the remaining branches for which data are available (machine building, chemicals and construction materials).

In Bulgaria the general increase of investment intensity in the period 1976-1979 favoured only a few branches - machine building, chemicals, construction materials and to a lesser extent printing - while investments per employee declined sharply in all other branches, especially pronounced in light industry. In Romania the branch distribution of the development of investments per employee is more balanced in this period, though light and food industries are also less favoured.

After an unprecedented and not properly digested investment boom in the early 1970s Poland experienced an extraordinary decline of investment intensity during the period 1976 to 1979 in total manufacturing industry as well as in almost every branch. The rate of growth of investment intensity was positive only for chemicals, glass and wood and wood processing. In the short run this did not influence the growth of output or labour productivity to a marked extent, since the completion of lagging investment projects still increased the productive capacity during this period.

Table 22

Investment intensity: rates of growth and ranking by branches, 1966-1979

	Average unweighted growth rate	Coefficient of variation	Average rank of growth rate	Standard deviation of average rank	Rank order of average rank
Machine building and metal processing	7.9	0.37	3.7	1.49	1
Chemical and rubber	4.0	0.71	8.5	1.89	11
Construction materials	7.9	0.52	4.8	3.16	2
Glass, china and ceramics[1)]	4.9	1.18	7.3	3.45	9
Wood and wood processing[1)]	5.8	0.45	5.2	3.34	5
Pulp and paper[1)]	1.6	3.20	8.2	3.67	10
Printing[2)]	8.1	0.73	6.0	3.89	6
Textiles and knitwear	5.7	0.46	7.0	1.53	8
Clothing[1)]	6.2	0.43	5.0	2.31	3
Leather, furs and footwear[1)]	5.3	0.44	6.2	2.67	7
Food (incl. beverages and tobacco)	7.0	0.32	5.1	1.64	4

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1) excluding GDR
2) excluding GDR and Soviet Union

Differences between branches in the growth rate of investment intensity are rather large, ranging from about 8 per cent annually on average for the whole area in machine building, construction materials, and printing down to 1.6 % in pulp and paper (Table 22).

In considering the ranking pattern it should be noted that the development was not uniform in the individual countries. Machine building, construction materials and clothing assumed the highest average rank, though clothing for instance ranked second in Poland, but only ninth in Romania. Chemical industry, pulp and paper and glass show the lowest average ranks, but here also the spread between countries is generally high.

It is notable that the ranking order of the development of investment intensities in the individual countries rather closely approximates those of the incremental gross investment-output ratio (Table 23). Both aggregate indicators depend basically on the development of investment and thus reflect the backward and forward move in investment policies. A rapid expansion of investment per employee in the various branches was generally accompanied by a declining investment efficiency and vice versa. There are only a few cases where these diminishing returns of additional capital per employee do not appear. In most countries the rank order of machine building is markedly lower in terms of growth rate of investment intensity than in incremental gross investment-output ratio. Marked exceptions (more then tow places) are also found in the leather industry in Hungary and in the food industry in Czechoslovakia and Poland where the growth rate of investment intensity ranked higher than the growth rate of the incremental gross investment-output ratio, and in Romania's construction materials industry where the opposite is true. Further we note that, with very few exceptions, the branches of light and food industries rank at least one place higher in terms of development of investment per employee than in terms of the growth rate of the incremental gross investment-output ratio.

Table 23

Ranking order of branches in terms of the development of the investment intensity (Ii) and the IIOR, 1966-1979

	GDR		Czechoslovakia		Soviet Union		Hungary		Poland		Bulgaria		Romania	
	Ii	IIOR	Ii	IIOR	Ii	IIOR	Ii	IIOR	Ii	IIOR	Ii	IIOR	Ii	IIOR
Machine building and metal processing	3	4	6	9	1	7	5	8	4	7	3	5	2	2
Chemical and rubber	5	5	11	11	8	8.5	10	10	9	10	6	7	6	8
Construction materials	4	3	5	6	6.5	6	2	2	10	9	1	2	3	6
Glass, china and ceramics	.	.	10	10	9	10	6	7	6	8	11	11	1	1
Wood and wood processing	.	.	1	3	5	4	8	9	1	3	5	4	10	9
Pulp and paper	.	.	3	1.5	10	8.5	11	11	3	1	10	10	11	11
Printing	.	.	9	8	.	.	1	1	11	11	2	1	7	5
Textiles and knitwear	1	2	8	7	4	3	7	6	8	6	9	9	5	4
Clothing	.	.	4	5	3	2	4	3	2	4	7	6	9	10
Leather, furs and footwear	.	.	2	1.5	2	1	9	5	7	5	8	8	8	7
Food (incl. beverages and tobacco)	2	1	7	4	6.5	5	3	4	5	2	4	3	4	3

2.3 Correlations between different growth indicators

The inter-sectoral analysis indicates a strong correlation between the average annual growth rate of output and employment, output and labour productivity (Table 24). While output performance in the least developed countries Romania and Bulgaria is more strongly correlated with the growth rate of employment than with labour productivity, the opposite is true for all other countries except the GDR, where no significant correlation between the growth rate of output and labour productivity is in evidence, which can be explained by the inverse correlation between the development of employment and labour productivity in this country.

The coefficients of correlation between the development of output and investment, output and investment intensity and labour productivity and investment are slightly positive only for the Soviet Union, Poland, Bulgaria and Romania, whereas they assume a negative value for the GDR, Czechoslovakia and Hungary. This must, of course, be interpreted with caution, remembering that the coefficient of correlation does not measure causality but only co-variability. The conclusion that a high rate of growth of investment has a depressing impact on the growth rate of output or labour productivity is not persuasive. The weak and, for some countries, negative inter-sectoral relationship between these growth indicators tells us merely that in all countries there were branches showing a relatively dynamic development of investment or investment intensity, whereas the growth rates of output or labour productivity in these branches were lagging behind. But another root of the weak influence of additional investments on output and labour productivity may well be the organizational system in the CMEA countries which migh inhibit a better management of larger investment flows.

A similar picture emerges in respect of the association between the development of labour productivity and investment intensity, which is also generally weak, and even negative for the GDR, Hungary and Poland.

The relationship between the growth rates of investment and employment, and employment and labour productivity are not very persuasive for most

Table 24

Linear coefficients of correlation[1] between average annual growth rates (1966-79) of specified variables[a] by country

	O/E	O/Lp	O/[illegible]	O/Ii	I/E	E/Lp	O/IIOR	I/Lp	Lp/Ii	Lp/IIOR	I/IIOR
GDR	0.67	0.17	-0.27[2]	-0.69[2]	0.40[2]	-0.62	-0.90[2]	-0.71[2]	0.33[2]	-0.60[2]	0.66[2]
Czechoslovakia	0.61	0.90	-0.47	-0.58	-0.12	0.21	-0.75	-0.51	-0.53	-0.75	0.94
Soviet Union	0.89	0.93	0.50	0.11	0.53	0.67	-0.45	0.40	0.11	-0.49	0.54
Hungary	0.56	0.80	-0.09	-0.24	0.03	-0.05	-0.48	-0.13	-0.11	-0.44	0.92
Poland	0.81	0.93	0.30	0.04	0.63	0.55	-0.43	0.04	-0.17	-0.63	0.73
Bulgaria	0.94	0.85	0.44	0.07	0.30	0.61	-0.16	0.56	0.33	0.06	0.81
Romania	0.88	0.69	0.64	0.37	0.73	0.28	0.12	0.19	0.10	-0.25	0.84

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1) significance levels: .01 when $r > .68$; .1 when $r > .48$
2) referring to five branches only, significance levels: .01 when $r > .87$; .1 when $r > .67$

a) O = Gross output
E = Employment
I = Investment
Lp = Labour productivity
IIOR = Incremental gross investment-output ratio
Ii = Investment intensity

countries, in view of differences in branch behaviour. The growth rate of labour productivity is inversly correlated (with the exception of Bulgaria) with the development of the IIOR, i.e. a relatively favourable development of labour productivity in some branches was associated with a relatively favourable development of investment efficiency, and vice versa. The same is true, with the exception of Romania, for output growth and the development of IIOR. Finally one notes quite a strong correlation between the growth rates of investment and the average annual percentage change of the IIOR in almost all countries, implying a diminishing marginal efficiency of additional investments.

Although the results of the inter-country analyses are, on the whole, rather similar to those mentioned above, some differences may be noted. The coefficient of correlation between the various growth indicators show quite strong associations for total manufacturing industry - with the exception of output and investment efficiency and labour productivity and investment efficiency - while this is generally not the case when the individual branches are considered (Table 25).

Output performance is generally more strongly correlated with the expansion of manpower than with the development of labour productivity. The only branches where this is not apparent are construction materials and pulp and paper. The inter-country association between the development of employment and investment is strong for total manufacturing industry as well as for machine building, chemicals, glass, wood and wood processing, and textiles, but not for the remaining branches. For pulp and paper this association is even negative. The same picture emerges with regard to output and investment.

The association between the development of output and investments per employee is significant only for machine building and to some extent for the glass industry, while it is very weak for the other branches and inversely correlated in pulp and paper, clothing and leather industry.

In contrast to the inter-sectoral analyses for total manufacturing industry as well as for most branches there is no association evident

Table 25

Linear coefficients of correlation[1] between average annual grow
of specified variables[a] by branch

	O/E	O/Lp	O/I	O/I;	I/E	E/Lp
Total manufacturing	0.96	0.90	0.95	0.80	0.93	0.73
Machine building and metal processing	0.93	0.81	0.90	0.84	0.97	0.55
Chemical and rubber	0.94	0.82	0.80	0.53	0.84	0.57
Construction materials	0.81	0.94	0.49	0.25	0.17	0.57
Glass, china and ceramics	0.75	0.66	0.71[2]	0.64[2]	0.84[2]	-0.02
Wood and wood processing	0.68	0.10	0.64[2]	0.45[2]	0.71[2]	-0.66
Pulp and paper	0.85	0.88	-0.50[2]	-0.68[2]	-0.23[2]	0.51
Printing	0.93	0.64	0.45[2]	0.25[2]	0.42[2]	0.31
Textiles and knit-wear	0.96	0.55	0.75	0.10	0.75	0.28
Clothing	0.87	0.79	-0.06[2]	-0.71[2]	0.31[2]	0.38
Leather, furs and footwear	0.91	0.83	0.20[2]	-0.29[2]	0.31[2]	0.53
Food (incl. beverages and tobacco)	0.57	0.53	0.50	0.47	0.55	-0.39

1) Levels of significance: .01 when $r > .8$; .1 when $r > .58$
2) excluding GDR

a) see footnote to previous table

th rates (1965-79)

O/IIOR	I/Lp	Lp/I;	Lp/IIOR	I/IIOR
0.60	0.91	0.84	0.62	0.82
0.51	0.51	0.47	-0.02	0.83
0.16	0.50	0.34	-0.12	0.73
-0.25	0.59	0.41	-0.09	0.73
0.54[2)]	-0.09[2)]	-0.05[2)]	-0.23[2)]	0.98[2)]
0.31[2)]	-0.06[2)]	-0.06[2)]	-0.21[2)]	0.93[2)]
-0.76[2)]	-0.63[2)]	-0.70[2)]	-0.80[2)]	0.94[2)]
0.23[2)]	0.09[2)]	0.15[2)]	0.04[2)]	0.97[2)]
-0.08	0.57	0.50	0.19	0.59
-0.80[2)]	-0.47[2)]	-0.68[2)]	-0.88[2)]	0.65[2)]
-0.53[2)]	-0.04[2)]	-0.33[2)]	-0.61[2)]	0.72[2)]
0.21	-0.20	-0.10	-0.47	0.93

between the growth of output and changes in the incremental gross investment-output ratio. Exceptions are pulp and paper and clothing industry, where the correlation is strongly negative, i.e. a relatively high growth rate of output was associated with a relatively favourable development of investment efficiency. A weak negative association appears also for construction materials and for the other light industrial branches.

The correlation between the development of labour productivity and investments and labour productivity and investment intensity, though positive for total manufacturing industry, is generally not indicated for the individual branches. A slightly negative correlation between these indicators is a common feature for glass, wood and wood processing, pulp and paper, clothing, leather and food industries. This means that countries where investment intensity developed relatively dynamically in these branches experienced smaller productivity gains.

The inter-country association between the growth rate of labour productivity and the incremental gross investment-output ratio is negative for most branches, but a strong inverse correlation is apparent only in wood and wood processing, and clothing.

Finally, there is a very strong association indicated between the growth rate of investment and the rate of change in the incremental gross investment-output ratio. Dynamically growing investments are associated with a relatively less favourable development of investment efficiency.

For the area as a whole a historical background analysis of some of the relationships discussed above yields some notable findings. In the very early development period (1966-70) differences in the growth rate of output were similarly strongly related to differences in the expansion of manpower as to labour productivity gains. With the slow-down of growth of labour supply the extent to which differences in output growth

were associated with different growth rates of employment became smaller[1]. Thus labour productivity came to play a greater role in determining differences in output growth in the second half of the seventies. The correlation analysis between the growth rate of employment and labour productivity gains does not reveal significant results in any subperiod. For the period as a whole the estimated coefficient of correlation between employment and labour productivity is significant at the .01 level but not strong (Table 26).

Table 26

Coefficients of correlation

	1966-79	1971-75	1976-79	1966-79
Output / employment	0.75	0.71	0.64	0.85
Output / labour productivity	0.77	0.61	0.79	0.81
Employment /labour productivity	0.16	-0.13	0.04	0.38

The proportion of output growth accounted for by the increase in labour productivity is frequently used as an efficiency index, whether an "intensive" or an "extensive" growth strategy was pursued. Detailed data can be found in Table B.6 while they are summarized in Table 27. The following results are suggested:

In total manufacturing industry, labour productivity contributed most to output growth in Czechoslovakia and Hungary and least in Romania (Tables 27 and B.6). The contrasting experiences are to a large part based upon different conditions of availability of labour resources. But there are also differences between countries where these conditions were fairly similar, specifically between the GDR and Czechoslovakia on the one hand, Bulgaria and Romania on the other. The differences between the GDR and Czechoslovakia result mainly from the development during the

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1) The regression analysis reveal the following equations:

1966-1970	1971-1975	1976-1979
E = -1.03+0.46 O	E = -1.88+0.54 O	E = -1.62+0.38 O
Lp = -1.28+0.49 O	Lp = 2.11+0.41 O	Lp = 1.73+0.60 O,

where E = Employment; O = Output; Lp = Labour productivity.

Table 27

Proportion of output growth accounted for by growth of labour productivity (in percentages)

	Area average				Deviation from average, 1966-1979						
	1966-70	1971-75	1976-79	1966-79	GDR	Czecho-slovakia	Soviet Union	Hungary	Poland	Bulgaria	Romania
					in percentages points						
Total manufacturing	63	70	88	71	-2	10	0	10	1	-3	-15
Machine building and metal processing	60	66	81	67	-3	14	3	11	1	-5	-19
Chemicals and rubber	65	6	88	70	5	6	0	9	7	-13	-16
Construction materials	80	83	111	85	-17	0	-12	35	11	-7	-9
Glass, china and ceramics	67	57	76	65	-6	10	10	-4	9	-1	-19
Wood and wood processing	94	71	128	90	-44	-8	19	31	-13	23	-8
Pulp and paper	56	63	111	66	-6	-7	0	4	21	-15	4
Printing	88	84	98	87	35	-5	-20	0	-4	-28	25
Textiles and knitwear	81	87	121	93	41	0	-9	43	-7	-26	-44
Clothing	55	69	127	68	22	29	-9	-29	0	8	-19
Leather, furs and footware	51	71	188	70	9	6	8	-3	-5	3	-17
Food (incl. beverages and tobacco)	57	73	91	70	-19	8	15	-6	-4	24	-14

period 1970 to 1975 when the GDR accomplished a second wave of nationalization, embracing the small and labour intensive enterprises, which have not been included in the statistics before.

In 1966-1970 Romania and Bulgaria show equal proportions attributable to productivity gains. Despite their common heritage of backwardness Bulgaria succeeded in the seventies, much more than Romania, in attaining growth through increases in labour productivity. Romanias economic organization is and has been highly centralized. Some slight decentralization in industry (and also in foreign trade) lasted from 1969 through 1972, but disappeared quickly after the National Party Conference in July 1972. What followed was a very ambitous remobilization of the economy and even higher rates of growth of employment in manufacturing industry. The organizational system did not seem to manage this increase in manpower well.

The higher or lower than average proportion of growth attributable to productivity changes in the individual countries cannot be registered in every branch of these countries. Thus Czechoslovakia shows a lower than average proportion of output growth accounted for by increases in labour productivity in wood and wood processing, pulp and paper, and printing. For Hungary the same is true for glass, clothing, leather and food. Romania exhibits the most uniform picture: labour utilization was less favourable than on average in all branches except in pulp and paper, and printing. In all remaining countries, where the proportion of output growth attributable to productivity changes for total manufacturing industry corresponded approximately with the area average, there were a number of branches where this proportion was either higher or lower than average.

Differences between branches in the proportion attributable to productivity changes were rather small on the whole. Only four branches stood out - construction materials, wood and wood processing, printing and textiles - where this proportion was generally more favourable than for total manufacturing.

A sharply rising trend over time in the proportion attributable to productivity changes is indicated in every branch. This rising trend was generally more pronounced in light and food industries. In total manufacturing the proportion of output growth attributable to gains in labour productivity rose from 63 per cent in the period 1966-1970 to 88 per cent in the period 1976-1979 (unweighted area average).

3. Future perspectives of structural change

3.1 Determinants of structural patterns

The patterns of growth and structural change in the CMEA countries were evidently related to the rise in per capita income which took place at the same time. The relationship between the increase in per capita income and structural changes is generally seen as follows: The volume and pattern of demand changes - in particular, investment demand rises - and, partly related to this, there are shifts in technological coefficients of production including changes in inter-branch input-output flows. Changes in the relationship between exports and imports pertaining to the various branches are assumed to contribute to structural changes in a similar manner.

What holds true for the inter-temporal development of the structure of gross output should of course apply also to inter-country differences in structure. But here there may be differences in natural resource endowment and other factors promoting comparative advantages in a given branch which may have a strongly modifying influence.

To some extent this modifying influence may be reflected in the pattern of investment demand, which may thus differ between countries with a comparable per capita income level. It will probably find stronger expression in the foreign trade position (relationship between exports and imports) of a given branch, which may thus assume an important role in determining inter-country differences in the structure of output. However, as mentioned above, export and import statistics of the CMEA countries are only available in "foreign trade prices" and in a breakdown which is different from that in industrial statistics. Thus a quantification of the relationship between branch shares and pertinent foreign trade positions or foreign trade dependences is affected by a large margin of error and was postponed to a later stage of the analysis.

Differences in per capita income levels had been more pronounced in the

earlier period than during the second half of the 1970s and - as we know from the discussion above - structural differences between countries were wider at the beginning of the period investigated than at the end. Given the interrelationship between branch shares and income levels, a narrowing down of inter-country differences in income evidently contributed towards a greater similarity in output structures. A declining degree of interbranch specialization in foreign trade might have been working in the same direction.[1)]

If there were a strong similarity between the patterns of growth over time and inter-country differences in structure related to differences in relative income levels, one would expect lower shares of machine building and chemicals in less industrialized countries and higher ones in the industrially more advanced countries. In Czechoslovakia and Bulgaria structures by gross output were indeed broadly in line with those expected, while differences in these shares among the other countries cannot be explained very satisfactorily by income levels.

The inverse relationship between the shares of textiles, clothing and food industry and the ranking of countries according to their development level is generally more pronounced. These branches share the characteristic of producing, to a considerable degree, final goods, i.e. goods for which the pattern of domestic demand is largely determined by factors relating to income levels. But here, too, the foreign trade position may well have had a counteracting influence. The low share of the Romanian food industry represents an unexplained exception.

While domestic elasticities of demand seem to be generally influenced by elements relating to income, the relationship between inter-country differences in shares and income levels remains inconclusive, especially for branches producing predominantly, or to a large part, intermediate goods for either domestic processing or exports.

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1) Such a tendency was observed for the period 1950-1970, cf. Structure and Change in European Industry, ECE, New York 1977.

This suggests that, apart from distortions in the data, an approach which would seek an explanation of output growth and structural change primarily in changes of aggregate demand would not come to really satisfactory results. Other factors must form part of the explanation of inter-country differences in branch shares. These seem to be influenced to a large part by technical coefficients, which differ from country to country, further by the availability of natural resources and by structural policy. The growth pattern as well as structural differences may reasonably be seen as the result of the volume of inputs of capital and labour and their allocation among branches - which is not so much induced by demand factors but represents, to a large extent, government economic policy.

Thus, otherwise than in market economies, the theory of a demand determined structure of output seems to be less adequate for planned economies. It must rather be assumed that the allocation of factors of production (especially investment) and consequently the structure of output are primarily determined by planners' preferences.[1)]

3.2. Time trends in growth and the resulting changes in gross output structure

Since aggregate demand was regarded as inadequate as an explanatory variable for an extrapolation of the output structure, other approaches were investigated and some results of several trend analyses, performed by means of regression equations (fitting them to annual data) are reported.

The starting point of the first exercise was the question whether one could find some statistical relationships which explain the differences in growth elasticities of a given branch in the various countries.

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1) The opposite is suggested by N. Kaldor for market economies regarding investment as induced by, inter alia, economic growth: cf. N. Kaldor, "Capital Accumulation and Economic Growth" in: "The Theory of Capital", London, 1961

A major characteristic of these differences was the tendency towards convergence, in other words of rendering output structures more alike. This implies, of course, a relationship between the pattern of "specialization" in the initial period, and intercountry differences in the growth elasticities of various branches. Generally, a higher share of a given branch (compared with the corresponding share in other countries) was associated with a lower growth elasticity (again compared with the growth elasticity of the given branch in other countries) and vice versa. This means that growth elasticities in the 1980s will not remain as they have been on average during the period 1966 to 1979. But one would expect to find some definite tendencies in the behaviour of growth elasticities in relation to changes in total manufacturing growth rates as well as in the pattern of change in the growth elasticities of the various branches over time. In this case an attempt to define past trends and to project these trends up to the year 1990 would be of interest, because it could provide an indication of what the industrial gross output structure in the area may look like by 1990, if the trends which prevailed in 1966-1979 remain unchanged during the 1980s.

Indeed, in the individual countries there have been some branches where the growth elasticity generally fell with the deceleration of the growth rate of total manufacturing industry, and other branches where the opposite happened. But in most cases the results of the regression analysis have not been significant. This applies to annual data; a better fit could probably be attained when using moving five-year averages. This remains to be investigated at a later stage.

Anyway, the impression gained is that inter-country differences in elasticities were only partly due to differences in growth rates of total manufacturing output. They appear to have been determined mainly by factors specific to each country.

Beyond that, the analysis of time trends in growth elasticities performed by means of regression equations (again fitting them to annual

data) did not bring significant results (only in a few cases was the coefficient of correlation for the estimated function about 0.3) and is therefore not indicative of the behaviour of growth elasticities in the future. A projection with the estimated trend equations would result in an unrealistically sharp increase in the share of machine building at the expense of other branches in all countries except Hungary, were the lead of chemicals over the country's machine building industry would increase.

Since the regression of growth elasticities on growth of total manufacturing industry turned out to be insignificant in most cases and an extrapolation of time trends in branch growth elasticities would result in highly unrealistic projections, another approach was adopted, which a priori secured a slowdown in the implied growth rates and may reasonably be taken as a possible yardstick of future development: past time trends of output indices have been estimated for all branches and extrapolated up to 1990. The findings of this exercise allow the calculation of projected average annual growth rates for the period 1980-1990 and the gross output structure in manufacturing industry by 1990,[1)] which of course are only meaningful if the historical growth trends of the individual branches continue. Finally, they provide an indication of how the growth elasticities may develop during the 1980s under the assumption that the trends of the weighted individual branches add up to the trend growth rate of total maufacturing industry.

To beginn with the overall features based on unweighted area averages (Table 28), one may note, first, quite a strong tendency for the growth elasticity of the machine building, chemicals and (less pronounced) glass industry to decline in the following decennium.

But as they would remain above unit like in the period 1966-1979, the share of gross output of these branches would continue to increase till

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1) The actual gross output structures in 1979 have been used as weights for the projected growth indices of the branches in 1990 (1979=100) to arrive at the new gross output structure in 1990.

Table 28

Actual and projected growth elasticities and gross output structure

Area average (unweighted)	Growth elasticity		Share of manufacturing output (in percentage)		Coefficient of variation	
	1966-1979 actual	1980-1990 projected	1979 actual	1990 projected	1979 actual	1990 projected
Machine building and metal processing	1.32	1.12	42.0	44.1	0.07	0.06
Chemicals and rubber	1.37	1.14	12.9	13.6	0.19	0.21
Construction materials	0.85	0.90	3.8	3.7	0.28	0.30
Glass, china and ceramics	1.14	1.06	1.2	1.2	0.40	0.39
Wood and wood processing	0.74	0.87	4.2	4.0	0.14	0.14
Pulp and paper	0.90	0.93	1.5	1.4	0.36	0.36
Printing	0.92	0.94	0.7	0.7	0.52	0.55
Textiles and knitwear	0.73	0.82	8.1	7.6	0.21	0.23
Clothing	0.85	0.89	3.9	3.7	0.37	0.39
Leather, furs and footwear	0.75	0.84	2.2	2.0	0.19	0.20
Food (incl. beverages and tobacco)	0.63	0.78	19.7	17.9	0.16	0.16

1990, though at a far less pronounced rate. Contrary to this the growth elasticity of all other branches which have been below-unit during the period 1966-1979 would tend to increase during the 1980s. This means that the importance of these branches would not decline as rapidly as in the past.

By 1990 machine building and chemical industries taken together would account for some 58 per cent of total manufacturing output on average against some 55 per cent at the end of the 1970s. The share of the textile, clothing and leather industries together would decline from 14.2 per cent to 13.3 per cent and that of food industry from 19.7 per cent to 17.9 per cent.

The projected figures imply a further marked slowdown in the rate of structural change and a slackening of the movement towards convergence. In the case of some branches it would even imply a slight tendency towards greater dispersion of shares (chemicals, construction materials, printing, textiles, clothing; cf. Table 28). It remains to be seen whether this may mean somewhat rising opportunities for trade specialization between branches as compared with the present.

The projected trends in branch growth rates of the individual countries between 1980 and 1990 show a marked deceleration of manufacturing growth rates, which is the result of a declining tendency of all branch growth rates (Table 29). The growth rate of manufacturing industry in the 1980s would vary between 4.9 per cent (Romania) and 3.5 per cent (GDR and Hungary) annually. The average annual percentage change in branch shares would be relatively more dynamic in the Soviet Union and Bulgaria (about 0.7) and least dynamic in the GDR (0.4). In the remaining countries dynamics in structural shifts would amount to some 0.5 percentage points annually. This implies that the countries' gross output structures in 1990 would not be much different from those at the end of the 1970s.

Table 29

Projected branch growth rates between 1980-1990 (A) and the resulting shares of gross output in 1990 (B)

	GDR		Czechoslovakia		Soviet Union		Hungary		Poland		Bulgaria		Romania	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Machine building and metal processing	3.8	44.0	4.1	47.9	4.6	43.8	3.7	43.0	4.9	46.1	5.0	39.1	5.4	44.7
Chemicals and rubber	3.8	15.0	4.3	11.7	4.4	10.4	4.6	19.0	4.6	12.0	4.9	12.5	5.3	14.9
Construction materials	3.5	2.6	3.5	4.2	3.5	4.5	2.3	2.2	3.6	2.9	4.2	5.0	4.9	4.5
Glass, china and ceramics	3.7	1.4	3.7	2.0	4.4	0.7	4.1	1.5	4.7	1.3	4.2	1.1	5.0	0.6
Wood and wood processing	3.6	4.0	3.4	4.4	2.7	3.7	3.4	3.8	4.2	4.5	3.1	2.9	3.6	4.4
Pulp and paper	3.1	1.9	3.5	2.3	3.6	0.9	3.7	1.1	3.3	1.1	4.4	1.3	4.4	1.2
Printing	2.6	0.8	3.5	0.8	5.2	0.6	3.9	1.4	4.1	0.5	4.0	0.6	2.6	0.1
Textiles and knitwear	2.9	6.8	3.1	5.9	3.0	9.3	2.1	4.9	3.8	8.1	3.8	9.5	4.8	8.6
Clothing	2.9	2.2	3.0	2.0	3.6	5.0	2.6	2.7	4.2	3.9	3.7	4.4	5.0	5.9
Leather, furs and footwear	3.4	2.0	3.2	2.8	2.9	1.7	2.7	1.9	3.7	2.1	3.5	1.6	4.3	1.9
Food (incl. beverages and tobacco)	2.8	19.3	2.7	15.9	2.9	19.4	2.9	18.4	3.5	17.4	3.2	22.0	3.8	13.1
Total manufacturing	3.5	100	3.7	100	3.9	100	3.5	100	4.3	100	4.3	100	4.9	100
Dynamics in structural change[1]	0.39		0.49		0.71		0.51		0.52		0.69		0.49	

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1) measured by the coefficient displayed in Table 3.

3.3. The pattern of specialization at the branch level within the CMEA area

If one compares the inter-country ranking of manufacturing branches by share of gross output in 1965, 1979 and 1990 (based on projected figures) one finds a few notable shifts in ranks between 1965 and 1979, while the ranking pattern would hardly change thereafter (Table 30). However, already in analysing Western economies several problems crop up when we turn to this question. The problem of evaluation of output has already been brought up. Important differences between countries in inter-branch price relationships appear to exist even where prices are determined by market forces and the interaction between the levels of internal and external prices is fairly strong. Of course, problems of price structure are even more important in the centrally planned economies where prices are centrally determined and the link between internal and external price levels - if any - is weak.

In inter-country comparison of data based on gross output there is also the problem of differences in the extent of double counting, which is bound to arise as a result of differences in the organizational structure of industry, and which affects the comparability of the shares. Moreover, the available data on gross output are expressed in constant prices, whereas it is generally assumed that in analysing changes in the pattern of specialization over time it is better to use data expressed in current prices.

While it is recognised that the employment data do not have the above-mentioned shortcomings, it was thought preferable not to base the analysis of inter-country specialization on this indicator rather than on the available output data, because a relatively higher input of labour in a particular country into a given branch is not necessarily associated with a relatively higher output.

To obtain a general impression of the pattern of specialization within the area we will consider only the top and bottom ranks from the ranking

Table 30

Inter-country ranking of manufacturing branches by share of gross output

	G D R			Czechoslovakia			Soviet Union			Hungary		
	1965	1979	1990	1965	1979	1990	1965	1979	1990	1965	1979	1990
Machine building and metal processing	3	4	4	2	1	1	6	6	6	1	5	5
Chemicals and rubber	1	2	2	5	6	6	6	7	7	2	1	1
Construction materials	7	6	6	3	4	4	1	2	2.5	6	7	7
Glass, china and ceramics	2	2.5	3	1	1	1	7	6.5	6	3	2.5	2
Wood and wood processing	7	2.5	4	4	3	2.5	3	4	6	6	5.5	5
Pulp and paper	2	2	2	1	1	1	6	7	7	6	6	5.5
Printing	1	2.5	2.5	3	2.5	2.5	7	5.5	4.5	2	1	1
Textiles and knitwear	6	5	5	7	6	6	1	1	2	5	7	7
Clothing	6	7	6	7	6	7	3	2	2	5	5	5
Leather, furs and footwear	7	5	3	1	1	1	5	6	6	3.5	3.5	4.5
Food (incl. beverages and tobacco)	5	3	3	6	5	6	2	2	2	7	4	4

Table 30 continued

Inter-country ranking of manufacturing branches by share of gross output

	Poland			Bulgaria			Romania		
	1965	1979	1990	1965	1979	1990	1965	1979	1990
Machine building and metal processing	4	2	2	7	7	7	5	3	3
Chemicals and rubber	3	4	5	7	5	4	4	3	3
Construction materials	4	5	5	2	1	1	5	3	2.5
Glass, china and ceramics	4.5	4	4	4.5	5	5	6	6.5	7
Wood and wood processing	5	2	1	3	7	7	1	1	2.5
Pulp and paper	3	5	5.5	6	3.5	3	4	3.5	4
Printing	4.5	5.5	6	4.5	4	4.5	6	7	7
Textiles and knitwear	3	4	4	2	2	1	4	3	3
Clothing	4	4	4	1	3	3	2	1	1
Leather, furs and footwear	2	2	2	6	7	7	3.5	3.5	4.5
Food (incl. beverages and tobacco)	3	5	5	1	1	1	4	7	7

order assumed by the various branches when their shares in gross output are compared on an inter-country basis.

For the greater part of the period the GDR assumed a high rank (one of the two top ranks) in chemicals, pulp and paper and printing, Czechoslovakia in machine building, glass, pulp and paper and leather; the Soviet Union in construction materials, textiles and food; Hungary in chemicals and printing; Poland in leather and up to the second half of the 1970s in machine building and wood and wood processing; Bulgaria in construction materials, textiles and food; and Romania in wood and wood processing, and clothing. There is a notable similarity between the pattern of specialization in the Soviet Union and in Bulgaria (Table 30).

Evidently the present pattern of specialization within the CMEA area was determined, not so much during the period 1965 to 1979 but rather in the twenty-year period after the second world war. Structural aims always dominated economic policy in the centrally planned economies. The roots of the CMEA countries' structural policy were strongly instrumental in making up for historical backwardness according to the criteria of a "planned and well-proportioned development of the economy". The reshaping of the macrostructure was practically accomplished in most countries during the first half of the sixties, while afterwards, with the process of opening to the world economy, structural policy had to aim primarily at developing further the product structure on the intra-branch level. As the breakdown into 11 branches was the most disaggregated that was possible for the purpose of inter-country comparisons, the pattern of specialization within branches lies beyond the scope of the present research work.

A comparison of the inter-country ranking pattern in 1965 with that in 1979 according to the broad branch classification shows that there are not many branches where the ranking order of the shares over time changed by more than two positions. For Czechoslovakia no such change is indicated. In the GDR the increase in the rank of the food and leather industry is

notable. According to the projected figures the latter would improve its position further till 1990. The Soviet Union lost in the ranking of wood and wood processing, a tendency which is projected to continue. In Hungary, machine building and textiles became relatively less important and food industry relatively more important when compared with other countries. Poland moved up in machine building and wood and wood processing, where it would assume the first rank by 1990 while the opposite tendency is projected for in pulp and paper. Bulgaria improved her position in chemicals and pulp and paper, a tendency which is projected to continue, while the importance of wood and wood processing declined. Romania moved up in machine building and construction materials while her food industry now ranks last when compared with the share in other countries.

PART II - PATTERNS OF TRADE IN MANUFACTURES BETWEEN CMEA COUNTRIES AND DCs

1. Introductory remarks

Part I of the present study examined various aspects of structural changes in the manufacturing industries of the European CMEA countries. It would, of course, be of topical interest to investigate the interdependence, if any, of these changes with structural changes in the European CMEA countries' trade with the developing countries. However, there are no sets of data available that would allow us to establish such a link without extensive further research. Among the main problems besetting such a course are frequent inconsistencies and omissions in time series, different classifications, differing (and high) levels of aggregation and different price and currency bases used in trade and production statistics.

Quite apart from these statistical and methodological problems, we shall later in some detail show that trade between the European CMEA countries and the developing countries (briefly referred to as "East" and "South")[1] - and even more so trade in manufactures - has been of but marginal quantitative importance for both groups of countries, and seems rather to have had the character of a residual variable.[2] In view of this fact alone there is good reason to assume that the relationship between structural changes in the CMEA countries' manufacturing industries and the commodity composition in their trade with the South has been rather weak until now. Beyond that, the commodity composition of East-South trade in manufactures seems to have changed very little as compared with the substantial structural shifts in the CMEA countries' manufacturing industries.[3]

We believe that Part II, though not formally linked to Part I, can open up some interesting insights into the main features and developments of

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1) We are well aware of the controversial nature to these highly simplifying terms, but stick to their use for the sake of brevity. For an exact delimitation of the regional groupings, see the following pages.
2) The factors contributing there to will be dealt with in section three of part II.
3) Cf. pp. 9 ff and 106 ff.

East-South trade in manufactures. For a better understanding of its place in world trade, we shall start with a brief look at East-West-South trade patterns in section 2. East-South trade in manufactures proper will be dealt with in section 3. The basic observation period is 1965-1979 with special emphasis on the 1970s when drastic changes took place in the international economic environment of East-South trade. We shall mainly examine growth rates of mutual exports, the importance for both groups of countries of their mutual trade and its commodity composition. Sections 2 and 3 are largely based on a study by E. Palócz-Németh, "Der Handel in Industriewaren zwischen Ost, West und Süd und seine Auswirkungen", which was updated and enlarged.[1] Since East-South trade and industrial cooperation are closely linked phenomena, we shall devote a separate, fourth, section to industrial cooperation between the two regions. Finally, some general considerations regarding the perspectives of East-South economic relations will be presented in section 5.

The data basis of section 3 is taken from UNCTAD's Handbook of International Trade and Development Statistics for the years up to 1978 and from the UN's Monthly Bulletin of Statistics for 1979. It should be noted that figures are subject to frequent and substantial revisions from one to another edition of these sources and that, even in the latest editions of both, they show (non-systematic) deviations for identical years across the board. It is in Southern exports of manufactures to the East that the differences are particularly high, ranging from 0.4 % to 11 % in terms of current US $ values. The deviation of 11 % (US $ 118 mln.) for 1978 results in two completely contradictory growth rates for that year: according to UNCTAD it was minus 6 %, according to the UN Monthly Bulletin, plus 5 %. Statistical data published by UN organizations and bodies are based on the information supplied by the reporting countries which is incomplete in some cases and thus is supplemented by UN estimates.[2]

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1) Forschungsbericht No. 67 of the Vienna Institute for Comparative Economic Studies, January 1981.
2) More than one fourth of Eastern exports to the South are not amenable to statistical analysis: in adding up UN data for individual SITC groups 0 to 9 one arrives at a figure that is much lower than the UN figure given directly as total Eastern exports to the South. This lacuna is mainly due to Soviet trade statistics. (cf. Tiraspolski (1980), pp. 6, 27-29).

But it is not really intelligible why the outcome is so different. We conclude our remarks on the data oasis with the warning that East-South trade figures are by all appearance not very accurate and that, therefore, results should be treated with caution.

The main regions are defined as follows:

- "East": the seven European CMEA countries (Bulgaria, Czechoslovakia, GDR, Hungary, Poland, Romania and the USSR), occasionally subdivided into the six smaller countries, referred to as Eastern Europe, and the Soviet Union;
- "West": the OECD countries plus Yugoslavia, Israel and South Africa, but minus Turkey;
- "South": Asia (without Japan, the PR of China, Mongolia, the DPR of Korea and Vietnam), Africa (without South Africa), Latin America (including Cuba) and Oceania (without Australia and New Zealand). It is occasionally subdivided into OPEC countries and all other countries of the South, designated as NOPEC countries.

We disregard foreign trade of Albania, included in UN statistics in what we call the East, and of the socialist countries of Asia (see under South, above). The inclusion of Cuba in the South in UN usage results in higher values of East-South trade as compared with Eastern trade with developing countries that are not CMEA members and hence not subject to specific CMEA treatment. On the other hand, the CMEA members Mongolia and Vietnam (since 1978) are not taken account of in our framework.

For reasons of convenience we use the terms South, developing countries and Third World on the one hand and East, centrally planned economies, socialist countries and CMEA countries interchangeably if not explicitly stated otherwise.[1)]

The commodity structure data are based on SITC classification. Manufactures are understood to comprise industrial finished and semi-finished

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1) See also footnote 1, p. 84.

goods, i.e. SITC groups 5 to 8 with the exception of group 68 (non-ferrous metals), which corresponds to common usage.[1] The individual SITC one digit groups are as follows:

SITC 5 chemicals;

SITC 6 manufactured goods classified chiefly by material (mainly with a high content of raw materials and a relatively low degree of processing);

SITC 7 machinery and transport equipment;

SITC 8 other manufactured articles (mainly consumer goods).

A detailed treatment of the institutional framework of East-South trade would clearly go beyond the scope of this study. We therefore limit ourselves to a brief summary of its main characteristics. East-South trade is basically of a bilateral nature as is its institutional framework, consisting of a network of bilateral intergovernmental agreements. At the present time so-called long-term bilateral agreements on economic, scientific and technical cooperation exist between the CMEA countries and about 80 developing countries.[2] They define in general terms the fields, forms and conditions of cooperation envisaged by the contracting governments. The contents of these agreements are specified in more detail in special cooperation agreements relating to specific fields, possibly in bilateral programmes (which are still very rare) and in various other agreements, protocols and contracts.[3] In some cases, mixed intergovernmental commissions and their working groups are in charge of seeing to the agreements' implementation.

The portion of the CMEA countries' trade with the developing countries governed by long-term agreements has risen from 50-60 % in the mid-1960s to over 90 % at present.[4] In recent years the system of accounting and

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1) With the exception of some UNCTAD studies where the term is defined more broadly to include for example, food products (Palócz-Németh (1981), p. 5).
2) UNCTAD TD/B/806 (1980), p.6
3) ibid., p.6, Stefanov (1980), pp. 75-76. The more recent past witnessed tendencies (prevalent, too, in CMEA-integration) to extend the time horizon of bilateral agreements to up to 20-25 years and to provide for new fields and forms of cooperation.
4) UNCTAD TD/B/754 (1979), p. 14

payments between East and South has been subject to considerable changes in the direction of a multilateralization, meaning that the traditional system of bilateral clearing has been increasingly replaced or supplemented by multilateral arrangements, involving eventually payment in convertible currencies.[1] The principal idea in this policy switch was to enhance mutual trade, which under bilateral clearing is essentially limited by the less 'potent' partners' economic needs and potential. The number of clearing agreements between the two groups of countries fell from 150 in 1970 to 70 in 1977.[2]

According to UNCTAD estimates, 43 % of the CMEA countries' trade with the developing countries was transacted under convertible currency agreements in 1975, as against 23 % in 1965. This share is likely to have increased in subsequent years. As table 1 shows, the significance of bilateral clearing in trade with the South varies widely among the individual CMEA countries, the USSR, the CSSR and the GDR ranging on the more 'conservative' end of the line. Of the other socialist countries, Hungary transacted trade on the basis of clearing arrangements with only four developing countries in 1979 (Brazil, Pakistan, Bangladesh and Guinea), Poland with six countries (Brazil, Columbia, India, Iran, Lebanon and Nepal), and Bulgaria, too, with six countries (Brazil, India, Iran, Bangladesh, Pakistan and Ecuador).[3] It is interesting to note that a preference for bilateral clearing arrangements seems to prevail in trade with India and Brazil, which are among the most important trading partners of the East.[4]

In the pertainig Eastern literature much emphasis is put on the desirability of introducing multilateral elements in the organizational and

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1) Clearing agreements themselves were modified by increasing the limits of swing credits and/or accounting periods, by providing for the settlement of outstanding balances in convertible currencies or their transferability to third countries. Sometimes, certain transactions are carried out outside the (principally retained) bilateral clearing agreements and paid for in convertible currencies. (UNCTAD TD/D/703 (1978), p. 13).
2) Palócz-Németh (1981), p. 51.
3) Palócz-Németh (1981), p. 52. India and Hungary abandoned bilateral clearing in 1978 only.
4) UNCTAD TD/B/754 (1979), p. 11.

Table 1

Shares of trade turnover under clearing agreements in total trade turnover of CMEA countries with developing countries

	1965	1970	1975
		%	
Bulgaria	80.9	75.1	44.9
Czechoslovakia	67.7	69.0	61.1
GDR	81.3	84.0	56.2
Hungary	62.8	75.3	28.9
Poland	79.0	76.3	23.9
Romania	86.6	78.7	39.1
USSR	78.6	73.0	61.1
Total	77.1	75.1	57.0

Source: UNCTAD TD/B/703 (1978), p. 15, with reference to "Statistical review of trade among countries having different economic and social systems, prepared by the UNCTAD secretariat" (TD/B/656/Add. 1).

institutional framework as well. The most prominent instances of achievements in this field that regularly are made reference to are the two agreements between the CMEA as such on one side and Iraq and Mexico respectively on the other (both concluded 1975), the installation of a special development fund (in transferable roubles) in the International Investment Bank of the CMEA and of a CMEA scholarship fund for the training of specialists from developing countries (which started to operate 1974/75).

2. East-West-South trade patterns

In 1979, world trade (at current US $ prices) is characterized by the following main features:

- the West is by far the most important source and recipient of world exports, accounting for about two thirds of world trade;

- more than half of world trade is intra-regional trade;
- in inter-regional trade, flows between the West and the three other regions are biggest, followed, in this order, by trade between OPEC and NOPEC, NOPEC and East and between OPEC and East (diagram 1).

The 1979 network of world exports in manufactures shows that:
- the role of the West therein is even more important than in total trade. The West is the source of about four fifths and the recipient of two thirds of manufactures exports;
- the share of intra-regional trade in manufactures is higher (about two thirds) than in total trade;
- the ranking of the various inter-regional trade flows in manufactures is the same as in total trade (diagram .).

Among the most striking features of world trade in manufactures are the almost zero level of OPEC exports and the insignificance of NOPEC exports to the East.

In the 1970s, accoring to GATT statistics,[1] world exports more than quintupled in value terms and increased by 68 % in volume terms. The volume of world trade in manufactures even rose by 88 % over the same period, being the most dynamic flow of goods (table 2).

In about the last 15 years, the shares of West, South and East in world industrial production on the one hand and in world manufactures exports on the other hand showed divergent developments. Whereas the share in world industrial production of the West incurred a steady decline in that period, both the shares of East and South increased - the first much faster than the latter.[2] However, the share of the West in world manufactures exports remaining more or less unchanged at 83-84 % in the

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1) 1970-1979. GATT foreign trade data (at current prices) diverge somewhat from UN data. We chose to quote them above for the sake of conistency.
2) Palócz-Németh (1981), p. 6

years 1965-1979, the South roughly gained in ground what the East lost by increasing its share from 4.4 % to 8.9 % (East: 11.6 % to 7.6 %) (table 3).

A look at the development of market shares within the three regions (in terms of share of imports from a certain region in total manufactures imports, table 3) shows that in the period 1965-1979 intra-regional trade lost somewhat in importance in the West (from 94 % to 89 %) and to a considerable extent in the East (from 74 % to 59 %). On the other hand, intra-South trade, though still only at 13 % in 1979, gained in importance in the same span of time (1965: 7 %).

The West was able to maintain its market share on Southern markets at the high level of more than 80 % and greatly to strengthen its position on Eastern markets (from 23 % to 38 %). The CMEA countries in turn hold their market share on Western markets for manufactures at the low level of approximately 2 %, but lost on the markets of the developing countries (from 6 % to 4 %). Finally, the South increased its market share in the West (from 4 % to 8 %). Its role as supplier to CMEA-markets, having increased a little in the 1960s, lost in importance in the 1970s, falling to a mere 1.4 % in 1979 (table 3).

In the triangular relationship of East-West-South trade the East is, in a sense, in an intermediate position. This relates first of all to the level of economic development and industrialization. According to World Bank estimates, tentative though they are, GNP per capita of the European CMEA countries, with the exception of Romania, ranged between US $ 5670 for the GDR and US $ 3410 for Bulgaria in 1978. This is an income bracket that also embraces the less developed European countries and some of the more developed developing countries. Another aspect of the specific situation of the East is that it does not dispose of a plentiful and cheap labour supply as does the South, and not of a capital supply and technological level comparable to those of the West.[1] Finally,

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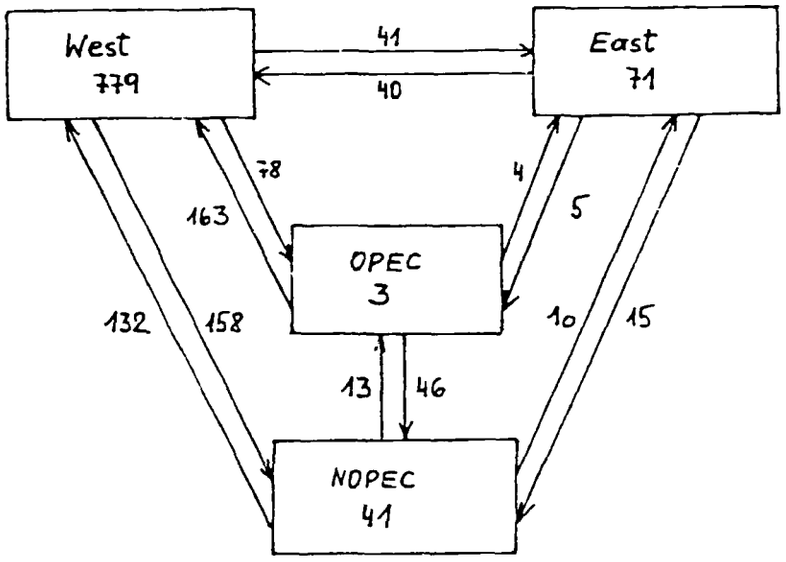
1) Palócz-Németh (1981), p. 3

Diagram 1

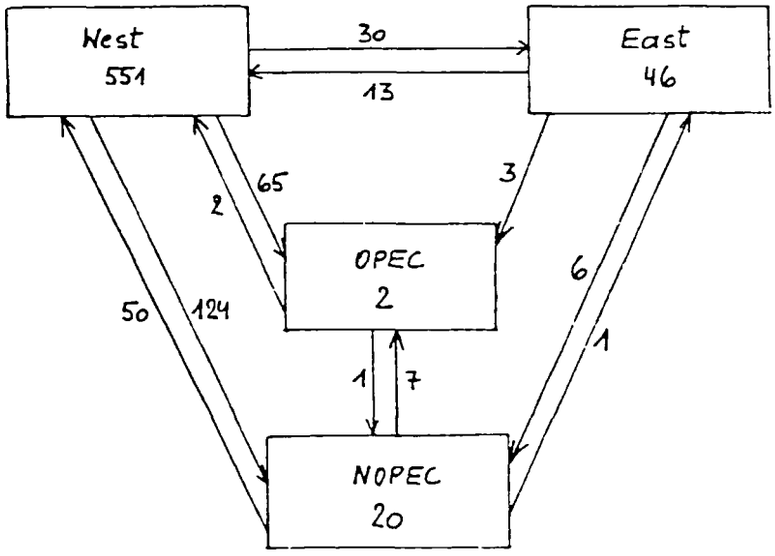
The network of world exports in 1979, billion US-$



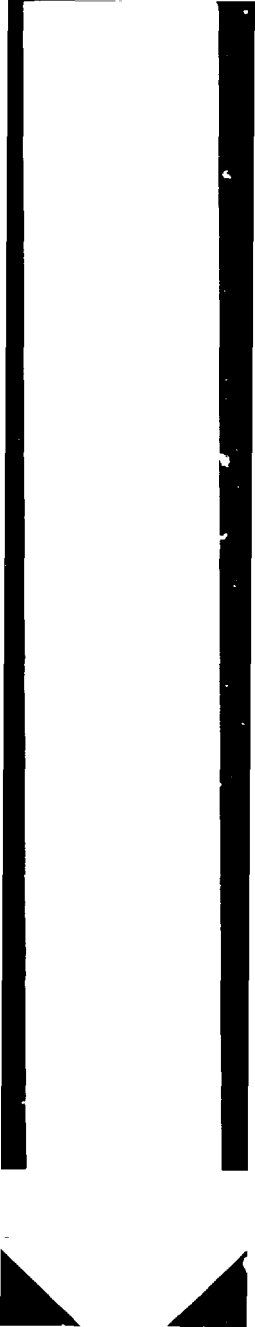
Source: UN Monthly Bulletin of Statistics, May 1981

Diagram 2

The network of world exports of manufactures in 1979, billion US-$



Source: UN Monthly Bulletin of Statistics, May 1981



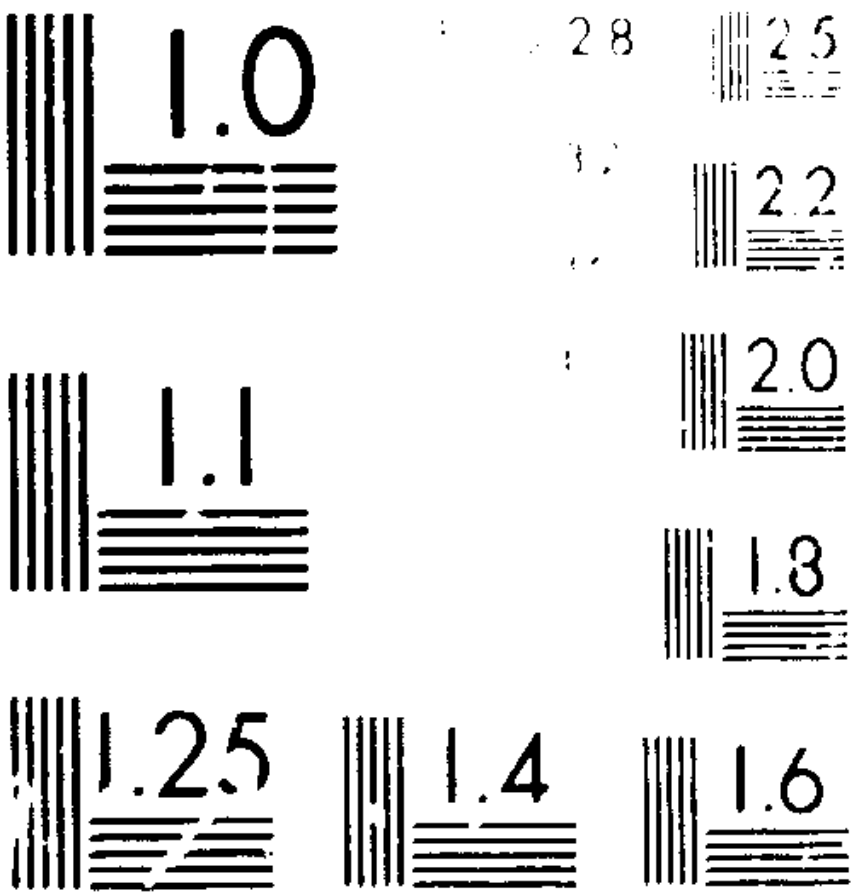

2.8
2.5
1.0
2.2
2.0
1.1
1.8
1.25
1.4
1.6

Table 2

Development of world exports by main commodity categories

(1970 = 100)

Value	1973	1974	1975	1976	1977	1978	1979
Agricultural products	189	231	234	259	295	332	406
Minerals[1)]	188	421	404	470	515	534	774
Manufactures	182	241	263	298	341	414	495
Total	184	267	279	317	360	406	521
Volume Agricultural products	109	105	111	118	122	126	133
Minerals[1)]	116	115	109	112	115	116	121
Manufactures	137	149	143	160	169	178	188
Total	130	135	130	145	151	159	168

Source: GATT, International Trade, 1977/78, p. 2, 1978/79 and 1979/80, appendices.

1) Including fuels and non-ferrous metals (SITC 68)

Table 3

Shares of individual regions in imports of manufactured goods by other regions (market shares)[1)]

(in %)

Imports		from the world	from the West	from the East	from the South
of the West	1965	100	93.7	2.2	3.8
	1970	100	93.3	2.0	4.6
	1975	100	91.2	2.2	6.3
	1979	100	89.2	2.1	8.3
of the East	1965	100	22.6	74.1	1.6
	1970	100	28.9	67.2	2.3
	1975	100	41.2	55.6	2.1
	1979	100	38.0	59.0	1.4
of the South	1965	100	84.2	6.3	7.4
	1970	100	84.0	5.9	8.5
	1975	100	86.0	4.1	8.8
	1979	100	81.5	4.0	12.9
of the world	1965	100	83.3	11.6	4.4
	1970	100	85.3	9.6	6.3
	1975	100	84.3	8.7	6.4
	1979	100	82.8	7.6	8.9

Source: UNCTAD Handbook of International Trade and Development Statistics, Supplement 1980, UN Monthly Bulletion of Statistics, May 1981.

1) Market shares are calculated on the basis of UN exports statistics.

the intermediate position of the East is reflected by the commodity composition of foreign trade. Roughly speaking, the South is to the East what the East itself is to the West, namely a supplier of raw materials and primary products and an outlet for manufactures, above all for investment goods.

3. East-South trade in manufactures

In the period 1965-1979 East-South trade turnover increased by somewhat less than eight times, reaching a value of US $ 33 billion in 1979. Mutual trade in manufactures expanded a little more slowly, increasing sixfold and attaining US $ 10 billion in 1979.

Whereas East-South trade as a whole increased at about the same pace as world trade, its share thus remaining roughly constant at 2 %, trade in manufactures between the two regions expanded more slowly than the corresponding world trade flow. As a result, East-South trade accounted for only 1.1 % of world trade in manufactures in 1979 as against 1.7 % in 1965.

The commodity composition in East-South and especially in Eastern European trade with the South is highly imbalanced. In 1979 still almost half of CMEA exports to the South consisted of manufactures, the respective shares being 30 % in the case of the Soviet Union and as much as 78 % for Eastern Europe. In 1965 those shares had even been 65 % (CMEA), 54 % (USSR) and 87 % (Eastern Europe). On the other hand, exports of manufactures from the South to the East accounted for only 8 % of the flow total in 1979, which is about the same share as that of 1965.[1] It

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1) Since the share of manufactures is reported to attain up to 40 % of total exports to the East of individual developing countries (e.g. Egypt, India and Pakistan) that are among the East's most important trading partners, manufactured exports by other developing countries must be negligible. (UNCTAD TD/B/808 (1980), p. 15). The commodity structure of trade flows is partly due to the trade policy of some developing countries, too.

had, however, attained a peak value of 19 % in 1972 and decreased again ever since. This fall cannot be attributed exclusively to the change in world price ratios between raw materials and finished products since 1973/74: although the share of manufactures in total exports of the South had equally diminished between 1970 and 1975 (from 18 % to 15 %), it rose again to 20 % by 1979 (tables 4 and C.17).[1)]

Trade between the two groups of countries is characterized by a persistent, and growing, export surplus of the East.[2)] Trade in manufactures used to yield an even higher surplus for the CMEA countries which is partly offset by a trade deficit in primary commodities and raw materials. The Eastern export surplus incorporates, at least in part, credits granted to the developing countries (see pp. 114 ff.).

The regional structure of Eastern trade with the South is characterized by a high degree of concentration: the five most important Third World trading partners account for more than 50 % of trade in each CMEA country, 70 % of trade was transacted with only 12 developing countries. The list of main trading partners in the 1970s comprises in Asia: Afghanistan, India, Iran, Iraq, Malaysia, Pakistan and Sri Lanka; in the Middle East: Syria, Turkey and Egypt; in Africa: Algeria, Nigeria and Tanzania; and in Latin America: Argentina and Brazil.[3)] On the other hand, the Soviet Union alone accounts for more than 60 % of total Eastern trade with the South.

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1) Palócz-Németh (1981), p. 45.
2) The export-import ratio of the East vis-à-vis the South increased from 1.25 to 1.47 in the second half of the 1960s. Though export-import ratios of the USSR and Eastern Europe vis-à-vis the OPEC and NOPEC countries were subject to considerable annual fluctuations in the 1970s, they all were at a marked low around 1975. Over the 1970s as a whole, it was Eastern Europe's export-import ratio vis-à-vis the OPEC countries that decreased most (from 4.29 to 1.10). Export-import ratios of both the Soviet Union and Eastern Europe in relation to the NOPEC countries increased as a whole (from 1.50 to 1.67 and from 1.08 to 1.44 respectively) (tables C.2 to C.4).
3) Tiraspolski (1980), pp. 3, 5, 9; UNCTAD TD/B/754 (1979), p. 11; Dobozi and Inotai (1981), p. 50; Machowski und Schulz (1981), p. 739; Sotrudnichestvo (1980), pp. 67.

Table 4

Share of manufactured goods in East-South trade 1965-1979 (%)

	1965	1970	1971	1972	1973	1974	1975	1976	197	1978	1979
CMEA											
In CMEA-exports	65	57	58	56	46	49	52	51	45	44	47
In Southern exports	9	16	17	19	15	12	12	11	11	9	8
Soviet Union											
In Soviet exports	53	44	45	42	33	32	34	33	28	30	30
In Southern exports	9	16	19	22	17	14	13	11	12	9	8
Eastern Europe											
In East European export	87	83	83	83	81	78	79	82	77	70	78
In Southern exports	10	15	15	16	13	11	12	10	9	10	9

Sources: UNCTAD Handbook of International Trade and Development Statistics 1979 and Supplement 1980,
UN Monthly Bulletin of Statistics, May 1981.

The importance of mutual trade for the two groups of countries is roughly indicated by the shares of trade with one region in total foreign trade of the other (tables 5 and 6). In a longer term retrospect (1955-1979), trade and trade in manufactures between East and South (starting from an extremely low level), grew faster than their total foreign trade flows. Looking at the more recent past, however, a different picture emerges. In the 1970s the importance of the South in CMEA countries' total foreign trade kept slowly growing but still remains at a very modest level (of 15 % in exports and 10 % in imports in 1979) by international standards, particularly so in the case of Eastern Europe (10 % in exports and 7 % in imports).[1] The South absorbed 13 % of CMEA's manufactured exports both 1970 and 1979, but only 10 % in some years in between. The importance of the South as supplier of manufactured goods to the East is not only strinkingly low, but even witnessed a decrease from 2.3 % in total manufactures imports by the East in 1970 to 1.4 % in 1979.

On the other hand, the share of the CMEA countries in the South's foreign trade clearly diminished in the 1970s, particularly in exports of manufactures from the South to the East, which represented just 1.3 % of Southern total manufactures exports in 1979 as against 4.4 % in 1970.

The modest performance of the various trade shares in the first half of the 1970s was not a consequence of decelerating rates of growth in East-South trade - quite to the contrary, mutual flows of total trade and trade in manufactures at current prices accelerated as against the preceding decade, but not as fast as trade with the other regions.

Summing up these developments it can be seen that a period of remarkable development of East-South trade relations since 1955 was followed in the 1970s by a generally weaker performance in several respects.

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1) Romania has the highest foreign trade involvement with the Third World of the Eastern European countries, the GDR the lowest (Table C.18).

Table 5

Growth rates and shares of East-South trade 1955-1979

Year	Average annual growth rates		Shares of mutual trade in total trade of East and South				
	Southern exports	Eastern exports		Share of the East in Southern exports		Share of the South in Eastern exports	imports
1955-60	18.0	15.3	1955	1.7	2.1	6.1	5.7
1960-65	14.6	12.6	1960	3.4	3.3	7.6	7.3
1965-70	7.7	11.3	1965	5.1	6.2	11.9	9.9
1970-75	27.2	20.4	1970	4.9	6.9	13.2	9.6
1975-79	9.7	18.0					
1971	-1.1	3.0	1971	4.3	6.3	12.5	8.7
1972	18.8	14.0	1972	4.4	6.3	12.0	8.3
1973	45.1	44.6	1973	4.1	6.5	13.1	9.0
1974	54.0	30.2	1974	3.1	5.1	13.8	11.3
1975	30.5	14.8	1975	4.3	5.1	13.2	11.0
1976	3.3	6.1	1976	3.7	4.9	12.9	10.8
1977	11.2	33.7	1977	3.6	5.6	14.8	10.9
1978	8.3	17.8	1978	3.8	5.6	15.2	10.3
1979	16.6	16.2	1979	3.2	5.4	14.8	10.4

Sources: UNCTAD Handbook of International Trade and Development Statistics 1980,
Trade relations among countries having different economic and social systems, UNCTAD TD/B/754,
UN Monthly Bulletin of Statistics, May 1981.

Table 6

Growth rates and shares of trade in manufactures between East and South, 1955-1979

Year	Average annual growth rates			Shares of mutual trade in manufactured goods in total trade in manufactured goods			
	Southern exports	Eastern exports		Share of the East in Southern exports	imports	Share of the South in Eastern exports	imports
1955-60	11.4	19.7	1955	2.7	1.7	5.8	0.3
1960-65	2.3	23.0	1960	4.2	3.2	8.1	0.2
1965-70	19.1	8.5	1965	4.0	6.3	12.9	1.6
1970-75	21.3	18.1	1970	4.4	6.0	12.9	2.3
1975-79	-0.2	14.8					
1971	9.1	4.5	1971	4.1	5.5	12.2	2.3
1972	33.7	8.7	1972	4.2	5.2	10.8	2.4
1973	11.3	20.7	1973	3.0	4.6	10.4	2.1
1974	25.7	36.8	1974	2.8	4.1	12.1	2.1
1975	28.7	22.7	1975	3.5	4.1	12.2	2.1
1976	-10.8	4.9	1976	2.4	3.9	12.0	1.3
1977	10.6	17.5	1977	2.2	3.9	12.3	1.8
1978	-6.0	14.8	1978	1.7	3.8	12.1	1.5
1979	6.8	22.9	1979	1.3	4.0	13.0	1.4

Sources: UNCTAD Handbook of International Trade and Development Statistics 1980,

Trade relations among countries having different economic and social systems, UNCTAD TD/B/754,

UN Monthly Bulletin of Statistics, May 1981.

Over the period 1965-1979 as a whole, East-South trade in manufactures in both directions rose to about the sixfold, which is equivalent to an average annual growth rate of 14 %. In 1979, exports to the South amounted to US $ 9.3 billion, exports to the East to US $ 1.1 billion. The annual growth rates of East-South trade in manufactures are subject to considerable fluctuations. This picture has to be qualified in two respects, namely in that they include price fluctuations (data on the volume of East-South trade are not available) and that in view of the low level of trade, absolute changes of a relatively small order result in substantial fluctuations of growth rates.

On the whole, growth rates of Southern exports to the CMEA region fluctuated more widely than those of Eastern exports to the South. This is in a certain contradiction, at least as far as manufactures are concerned, to the view maintained by the CMEA countries that economic relations with the East offer to the South the advantage of stable export markets. On the other hand, it may be argued that these fluctuations are at least in part due to the fact that some LDCs do not fully exploit the framework set up by trade agreements or use socialist markets as export outlets in times of sluggish demand by the West.[1)]

The second half of the 1970s witnessed a drastic deceleration of Southern exports of manufactures to the East as compared with the preceding decade. In 1976 and 1979 growth rates were even negative.[2)] As we shall see later, the reasons for this deceleration seem to be located on the demand side rather (pp. 110-111, table 3).

UN-data on the commodity composition of East-South trade in manufactures (table 7) are available in a one-digit breakdown for SITC groups 5 (chemicals) and 7 (machinery and transport equipment) whereas groups 6

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1) Nayyar (1977), p. 9.
2) See, however, the comments on the data basis on p. 85.

Table 7

Commodity composition of trade in manufactured goods between East and South, 1965-1979

CMEA

Year	Eastern exports SITC 5	6+8-68	7	total	Southern exports SITC 5	6+8-68	7	total
1965	8	31	61	100	11	87	1.1	100
1970	7	28	65	100	10	89	1.2	100
1975	12	28	59	100	15	81	4.6	100
1979	10	27	62	100	12	87	1.4	100

Soviet Union

Year	Soviet exports SITC 5	6+8-68	7	total	Southern exports SITC 5	6+8-68	7	total
1965	4	21	75	100	6	94	0	100
1970	4	20	76	100	8	91	0	100
1975	9	19	72	100	16	80	4	100
1979	5	14	80	100	14	86	1	100

Eastern Europe

Year	East European exports SITC 5	6+8-68	7	total	Southern exports SITC 5	6+8-68	7	total
1965	11	42	47	100	18	79	3	100
1970	10	37	53	100	12	86	3	100
1975	14	34	51	100	12	82	6	100
1979	14	36	50	100	10	88	2	100

Sources: UNCTAD Handbook of International Trade and Development Statistics, Supplement 1980, UN Monthly Bulletin of Statistics, May 1981.

(manufactured goods classified chiefly by material) and 8 (miscellaneous manufactured articles, including mainly consumer durables) are aggregated into one category.[1] In these broad terms, the commodity structure of East-South trade in manufactures, though subject to certain fluctuations, remained essentially unchanged over the years 1965-1979. The commodity composition within the two flows of manufactured exports differs considerably: whereas machinery and transport equipment has a share of around 60 % in Eastern exports, it accounts for just 1-5 % of Southern exports. Conversely, groups 6 and 8, incorporating goods of a lower degree of processing and technological level, taken together made up nearly 30 % of exports from the East but 80-90 % of manufactured exports from the South. Finally, 8-15 % of both flows consisted of chemicals, their share in the South-East direction generally being somewhat higher than in an East-South direction. This indicates that the commodity composition of exports of manufactures from the South to the East is "less developed" as compared with total manufacturing exports of the South, whereas the commodity structure of manufactures exports from the East to the South is more developed than that of total Eastern exports of manufactures. Another aspect of the "degree of development" of the commodity structure in East-South manufacturing trade is that the share of investment goods (SITC 7) is, by any international standards, very high in Eastern exports and extremely low in Southern exports.[2]

We shall now have a look at East-South trade in manufactures at a regionally more disaggregated level, meaning a breakdown in Soviet Union and Eastern Europe on the one hand and OPEC- and NOPEC-regions on the other hand. At this point, another comment on UN statistics on East-South trade seems appropriate. UNCTAD lists East-South trade data in the OPEC vs. NOPEC regional breakdown as "not available" for 1965, whereas they do appear in the UN Monthly Bulletin. However, the two sources' figures for 1965 Eastern trade with the South as a whole differ

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1) Beyond this, data are available for a few selected two-digit commodity groups.
2) Palócz-Németh (1981), p. 56. The South absorbed more than 15 % of Eastern SITC 7 exports in 1965 and 1970 and still about 13 % in the second half of the 1970s. .

by several percentage points, or millions of US $. Moreover, according to UNCTAD, Soviet exports to the South were higher than Eastern European exports; according to the Monthly Bulletin the reverse was the case. Data for Eastern imports differ by 3,0-13,0 % between the two sources. In view of the inconsistency of these data, any estimate of the split-up of the South into OPEC and NOPEC groups for 1965 (by combining the two sets of figures) would obviously be subject to an extremely high margin of error. 1965 being the base year, this would lead to biased growth rates, too, the more so since absolute values are relatively small, especially those of Eastern imports. We therefore limit ourselves to the 1970s in the analysis of East-South trade broken down into Soviet Union and Eastern Europe as well as into OPEC and NOPEC regions.

On the whole, Eastern Europe's foreign trade relations with OPEC and NOPEC groups developed more dynamically than those of the USSR[1)] and both Soviet and Eastern European manufactures exports to the OPEC group increased faster than those to the NOPEC region. Thus the fastest growing sub-flow was Eastern European exports to the OPEC region (+26 % p.a.) and the flow ranking last in terms of dynamics, Soviet exports to the NOPEC region (+ 13 % p.a.).

The second half of the 1970s (1975-1979), however, witnessed a slowdown in the rates of growth of Eastern manufactured exports to the South (from 18 % p.a. to 15 % p.a.) and a remarkable change in the growth patterns as described above for the whole of the 1970s. The deceleration was exclusively due to Eastern European exports and, within these, to exports to the OPEC countries that grew by just 9 % p.a. as against 42 % p.a. in the preceding five years. At the same time, Soviet exports to the South accelerated (16 % p.a. vs. 12 % p.a.), with exports to the NOPEC region expanding at 18 % p.a. (1970-1975: 10 % p.a.). As a result, growth pattern of East-South trade in manufactures in the second half of the 1970s became exactly the reverse of that in the first half of the

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1) This holds for the periods 1965-1979, 1970-1979 and 1970-1975, the only exception being 1975-1979 when Eastern European exports to the South increased somewhat slower than Soviet exports.

decade: the fastest growing flow was Soviet exports to the NOPEC group of countries, the least dynamic flow Eastern European exports to the OPEC countries.

As for Southern exports of manufactures to the East, it was already pointed out earlier that OPEC plays a negligible role as supplier to the East. An analysis of growth rates is rather useless, as extremely small changes in value terms result in misleadingly high growth rates. On top of that, exports from the OPEC region to the East are characterized by a very unstable development. The OPEC's exports to the Soviet Union amounted to US $ 9 to 38 million p.a. in the 1970s, representing 3-5 % of Soviet imports from the South. The OPEC region's exports to Eastern Europe show a "peak" value of modest US $ 17 mln. in 1975 and decreased to US $ 6 to 8 mln. thereafter. Their share in total manufacturing imports from the South decreased from 3 % to only 1 % in the 1970s.

Hence the bulk of Eastern imports of manufactures from the South stems from the NOPEC group of countries. In the 1970s, this flow grew at an average annual rate of 14 % in relation to Eastern Europe and at 9 % to the USSR. Here again, some qualifications are called for. The second half of the 1970s was a poor period for Southern exports of manufactures to the East. Not only that they practically stagnated between 1975 and 1979, they were absolutely lower than in 1975 in each year in relation to the Soviet Union and in two years (1976 and 1977) in relation to Eastern Europe. At the same time Eastern Europe absorbed a growing portion of NOPEC's exports of manufactures to the CMEA (1970: 35 %, 1979: 47 %).

The commodity structures within manufactured goods trade with the South, of the Soviet Union on one side and of Eastern Europe on the other, are not identical either (table 7). What they do have in common is a considerable rigidity in the course of time. This is, in qualitative terms, in contrast to the rapid structural change in Eastern manufacturing industries. Generally speaking, the commodity composition in

Soviet trade is even more unbalanced than that of Eastern European, in the sense that SITC 7 is higher in Soviet exports (including arms delivieres that are paid for), and lower in Soviet imports. In addition, the concentration on investment goods even rose by 5 percentage points to 80 % of Soviet manufactures exports between 1965 and 1979, mainly at the cost of SITC groups 6+8-68. Within Southern exports to the USSR, machinery and equipment was practically non-existent in 1965 and attained a maximum share of 4 % thereafter (corresponding to a maximum value of US $ 29 million in 1975). At the same time, the share of chemicals rose from 6 % to 14 % at the cost of SITC groups 6+8-68, which fell from 94 % to 86 %.

In Eastern European manufactures exports to the South, the degree of concentration is a little lower. Investment goods account for about 50 %, SITC groups 6+8-68 for 35-40 % and chemicals for 10-15 % of the total. In the 1970s as a whole the share of investment goods was higher than in 1965, that of SITC groups 6+8-68 correspondingly lower. In Southern exports of manufactures to Eastern Europe no clear development pattern can be identified. On the average machinery and transport equipment had a higher weight (but still only 6 % as a maximum share, corresponding to US $ 23 mln in 1975), and chemicals a lower, than in the case of the Soviet Union.

The empirical evidence suggests that East-South trade, though having expanded rapidly in the past 15-25 years, may be regarded as "underdeveloped" in two respects. First of all, it is generally considered to remain far below the level attainable in view of the two regions' economic background, both in terms of volume and in terms of shares in total foreign trade of the two groups of countries. Secondly, the East's imports of manufactures from the South are much smaller than what would correspond to the absorption by the East of total world manufacturing exports. On the whole, manufactures played a more important role (in terms of shares) in Southern exports to the other regions than in exports to the East.[1)]

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1) Cf. diagram 2, table C.17 and Ohlin (1981), pp. 273 ff.

We shall now examine what factors played a role in those developments, confining ourselves to the economic factors. An investigation into the no less important political, strategic and historical determinants of East-South trade would go beyond the framework of this study. Still, it should be mentioned that the absence of colonial ties between the two groups of countries is one explanatory factor for the extremely low initial level of mutual trade in the 1950s. This fact, in combination with the subsequent process of decolonialization and the politically motivated support by the East for the young national States essentially contributed to the growth of East-South trade. As for manufactures, the lack of trading traditions between the CMEA countries and the developing countries as compared to other trade flows, is of considerable importance. In assessing the better performance of Southern manufactures exports to the West than to the East, the specific impact of TNC's intra-firm trade must also be borne in mind.

East-South trade is a zone of encounter for the two systems fo economic management, roughly categorized as centrally planned economies (CPEs) and market economies respectively, as is East-West trade. Keeping in mind that this systemic dichotomy is highly simplified, it still holds that there is much in common between East-South and East-West economic relations as far as the modes of transaction and some limiting factors originating in the systems of central planning are concerned. It seems therefore appropriate to point out the principal characteristics of the function foreign trade is accorded in CPEs before we turn to East-South trade proper.

In their early years of existence the European socialist countries had, in the climate of Cold War, embarked upon an autarkic policy facilitated by the then plentiful availability of domestic production factors. Foreign trade in general and trade with other regions in particular was attributed a marginal role only, exports being regarded exclusively as a means to finance absolutely indispensable imports, be it in foreign exchange or in kind.

In the course of détente and the gradual exhaustion of extensive growth factors a reorientation towards a more open economic policy took place around 1970.[1] At the same time, the concept to use exports merely as a source of revenue to cover planned import requirements was basically retained. The expansion of exports, however, could not keep pace with that of imports for several reasons. First of all, the system of central planning has teudency to result in a supply-constrained type of economy and, consequently, to lead to bottlenecks in exportables. Apart from that, the CMEA countries had, in the earlier period of autarkic policy, failed to build up sufficient export capacities. Another set of systemic obstacles to trade lies in the isolation of the CMEA countries' price systems not only from world market prices, but also from each others' prices, and the resulting inconvertibility of their currencies. These features, in turn, create a strong general tendency to bilateralism in foreign trade relations and bilateral clearing, i.e. balancing of exports with imports, thereby allowing the volume of trade to be limited by the less potent or less interested partner. In relation to the West and increasingly to the developing market economies, too (i.e. to the extent that convertible currencies are used in trade with them), the concurrent chronic hard currency shortage and indebtedness to the West of the CPEs have become growing problems and obstacles to trade.

In many cases CMEA-produced goods offered for exports are also not easily saleable on world markets and particularly on Western m because their quality, technical level, styling and design or -ersale service do not come up to international standards. Deficiencies of this sort are due to the relative lack of competitive pressure on producers in most of the CPEs in their present form.

Although intra-CMEA trade is also beset to some extent by all the hampering factors just mentioned, there is still a certain bias in favour of it from the point of view of the socialist countries. Quite apart

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1) As was shown earlier, it was the West rather than the South that derived the benefit of this opening of the CMEA economies in terms of market shares (table 3).

from considerations of politics and of economic geography, trade with CMEA partners is much more amenable to being planned and more convenient to handle for the economic agents involved, since the system of economic management of the partner country is familiar to them and no marketing efforts comparable to the case of extra-regional exports are required. The preference for intra-CMEA trade is also due to its relative price stability and to the fact that little of it is subject to payment in hard currencies.

Having outlined the more important systemic factors influencing (limiting) trade between CPEs and market economies in general, we now turn to the specific conditions and determinants of East-South trade.[1)]

As we have seen earlier, East-South trade flows, though at current US $ prices, grew at substantial rates until about the mid-1970s. Among the main factors contributing to this rapid expansion are likely to be found the benefits both parties derived from bilateral clearing under conditions of hard currency shortage and a certain complementarity of import demand and export supply.[2)] In addition, taking up or expanding trade with the East opened up alternative supply sources and export outlets for the developing countries concerned, thereby strenghtening their bargaining position vis-à-vis the West. However, the question remains why East-South trade is still very modest by international standards. We disregard for the moment the systemic obstacles to extra-regional trade at work in the CPEs. The CMEA region, contrary to the West, is by and large self-sufficient in raw materials which set tighter limits to the South's appropriate exports in absolute terms. On the other hand, even in primary commodities that the South is obviously specialised in (food, agricultural raw materials and ores and metals, the only exception being fuels), its market share in the East, though growing, was smaller than that of the West.[3)]

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1) For a discussion of the interests of both groups of countries underlying East-South trade and the benefits derived therefrom see e.g. Nayyar (1977) and Machowski und Schultz (1981), p. 741.
2) Nayyar (1981), pp. 81 ff.
3) Paszyński (1981), p. 37.

Moreover, the CMEA countries themselves possess relatively large capacities for the production of traditional manufactured goods that are increasingly produced and offered for export by the Third World as well. In this sense, the structure of production is less complementary and the potential for trade more limited between East and South than between West and South.[1)]

As a consequence of growing hard currency problems and indebtedness to the West the CMEA countries embarked upon a more restrictive import policy in the mid-1970s. In this context, the transition in East-South trade to payments in hard currencies may have turned into a limiting factor for the developing countries' manufactured exports. Since the East apparently prefers Western manufactures to those of the South, imports of manufactures from the South are prone to be hit hard by the restricitive import policies of the East. Another aspect of the East's and the non oil exporting South's persistent hard currency shortage is that, if there is demand for their exportable products in both other regions, exports to the West are given priority.[2)]

As one Hungarian economist puts it, foreign trade relations (of the East) with the developing countries did not become on organic constituent part of the CMEA countries' economic strategy. They "were regarded by the CMEA countries as a special case and as a certain sacrifice".[3)]

The interplay of all these factors tended to reduce the role of East-South trade in manufactures to a mere residual. In particular, there is much reason to assume that the correlation between Eastern trade in manufactures with the South and structural changes in manufacturing industries within the East is negligible. Growing competition in third markets constitutes a link of a less direct kind between trade performance of the developing countries and changes in the CMEA countries' industrial structure. On the other hand, the relatively low volume and the traditional

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1) In assessing the relative success of Southern exports of manufactures to the West, the role of TNCs must not be overlooked (see also p. 108).
2) See e.g. Fallenbuchl (1978), p. 14
3) Palócz-Nemeth (1981), p. 50

pattern of East-South trade suggest that it did not bring about significant change in the structure of manufacturing production in the developing countries either[1] - with the exception of very few individual developing countries that the CMEA countries concentrate on in carrying out industrial cooperation projects (see section 4). Moreover, it is generally understood that the commodity composition of Southern trade with the East did not even keep pace with structural changes within the developing countries.

4. East-South industrial cooperation

Besides foreign trade proper, various forms of economic and scientific-technical cooperation have developed into an element of growing importance in East-South economic relations. The concept of economic cooperation is usually understood in a rather broad sense, both in terms of forms and in terms of fields of cooperation. The aspect of most interst, obviously, in the context of this study, is industrial cooperation in production, particularly in manufacturing production. Industrial cooperation is most frequently undertaken in the form of the CMEA countries' supplying capital equipment and related services for the construction of industrial enterprises in developing countries on a compensation basis. Other forms of industrial East-South cooperation, though on a far lesser scale, are co-production, subcontracting, joint ventures, cooperation in third countries and tripartite cooperation.[2] The latter forms relate more often to manufacturing branches than the first does. They all may be applied in various combinations and are to a considerable extent based on the experiences gained in East-West cooperation.

We shall here deal neither with the manifold insitutional organizational, legal and financial aspects of East-South industrial cooperation

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1) Nayyar (1977), pp. 11 and 12.
2) We leave aside cooperation in planning (because, consisting at present mainly in an exchange of information and planning expertise, it has hardly any bearing on industrial production) and the training of personnel, the education of academic students, the sending of economic advisers and technicans, R & D, prospecting and other pre- and after-production cooperation activities.

nor with problems of definition. These topics are covered elsewhere in considerable detail and would go beyond the scope of this study.[1)]

Generally speaking, cooperation as well as trade is carried out on the basis of bilateral intergovernmental agreements. Among the most active partner countries in industrial cooperation are reported to be Afghanistan, Algeria, Brazil, Egypt, Iran, Iraq, Mexico, Nigeria and Syria,[2)] most of which belong to the CMEA countries' principal trading partners.

Concerning the fields of industrial cooperation activities with the South, a certain pattern of specialization has emerged among the CMEA countries: Bulgaria specializes in mining, agriculture, electrical equipment and woodworking; Czechoslovakia in transport equipment, agricultural machinery, chemicals and rubber products, industrial construction and light industry; the GDR in machinery, metalworking, instruments, telecommunications and chemicals, Hungary in electrical machinery, transport and mining equipment, and chemicals; Poland in machinery, transport equipment and chemicals and Romania in the development of mineral resources, petrochemicals and agricultural machinery. The USSR concentrates on cooperation in mining, ferrous and non-ferrous metallurgy, heavy machinery including power equipment, the building industry and agriculture.[3)]

The most common form of industrial East-South cooperation is the supply of capital equipment and related services for the establishment of industrial enterprises in a developing country by a CMEA country.[4)] Therein, several variants are feasible: the project may be implemented by one CMEA country alone (which has been the rule until now) or by several CMEA countries, on a turnkey basis or otherwise, and with or without the participation of enterprises and labour of the developing country itself.

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1) See e.g. UNIDO ID/WG. 299/1 (1979) and Sotrudnichestvo (1980).
2) UNCTAD TD/B/806 (1980), pp. 6 and 15.
3) ibid, p. 15.
4) These enterprises remain in national ownership of some form with the rare exception of joint ventures.

Such projects are mostly transacted through credit and/or compensation (buy-back) arrangements: the developing country pays for the Eastern supplies by deliveries of traditional export goods or of the goods produced by the plant in question. Arrangements of this sort are essentially bilateral credits in kind, accorded by the East to the South.

Hereafter we shall refer to them as compensation arrangements. The bulk of the CMEA countries' credits to the developing countries consists of precisely this kind of commodity credits tied to imports from the CMEA donor country.[1] The standard credit of this kind is a state credit with a repayment period of 8-15 years at an interest rate of 2-3 %, with or without a grace period of up to 3 years.[2] As the debt service takes the form of commodity exports to the Eastern countries, the problem of pricing arises.[3] According to the UNCTAD secretariat, prices are not inevitably fixed, but subject to periodic adjustment in accordance with fluctuations in the world markets.[4]

Because of the lack of quantitative information, it is impossible to quantify the impact of such compensation arrangements on economic and industrial structures of the developing countries, on the CMEA economies and on East-South trade. If such an estimate were possible, it could also be regarded as an acceptable approximation to the impact of East-South industrial cooperation in general, since its other forms are as

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1) A Russian source says that Eastern credits to the developing countries amounted to more than 16 bln roubles at the beginning of 1979 (Sotrudnichestvo (1980), p. 42). This figure must have been arrived at by cumulating data over a longer period. According to Western estimates, Eastern credit commitments to the South amounted to US $ 2.5 bln in 1979. They are estimated to have been utilized by 35-45 % (Machowski und Schultz (1981), pp. 741 f.).
2) Sotrudnichestvo (1980), p. 42; UNCTAD TD/B/806 (1980), p. 16; Machowski und Schultz (1981), p. 742. Sometimes the pertaining agreements provide for continued Southern deliveries even after repayment of the credit.
3) This problem is very similar to that encountered in the transaction of so-called intra-CMEA investment contributions.
4) UNCTAD TD/B/806 (1980), p. 20. The study quotes the recently concluded phosphate deal between Morocco and the USSR, where prices are subject to annual renegotiation in that sense (ibid., p. 21).

yet of marginal quantitative importance. Nevertheless, some insights can be derived from the scattered and fragmentary information available.

For illustrative purposes, we present the following data from Soviet sources (the only ones of this kind we found): Eastern credits in the form of investment goods deliveries are reported to have accounted for 24.6 % of total investments in Afghanistan in the years 1967-1972 and for 7 % in Iraq in 1965-1969. The respective shares in industrial investments are said to have been 75.7 % in the case of Afghanistan and about 27 % in the case of Iraq. It was 40 % in Egypt in 1965-1970. Soviet' assistance alone was responsible for more than 30 % of total investments of the Democratic Peoples Republic of Yemen in 1971-1974 and for more than 15 % of Syria.[1)]

According to latest publications, the number of 'industrial and other objects set-up in the developing countries with the assistance of the CMEA-countries' is 4658, 3157 of these being completed and in operation, the others still under construction.[2)] In the pertaining literature, global figures of this kind are usually illustrated by a variety of individual examples, but a comprehensive country- and branch-breakdown is neither given directly nor can it readily be compiled from the scattered cases described. According to a comparatively informative Russian source, 1035 such 'objects' out of a CMEA total of 3560 (presumably in 1978) were Soviet cooperation projects. Roughly 2670 of the total were reported to be operative, 583 thereof established in cooperation with the USSR, more than 540 'objects and individual plants' with the GDR, about 260 with the CSSR, more than 200 'complete industrial objects' with Poland and about 50 with Bulgaria. Assuming that these country figures are consistent with the global figure in definition (which appears doubtful in view of the GDR statement), this leaves still about 1000 objects, with Hungary and Romania unspecified.[3)]

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1) Sotrudnichestvo (1980), p.42.
2) DDR Aussenwirtschaft 29/1981, p.3. The phrase in quotation marks is generally used in Eastern and, too, in UNCTAD publications without an exact definition of what precisely is understood by 'assistance'.
3) Sotrudnichestvo (1980), p. 32.

The countrywise distribution of cooperation projects in developing countries is characterized by an even higher degree of concentration than is trade: about three quarters of the projects established with the assistance of the CMEA countries are located in only five developing countries (table 8).[1] The geographical pattern seems to be similar to that of trade in the sense that the most important trading partners are also preferred cooperation partners of the East.

A first indication of the sectoral breakdown of East-South economic cooperation is a share of about three quarters in (tied) credits accorded by the CMEA countries to the developing countries earmarked for industry, which, however, is meant to include extractive industries and energy generation.[2] The latter two branches are also among the preferred fields of cooperation arrangements.

At the end of 1976, out of a total of then 2300 plants put into operation with the assistance of the CMEA countries, more than 650 related to energy production and transmission, 190 to construction materials industry, 180 to mechanical engineering and metalworking, 150 to chemical and petrochemical industries, 50 to ferrous and non-ferrous-metallurgy and 625 to light and food industries and agriculture.[3] These figures leave unspecified some 500 enterprises, i.e. nearly a fifth of the sum total. They are, moreover, not quite in line with some qualitative statements made elsewhere which list mining and metallurgy as being among the main areas of East-South cooperation.[4]

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1) 40 % of the relevant Soviet-built enterprises are said to be located in Afghanistan, Iran, Algeria and India, and 40 % of Czechoslovakia-built projects in India, Syria, Iraq and Brazil, all in that order (Sotrudnichestvo (1980), p. 32).
2) UNCTAD TD/B/808 (1980), p. 17. The remaining quarter was granted for agricultural and infrastructural purposes.
3) These data are specified in contradictory ways. They were first published in UNCTAD/TD/B/656, p. 17 for 1976, and meant to cover completed plants. A more recent study (UNCTAD TD/B/806 (1980), pp. 14 f reports some of them unchanged (presumably for 1979) has referring to 'enterprises that have been, or are being, completed'.
4) UNCTAD TD/B/808 (1980), p. 17 and TD/B/754 (1979), p. 15.

Table 8

Number of projects established with the assistance of the CMEA countries in developing countries

Egypt	831
Iraq	649
India	388
Iran	274
Syria	204
Algeria	292
Afghanistan	136
Ghana	79
Libya	98
Bangladesh	94
Turkey	52
Pakistan	55
Somalia	41
Mali	29
PR Congo	23
Nigeria	28
	3.273

Source: Palócz-Németh (1981), p. 73 with reference to UNCTAD ID/WG. 299/3

Industrial cooperation projects in manufacturing industries are still in the minority. A considerable part of them serves the production of semi-manufactures of a relatively low degree of processing and some of them presumably to assembling activities (particularly in transport equipment industry). The 625 'plants' set up in light and food industries and in agriculture taken together are likely to include quite a substantial number of agricultural projects.

The focus of this form of industrial cooperation on extractive industries, the energy sector and primary commodities reflects Eastern interests insofar as it serves - in the form of buy-back or equivalent arrangements the satisfaction of these countries' import demands. The Eastern countries are probably also more competitive in machinery and equipment for these fields of production than for others on the Southern markets. On the other hand the developing countries themselves have obviously been interested, in the initial phase in establishing a domestic infrastructure and raw material and primary processing base in national ownership. Another factor that may have contributed to this choice of cooperation areas is the preference of the CMEA countries for cooperating with the state sector of the Third World countries, which is most likely to be found in basic industries.

In somewhat more detail, instances of industrial cooperation through Eastern equipment deliveries are reported in the following manufacturing branches: oil refining, nitrogenous fertilizers, sulphuric acid, tyres, pharmaceuticals; cement, bricks; chemical, heavy electrical and mining equipment, high-pressure vessels, work tools, armatures, pumps measuring instruments, vehicles, tractors, diesel and electric motors; textiles; leather and shoes; furniture, TV-sets; bottles, window glass, ceramics; beer and tobacco.[1)]

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1) UNCTAD TD/B/754 (1979), p. 15, UNCTAD TD/B/808 (1980), p. 18, Sotrudnichestvo (1980), pp. 35-40, 77, 78, Tirasnolski (1980), pp. 12-13.

Another indicator brought forward in Eastern and UNCTAD publications is the annual quantity of some of the goods produced on the plants in question. It is said to be more than 30 mln. tons each of oil products and steel.[1)]

The lack of similar data for the other manufacturing industries might be due not only to the heterogeneity of products and hence to measurement problems, but presumably also to their insignificance.

In view of the highly uneven distribution of industrial East-South cooperation as among developing countries, the degree of aggregation of such figures is in any case too high to be really meaningful. A more useful approach to assess the importance of cooperation with the East for the Southern countries' industries would therefore be country or case studies respectively.

The supply of investment goods inherent in this cooperation form has, per se, a direct trade-creating impact. It is likely to entail, after the completion of the plant, further Eastern exports of spare parts and possibly of certain materials or components (in the case of assembly). In the that the project is transacted on a compensation or buy-back basis, it will also bring about directly cooperation-related exports from the developing country to the East. When the project is of the buy-back type, the increase in Eastern Exports of investment goods precedes the increase of the developing country's exports - until now mainly of raw materials, primary products and semi-manufactures - resulting, in principle, in a temporary trade surplus on the part of the CMEA cooperation partner(s). In practice, the direct impacts of subsequent cooperation deals may, and will, of course overlap.

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1) For crude oil, annual production figures are reported to be 60 mln. tons, for coal, 20 mln. tons, for electric power capacities, more than 16 mln. kW. Precisely these figures are published since 1979. UNCTAD TD/B/754 (1979), p. 15 and Ikonomicheski zhivot 29/1981, p. 9.

There is not sufficient information that would allow to single out this sort of cooperation-related trade from the flows total. The only data to this point published by UNCTAD, is that 25 % of the developing countries' exports to the USSR are provided by the capacities built in the developing countries with Soviet technical assistance. A 'considerable share' of these exports is said to fall within manufactured products.[1] This statement has to be seen in the light of the definition of 'developing countries' used in UNCTAD documents in that it includes Yugoslavia as well as Cuba, which implies an upward 'bias' of the 25 % figure as compared with the non-socialist developing world.

For the sake of completeness we note the indirect trade-creating effects that may be produced by the construction of industrial plants by the East and South. They may for example, facilitate the implementation of further cooperation projects of a similar kind and make possible additional exports by the developing country to third countries.[2] On the other hand, they are obviously an element of import substitution for the developing country.

We shall now briefly touch upon the other forms of East-South industrial cooperation, which are as yet of minor quantitative importance.[3]

Subcontracting and co-production are cooperation forms that are still very rare indeed. The existing cases, exclusively with some of the more

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1) UNCTAD TD/B/754 (1979), p. 17. Supposing that Southern exports of manufactures to the USSR are exclusively produced on plants established in cooperation with the USSR, which is certainly an overestimate, the share of manufactures in Southern exports to the Soviet Union provided by such capacities would have been roughly 40 % in the second half of the 1970s.
2) The latter seems to be the case in some instances mentioned under the heading 'cooperation on third markets'. Lukina (1981), p. 2.
3) The share of deliveries resulting from industrial cooperation other than compensation arrangements is estimated to be no more than 2-4 % of East-West trade. It must be even lower in East-South trade (UNCTAD TD/B/806 (1980), pp. 21-22).

advanced developing countries, are of interest insofar as they relate mostly to manufacturing industries (pharmaceuticals, vehicles, buses, tractors, TV-sets). The role of the developing countries, at least in the initial stage of cooperation, is the assembly of components produced in the Eastern countries. Later on, the developing country may take up (and actually did so in some cases), the local manufacturing of certain components initially imported from the CMEA partner country This sort of arrangement is often linked with the supply of capital equipment and know-how by the Eastern partner on a compensation basis.[1)]

Another variant of subcontracting consists in enterprises of the developing country manufacturing certain components for the equipment of industrial projects where the Eastern country acts as the main contractor.[2)]

The 1970s witnessed an increase in the practice of a relatively new form of East-South industrial cooperation, namely of joint ventures. We shall briefly present the results of a study to this point elaborated by C. McMillan.[3)]

At the end of 1978, the European CMEA countries were holding equity in 185 companies located in the developing countries (as against 359 cases in the OECD countries). The major Eastern investors in the Third World were Romania, Poland and Hungary, the main target countries on the African continent (75 companies). The Eastern capital participation in the South is mostly in the form of an equal or minority holding - as opposed to a preponderance of majority shares or full Eastern ownerhsip in Eastern foreign investment in the OECD countries. As far as principal activities of the East-South joint ventures are concerned, the emphasis is on the extraction and processing of raw materials (51 companies) and

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1) UNCTAD TD/B/754 (1979), p. 17 and TD/B/808, pp. 14 f.
2) UNCTAD TD/B/808 (1980), pp. 10-11.
3) McMillan (1979), pp. 363-386.

on manufacturing and assembly (45 companies). This is a very clear reflection of the obvious interest of the Eastern countries in obtaining access to the developing countries' raw materials and cheap labour.

The value of fixed assets of all the 195 joint companies at the end of 1978 was $ 3900 mln., 92 % of which in ventures aimed at resource development; the value of the capital directly invested by the CMEA countries being $ 270 mln.[1)]

Up till now, cooperation of a CMEA country and a developing country in third countries appears to be more a declaration of intent (in the form of provisions relating thereto) than a significant reality. According to UNCTAD, 'not very many projects' have actually been implemented.[2)] In these cases, it is the more advanced developing countries with considerable experience in cooperation with the East that are involved (e.g. India, Brazil). The participating enterprises of the developing countries had sometimes been set up by the CMEA country in question.[3)]

Cooperation activities in third countries related apparently to the manufacturing branches such as heavy machinery and transport equipment. In the case of India, the Eastern countries consider machine-tools, heavy machinery, tractors, railway carriages and electronic products as promising fields of cooperation in third countries.[4)]

Tripartite industrial cooperation (TIC) is generally understood to mean the cooperation at the enterprise/organizational level between deve-

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1) The value of fixed assets in CMEA companies in the OECD countries was only $ 473 mln. because the activities involved are much less capital intensive there (mostly marketing and other services, including banking). On the other hand, the value of direct CMEA investment in the OECD region exceeds that in the Third World ($ 454 mln.), due to the higher equity shares and number of companies.
2) UNCTAD TD/B/754 (1979), p.16. Some of the instances quoted under this heading seem to represent the export-creating impact of the establishment of industrial enterprises by Eastern in developing countries rather than true cooperation in third countries.
3) UNCTAD TD/B/806 (1980), p.24, Lukina (1981), p.2.
4) Lukina (1981), p. 1.

loping, socialist and developed market economy countries or, in a narrower concept, the joint construction by Eastern and Western participants of industrial complexes in the South.[1] A recent study shows that out of a sample of 226 TIC operations in 1965-1979 40 % related to the energy sector, about 50 % to manufacturing branches in the broad sense of the term, the rest falling to mining, building and public works, transportation, commerce, services, telecommunications and agriculture. Within the manufacturing branches, the distribution of activities was as follows: 30 % (of the 226 total) was aimed at intermediate goods industries (40 % thereof basic chemicals, 16 % building materials and glass, and 13 % paper and cardboard), 15 % at consumer goods industries (54 % thereof agricultural and food industries and 36 % textiles and clothing) and only 5,3 % at equipment goods industries (66 % land transport equipment, 17 % mechanical equipment and 17 % electric and electronic equipment).[2] On the Eastern side, the most active countries in TIC are Hungary and Poland, on the Southern side some of the OPEC countries (Iraq, Iran, Algeria, Libya, Kuwait).[3]

There are substantial indications that the participation of the developing countries involved in TIC projects is as a rule small or negligible, nearly always limited to civil engineering or construction works so that it would be more accurate to speak of East-West cooperation in third (developing) countries rather than of TIC.[4]

The study we are referring to suggests that there tends to be a significant correlation between the types of TIC projects and the general structure of imports of capital goods in developing countries. This would mean that TIC has no specific character in determining the type of development brought about.[5]

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1) Levcik and Stankovsky (1979), p. 125, McMillan (1980), p. 337.
2) Gutman (1981), pp. 346-348
3) ibid, p. 338
4) This part of the study is based on an analysis of 40 TIC cases between France, Eastern and developing countries, which, of course, sets certain limits to the scope of the results. See also McMillan (1980), pp. 79, 24.
5) Gutman (1981), p. 349.

5. Perspectives in East-South economic relations

Experts are in broad agreement on the existence, in principle, of an appreciable growth potential for economic relations between East and South. However, the views diverge considerably in the discussion about the ways and means of mobilising this potential and about the extent of its being realised. The authors of the study will put the emphasis in this chapter on Eastern policy makers' and economists' viewpoints on these questions.[1)]

In view of the present problems in the world economy, major structural adjustments are increasingly called for. At an international level they would have to bring about considerable changes in specialization patterns of production and trade. In the case of East-South economic relations the adjustment process would imply - roughly speaking - the transition from inter-sectoral to inter-branch and finally to intra-branch specialization patterns. We shall first point out the main interests regarding the contents of such a change. To start with, it is very likely that the increasing economic problems of the CMEA countries, particularly the bottlenecks of the Eastern European countries in the energy and raw materials sector, will lead to more weight being accorded than was the case in the past to economic considerations (interests and possibilities) as opposed to purely political considerations in the framing of their trade policies vis-à-vis the developing countries.[2)] On the other hand, Soviet policy is not constrained by raw materials and fuel problems comparable to those of the Eastern European countries.[3)] There are, however, certain conflicts of economic interests between the two groups of countries, at least in the medium term. Reduced to their essentials,

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1) The various attitudes of the developing countries are well known to UNIDO.
2) See Kanet (1981), p. 326.
3) See Kupper (1981), pp. 775/76. The Soviet Union is practically independent of fuel and most raw material imports from the developing countries.

they consist in the following. The East European countries do, and will, face very serious problems in covering their requirements of fuels, above all oil, and certain other raw materials.[1] The Soviet Union itself - their main supplier of these commodities - is confronted with production lagging behind expectations and with rising costs of production. Besides, the current intra-CMEA price mechanism makes exports of fuels to the East European countries less profitable than exports to the world markets. The interplay of these factors results in the Soviets trying strictly to limit such deliveries to the CMEA partner countries.[2] Although the emphasis in all East European energy and raw materials policies is put on conservation measures, it can be expected that it will take some time before they lead to sizeable results; and that more expensive and hard-currency-consuming imports from developing countries will have to be maintained. Various experts express different views on the long-run perspectives of Eastern Europe's imports of raw materials and fuels, and of oil in particular, in terms of volume and of prices. In any case, the satisfaction of their energy and raw material demand will remain of vital importance and will have to be accorded first consideration in the East European countries' trade policies. This, in combination with the limited resources available for non-CMEA imports, and a likely priority for manufactures imports from the West, would appear to leave Eastern Europe with a minimal capacity for absorbing the developing countries' manufactures exports. On the other hand, the developing countries will hardly be prepared to retain their role as producers and suppliers of raw materials, fuels and primary commodities in exchange for investment goods that are not at the highest technological and qualitative level. Even now they demand better access to Eastern manufactures markets. Other conflicts of interests may arise in connection with the distribution of gains from trade and cooperation and with increasing competition in Western markets for manufactured goods.[3]

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1) Cf. e.g. Dietz and Grosser (1981).
2) For 1982, the USSR has announced a cut by 10 % of oil exports to the East European countries.
3) Nayyar (1977), p.83

Since no steps for mutual structural adjustments of the CMEA and the developing countries have been initiated so far, the possibilities for a significant change in the trade patterns are rather limited in the medium term. It is reported that the CMEA countries' new five-year plans (for 1981-1985) envisage trade with the South (as well as trade with the West) to grow more rapidly than intra-CMEA trade.[1] It is conceivable that Eastern imports of consumer goods might increase relatively fast, given the tensions on Eastern consumer goods markets. Specific mention is made of household and electrical appliances, cosmetics, toiletries, leather manufactures, clothing and ready-made garments, shoes, handicrafts, perfumes, metalware, food products and textile semi-manufactures.[2] As oil imports at current prices will grow fairly rapidly too, even this would not be likely to change the commodity composition to a perceptible extent. On top of that it is argued that the Eastern five year plans for 1981-1985 are already fixed so that the scope for significant change is small.[3] This statement probably implies that the plans do not incorporate basically changed approaches regarding trade with the South.

In a long-run perspective, however, the problem of adjustment persists. Eastern approaches to that point are principally based on various kinds of cooperation agreements and enforced coordination procedures as the most promising instruments for bringing about a restructuring of trade and production in the East-South relationship.[4] They plead for example, for a 'programmed process based upon negotiated commitments on both

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1) UNCTAD TD/B/808 (1980), p. 29. This very likely reflects the expectation of rising oil and raw material imports from the South at rising prices. Other sources expect that East-South trade will grow more rapidly than East-West trade, due to marketing difficulties in Western markets (Sotrudnichestvo (1980), p. 184).
2) UNCTAD/TD/B/808 (1980), p. 15. As for household and electrical appliances, it will be very likely exports produced by TNC affiliates established in the developing countries.
3) Pazyński (1981), pp. 40 f.
4) Sotrudnichestvo (1980), various chapters and Paszyński (1981).

sides', and, more precisely, in the form of 'long-term bilateral agreements' of a 'sufficiently elastic' nature.[1] The main doubts arising against this concept lie in the facts that, first, the majority of the developing countries are essentially of the market (or mixed) economy type which does not lend itself easily to such an adjustment mechanism and that, second, the experiences of CMEA integration itself, which is based on a comparable (largely bilateral) mechanism, show the problems and weaknesses of its functioning even among the centrally planned economies themselves.[2] On the other hand, it would be 'unreasonable to assume that the centrally planned economies would allow for market-based adjustment'.[3]

The discussion of mutual structural adjustment of the CMEA and developing countries and the obstacles thereto focusses mainly on difficulties originating in the first group of states.[4] It is a well-known fact that the centrally planned economies respond to external changes with a considerable time lag for systemic reasons. They are characterized by a relatively high specific consumption of raw materials and fuels, which, in combination with hard currency constraints, tends to be reflected in the commodity composition of trade. Moreover, with the continuing relative shortage of production capacities, the decisionmakers are reluctant to give up the already installed productive capacities in order to make room for international specialization;[5] a slowdown in economic growth would make structural changes more difficult.

It is maintained that the success of adjustment processes will depend very much on whether the CPEs and above all the Eastern European economies become markedly more export oriented and shift to an export led growth

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1) Pazyński (1981), p. 43.
2) Nayyar (1981), p. 80.
3) Paszyński (1981), pp. 88, 89.
4) Paszyński (1981), p.. 41, 42, 51, 54. Remarkably enough, structural changes in the developing countries seem to be sometimes regarded as practically indepdendent of East-South trade.
5) See Paszyński (1979), p. 524.

strategy.[1] This, in turn, would have to be linked with substantial modifications in their systems of economic management. An explicit link is frequently also established between an improvement of East-South economic relations and an improvement within CMEA integration. A specific proposal is the participation of interested developing countries in CMEA integration schemes, particularly in the so-called Long-term Target Programmes of Cooperation.[2] This cooperation modality, though regarded as promising, is for the time being 'only in the phase of investigation and experimentation' and 'will for the moment not have an impact on trade'.[3]

We turn now to the perspectives of the commodity composition of East-South trade.

Eastern trade policies vis-à-vis the South and Eastern economists' views on trade perspectives all have this in common, that they take the growing import requirements of the CMEA region and, implicitly, growing shares in imports of fuels as the starting point.[4] Some authors expect Eastern imports of raw materials and primary commodities to more or less stabilize (in terms of shares), and imports of certain food items (such as tropical products), of fodder and possibly of other consumer goods to 'increase considerably'.[5] This implies that manufactures are expected to continue to play a subordinate role in Eastern imports from the South.

The only quantitative estimate presented so far on East-South trade until the year 1990 in a broad commodity group breakdown was made by the

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1) Paszyński (1981), p. 42.
2) e.g. Shmelev (1979), pp. 320-321, Stefanov (1980), p. 78, Sotrodnichestvo (1980), p. 188.
3) UNCTAD TD/B/808 (1980), p. 30.
4) A notable exception is represented by the view that 'the share of finished and semi-finished products, and also of raw materials of the first processing stage will increase substantially (Sotrudnichestvo (1980), p. 186). It is not quite clear why Eastern imports of unprocessed raw materials, particularly of crude oil, should grow at below average rates.
5) Paszyński (1981), p. 41.

Institute for World Economy at the Hungarian Academy of Sciences.[1] Their forecast differs somewhat from the above view in that they expect that the share of manufactures in Eastern imports will very likely increase (from 11 % in 1977) to 20-25 % by 1990; however, they do not elaborate the assumptions leading to this result.[2] At the same time, the shares of raw materials other than fuels and of agricultural products, which are obviously treated as residual variable, would decrease. The share of fuels would increase from 20.5 % (1977) to as much as 35-45 % in 1990.

As to the CMEA countries' exports to the South, the general assumption is that machinery and equipment, especially complete plants, will be the fastest growing flow.[3] The Hungarian projection forecasts an increase of Eastern exports of SITC 7 by 13 percentage points (1977-1990), adding, however, that this assumption poses probably the greatest question mark.[4]

The basic assumptions underlying the Hungarian projection are, as the authors themselves admit, fairly optimistic.[5] At their presentation its results were accordingly criticized as over-optimistic. But even so, the projected commodity composition was labelled 'revealing' by D. Nayyar, one of the critics. The degree of concentration of Eastern exports on manufactures would even rise to 80 percent while the major change in

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1) Economic Relations between the European CMEA Countries and the Developing Countries and their Role in Development (1980), pp. 296 ff. and Dobozi and Inotai (1981), pp. 60-65. The main aggregate results of the study may be summarized as follows: East-South trade will grow about twice as fast as total would trade and significantly faster than total trade of the CMEA countries. Trade of the CMEA countries vis-à-vis the South will be balanced at best by 1990.
2) The 20-25 % share relates to SITC groups 5 to 8, including SITC 68.
3) Dobozi and Inotai (1981), Sotrudnichestvo (1980), p. 186.
4) Dobozi and Inotai (1981), p. 63. According to the authors, the share of SITC 7 in Eastern exports would increase from 42.2 % (1977) to 55 % (1990). In our set of data the 1977 share is 28.4 % only. The difference in the two figures is practically due to the use of different denominators: whereas we used the UNCTAD figure for total trade (US $ 14515 mln.), Dobozi and Inotai must have used to a figure close to the US $ 9875 mln. that are arrived at by adding up UN figures for individual SITC categories. See also the remarks on the data basis in 2.1.
5) Dobozi and Inotai (1981), p. 64.

imports would be a replacement (in terms of shares) of agricultural products and materials (SITC 2 and 4) by fuels and, to a much smaller extent, by manufactures; which is, again in the words of D. Nayyar, 'clearly not the basis for a new international division of labour.[1)]

A substantial part of the commonly assumed rapid increase in Eastern machinery and equipment exports would presumably have to be financed by Eastern credits. This leads us to industrial cooperation in general and to compensation arrangements in particular. The CMEA countries seem to desire a perceptible expansion of industrial cooperation and especially compensation based credit arrangements with the Third World countries.[2)] The main motivation for this and the basic Eastern criteria for the choice of specific projects are 'the possibilities of satisfying certain long-term requirements of CMEA countries through steady deliveries of enterprises installed with their help'.[3)] Logically, here too, activities connected with raw materials and fuels are in the centre of Eastern interests (reaching from geological prospecting to mining, primary processing and transport). As for other areas of special interest in cooperation with the developing countries, various lists can be found. They comprise, typically, power generation, transport and communications and agriculture (including cultivation, irrigation and melioration projects). In some lists, manufacturing branches are not even mentioned, in others they are referred to in a rather vague way ('compensation agreements in manufacturing branches will develop in future'). A notable exception is a list found in a Russian source that designates the bulk of manufacturing branches as 'priority' areas of cooperation.[4)]

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1) Nayyar (1981), p. 80.
2) Sotrudnichestvo (1981), p. 43, UNCTAD TD/B/806 (1980), p. 28.
3) Smelev (1979), p. 320.
4) Sotrudnichestvo (1980), pp. 46, 133, Prokhorov (1979), p. 85, Dobozi and Inotai (1981), p. 52. It is expected that cooperation will extend to various services and other immaterial exports by the CMEA countries, such as building operations, construction, exploration, drilling of wells, setting up communications, engineering, organization of production, management, joint marketing and after-sales activities, partly in the framework of joint ventures. (UNCTAD TD/B/808 (1980), p. 18+31, Dobozi and Inotai (1981), p. 55, UNCTAD TD/B/806 (1980), p. 22).

Possible limits to the expansion of compensation arrangements may be located in both the Eastern and the Southern sphere. On the one hand, increasing scarcity of capital and financial resources may oblige the CMEA countries to a more selective approach in the choice of projects, which would then be more closely tied to the economic concerns of the donor countries.[1] It is frequently argued that buy-back deals with the developing countries ought to be considered, to a certain extent, as alternative to domestic investment.[2] On the other hand, the willingness of the developing countries to enter into new compensation agreements might be limited, especially if their demands for increased manufactured exports are not acceded to by the Eastern countries. As far as raw materials and fuels (and oil in particular) are concerned, the South also may show only limited interest owing to the fact that these commodities are easily saleable for hard currencies on the World market.

There is a broad consensus that the established institutional machinery should be used more efficiently and that the existing mechanisms and forms of economic cooperation be made more flexible.[3] In particular, bilateral forms of cooperation are expected to be increasingly supplemented by multilateral forms, such as buy-back deals with the participation of two or more CMEA countries, cooperation in third countries and tripartite cooperation arrangements.[4] The joint compensation based establishment of enterprises or (more comprehensive) production complexes by two or more Eastern countries is primarlily envisaged for turnkey plants in extractive industries and primary processing where capital requirements are high and could be met more easily by shared financing.[5] It is

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1) Kanet (1981), p. 311.
2) Shmelev (1979), p. 320, Paszyński (1981), p. 40, Prokhorov (1979), p. 84.
3) See e.g. UNCTAD TD/B/759 (1979), p. 14.
4) Among the issues most frequently mentioned in this context are cooperation of a developing country with the CMEA and its organizations (such as the participation in the Long-term Target Programmes of Cooperation, see above) and the use of the transferable rouble as means of accounting and payment. Sotrudnichestvo (1980), pp. 147-149.
5) Kanet (1981), p. 324, Sotrudnichestvo (1980), p. 186.

argued that yet another factor favouring the development of this form of industrial cooperation is intra-CMEA cooperation and spezialization in the production of various types and parts of machinery and equipment.[1] Here again, a link is established between the improvement and multilateralization of East-South cooperation and of CMEA integration.[2]

Joint ventures are also believed to be a promising form of industrial cooperation between East and South. These, it is felt in the East, are preferably to operate, once more, in the fields of raw materials and fuels, with the OPEC countries often mentioned as the most desirable partners.[3]

Among the Third World, developing countries of socialist orientation, the more advanced developing countries, geographically close countries and countries rich in natural resources are regarded as preferred partners of trade and industrial cooperation.[4] As a considerable number of these countries are precisely those that the West, too, will be most interested in, competition between East and West is to be expected to get keener in relation to these countries, both as export outlets and as sources of fuels and raw materials. The least developed countries, if mentioned at all, are considered as possible target areas of cooperation between OPEC and Eastern countries, with the East supplying machinery and equipment on the basis of credits to be granted by some OPEC countries to the NOPEC country.[5]

For some time now the developing countries have been voicing their dissatisfaction with the low volume and with the commodity composition of what the Eastern countries import from them. As a reaction to these

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1) Sotrudnichestvo (1980), pp. 140 ff.
2) ibid., p. 125. This relates to the introduction of the transferable rouble in East-South relations as well (ibid, pp. 150-154).
3) Dobrovol'skiy (1979), p. 98.
4) Sotrudnichestvo (1980), pp. 128, 185-186, Paszyński (1981), p. 43/44, Prokhorov (1979), p. 85.
5) Sotrudnichestvo (1980), p. 162, Kuzham'yarov (1979), pp. 48-52.

complaints an increasing number of general declarations of intent to increase Eastern imports of manufactured goods from the South have appeared in various documents and articles. However, at a more detailed level of discussion, the attitude still prevails in the East that regards the developing countries mainly as suppliers of - urgently needed - raw materials, above all of oil, and, at best, of semi-finished products of a low degree of processing, to be paid for by Eastern exports of manufactures, particularly of capital goods.

Some Eastern experts, on the other hand, see that such a policy will be less and less tenable in the future, when the pressure of the South for increased sales of manufactures to the East and international competition for outlets of manufactured goods and for supplies of fuels are bound to rise. These experts conclude that, despite a certain reluctance on the part of the East, it will have to accomodate itself to a policy shift as soon as possible. This would mean that raw material imports from the South can "hardly become the most dynamic sector of (East-South) trade" and that the CMEA countries will have to examine more closely what manufactures they can import in increasing quantities from the developing countries.[1] On the other hand, Eastern exports to the South of manufactures in general and of investment goods in particular are obviously often regarded as an easier alternative to exports to the West, which may endanger the future development of Eastern exports[2] to the South in a longer perspective.

However, it is to be expected that it will take quite a time until considerations of this kind will be reflected in actual Eastern trade policies vis-à-vis the South and in actual trade flows.

Summing up we come to the conclusion that the chances for a full utilization of the growth potential of East-South trade are rather limited. In the years to come East-South trade will, very likely, basically remain a residual with very little interaction with manufacturing industries in both regions.

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1) Paszyński (1979), p. 525, Palócz-Németh (1980), p. 62.
2) Palócz-Németh (1981), p. 63.

SUMMARY

The progressive industrialization during the period 1966 to 1979 sustained a dynamic output growth of manufacturing industries in the CMEA countries, together with pronounced shifts in the branch composition. The profile of expansion was rather similar throughout the area. Machine building and chemicals expanded on average at a much faster rate than total manufacturing industry, while the growth elasticity of the wood and wood processing, light and food industries was generally below unit.

Undoubtedly an important factor in the pattern described was the increase in per capita income levels, which took place during this period and brought about a changing pattern of domestic demand for products of the various branches. However, the income factor is less visible in inter-country differences in the gross output structure of manufacturing industry. National industrial policies and other factors, such as resource endowment, economies of scale, and certainly to a lesser degree comparative advantage in foreign trade, seem to have modifying effects.

Although the growth profiles of individual countries were similar, the branch structure of gross output became more similar during the period under investigation. There where only three small branches - construction materials, printing and clothing - where the dispersion of shares in 1979 was higher than at the beginning of the period considered. As to the remaining branches, inter-country specialization in the area developed within rather than between these branches.

The CMEA countries attained structural changes in employment primarily by allocating the additional labour employed in manufacturing industry disproportionately to the various branches. The impact of the shifts in employment structure on growth of labour productivity in aggregate manufacturing industry was favourable for all countries except the GDR. However, the structural component influenced the development of gross output per employee only to a very small extent. Growth of aggregate labour productivity was mainly the result of gains in productivity

within branches and the rapid expansion of manpower in some branches provided, to some extent, the possbility for their above average labour productivity gains.

Differences between branches in the growth of labour productivity were very pronounced, the pattern of differentiation being rather close to that of the growth of output. Labour productivity expanded relatively fast in chemicals and machine building and relatively slowly in wood and wood processing, pulp and paper, light and food industries.

In the great majority of branches the rate of growth of labour productivity tended to slow down over time, while the contribution of labour productivity growth to growth of output increased. The highest contribution to output growth can be found in Czechoslovakia and Hungary and the smallest in Romania.

Taking the period as a whole, the incremental gross investment-output ratios in total manufacturing industry developed unfavourable in all countries except Czechoslovakia and the Soviet Union. The impact of shifts in the structure of gross output was unfavourable only for Romania, while structural changes in the other countries influenced the development of the investment efficiency positively. However, shifts in the structure of output affected aggregate gross investment-output ratios only to a small extent.

Changes in the incremental gross investment-output ratio by branches did not follow a well defined pattern. Considering the period as a whole the chemical industry is the only branch where the ratio deteriorated in any country, while light and food industries in most countries experienced a rather marked decline in investment efficiency.

Capital intensity varies greatly between branches, while a great similarity is evident when country patterns are compared. Chemicals, pulp and paper and construction materials are characterized in all countries by high capital requirement per employee, while wood and wood proces-

sing, glass, printing and light industries are branches of relatively low capital intensity. Machine building shows a below average level of capital intensity in most countries, while the level in food industry is above the national average in all countries except Bulgaria.

The correlation analyses performed between different growth indicators reveal a strong inter-country and intersectoral association between the growth of output and employment, which tended to become weaker while that between output and labour productivity became stronger in the second half of the 1970s than in the two five-year periods before.

During the period under investigation differences between the branch breakdown of output, employment and investment (area averages) became substantially smaller. Beyond this there are several macro-structural considerations which explain why the rapid expansion of the manufacturing industry in the CMEA countries during the period 1966-1979 will not continue in future:

(i) the slowdown in manpower supply;

(ii) the general lagging behind of the services sector in the CMEA countries;

(iii) rising relative costs of raw material requirements for industry.

Extrapolation of past trends of output may be taken as a possible yardstick for future development. The projected branch growth rates of the individual countries between 1980 and 1990 show a marked deceleration of manufacturing expansion which is produced by a declining tendency in all branch growth rates. The above-unit growth elasticities of machine building and chemicals would decline appreciably while the importance of the other branches would not decline as rapidly as in the past. The implied marked slowdown in the rate of structural change would result in a slackening of the movement towards convergence. While somewhat rising opportunities, compared with the present, are indicated for trade specialization between branches, the general pattern of inter-country specialization at the branch level within the area would hardly change in the 1980s.

Due to lack of data and methodological problems, interdependencies between total foreign trade and structural change in manufactures output were not investigated in this study. The question whether these difficulties could be overcome remains to be investigated at a later stage.

The analysis of the CMEA countries' trade with the developing countries did not indicate such an interdependence; on the contrary, it has led to the conclusion that East-South trade is still predominantly regarded, by the CMEA countries' policy makers, as "aid" and has the characteristics of a mere residual. A change of attitude can be found only with a few, mainly Hungarian, researchers, who underline the necessity to import more manufactures from the developing countries. It remains to be seen whether this will influence policy makers in the future.

The high hard currency debt of the CMEA countries and the need of these countries to secure fuel and raw materials imports from outside the CMEA area (because of a slowdown of fuel and raw material deliveries from the USSR) set narrow limits for the CMEA countries, if they contemplate to increase imports of manufactures from the developing countries at a significant rate.

This makes it difficult for the smaller CMEA countries to develop the up to now very weak contacts to the major producers of manufactures among the developing countries, while the USSR, from the point of view of her balance of payments position, would be able to increase imports of manufactures from developing countries substantially. But up to now they have not been willing to meet their domestic consumers' demand in coffee, cocoa, bananas and other traditional export commodities of developing countries.

A P P E N D I X A

Basic Statistical Tables
to Part I, Chapter 1

Table A.1

Percentage distribution of gross output by branches[1)]

Total manufacturing = 100

	1965	1970	1975	1979
Bulgaria				
Machine building and metal processing	20.6	25.5	32.1	36.2
Chemicals and rubber	6.0	9.5	10.6	11.6
Construction materials	4.8	4.8	4.8	5.0
Glass, china and ceramics	1.0	1.1	1.1	1.1
Wood and wood processing	5.9	4.6	3.9	3.3
Pulp and paper	1.0	1.3	1.4	1.3
Printing	0.6	0.6	0.5	0.6
Textiles and knitwear	12.7	11.7	10.6	10.0
Clothing	5.3	6.1	5.6	4.7
Leather, furs and footwear	2.3	2.4	2.1	1.7
Food (incl. beverages and tobacco)	39.8	32.3	27.4	24.5
Czechoslovakia				
Machine building and metal processing	36.7	40.7	43.1	45.9
Chemicals and rubber	8.4	9.6	10.9	11.1
Construction materials	4.7	4.6	4.5	4.3
Glass, china and ceramics	2.0	2.0	2.0	2.0
Wood and wood processing	5.1	4.6	4.5	4.5
Pulp and paper	2.7	2.5	2.4	2.3
Printing	0.8	1.0	0.8	0.8
Textiles and knitwear	8.1	7.2	6.8	6.3
Clothing	2.8	2.6	2.4	2.2
Leather, furs and footwear	3.7	3.4	3.2	3.0
Food (incl. beverages and tobacco)	25.1	21.7	19,3	17.6
German Democratic Republic				
Machine building and metal processing	36.1	39.4	39.9	42.5
Chemicals and rubber	12.7	13.0	14.4	14.5
Construction materials	2.8	2.7	2.8	2.6
Glass, china and ceramics	1.3	1.3	1.3	1.4
Wood and wood processing	3.8	3.9	3.9	3.9
Pulp and paper	2.3	2.2	2.1	2.0
Printing	1.2	1.0	1.0	.8
Textiles and knitwear	8.8	8.0	7.6	7.2
Clothing	2.9	2.7	2.5	2.3
Leather, furs and footwear	2.1	2.1	2.0	2.0
Food (incl. beverages and tobacco)	26.2	23.6	22.6	20.7
Hungary				
Machine building and metal processing	38.1	40.1	41.8	42.3
Chemicals and rubber	9.6	12.6	14.5	17.0
Construction materials	3.5	3.1	2.6	2.5
Glass, china and ceramics	1.1	1.3	1.3	1.4
Wood and wood processing	4.5	3.8	4.0	3.9
Pulp and paper	1.0	1.1	1.1	1.1
Printing	1.1	1.3	1.3	1.3
Textiles and knitwear	9.4	7.5	6.5	5.8
Clothing	4.1	3.9	3.5	3.0
Leather, furs and footwear	3.0	2.8	2.6	2.1
Food (incl. beverages and tobacco)	24.6	22.6	20.7	19.5

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1) calculated, using the percentage distribution of 1970 as a base

Table A.1 (continued)

Percentage distribution of gross output by branches

Total manufacturing = 100

	1965	1970	1975	1979
Poland				
Machine building and metal processing	28.4	34.3	39.4	43.6
Chemicals and rubber	9.3	11.7	12.0	11.7
Construction materials	4.6	4.3	3.7	3.2
Glass, china and ceramics	1.0	1.0	1.1	1.3
Wood and wood processing	5.4	4.8	4.7	4.6
Pulp and paper	2.1	1.8	1.5	1.2
Printing	0.6	0.5	0.5	0.5
Textiles and knitwear	11.4	10.7	9.3	8.6
Clothing	4.2	4.3	4.4	4.0
Leather, furs and footwear	3.2	2.9	2.5	2.3
Food (incl. beverages and tobacco)	29.8	23.5	21.0	19.2
Romania				
Machine building and metal processing	27.1	31.9	39.1	42.6
Chemicals and rubber	9.1	13.2	14.6	14.3
Construction materials	4.4	4.6	4.0	4.5
Glass, china and ceramics	0.6	0.6	0.7	0.6
Wood and wood processing	10.7	8.3	6.0	5.1
Pulp and paper	1.6	1.8	1.5	1.3
Printing	0.5	0.4	0.2	0.2
Textiles and knitweare	9.5	9.2	8.7	8.7
Clothing	5.2	5.3	6.3	5.8
Leather, furs and footwear	3.0	2.7	2.2	2.1
Food (incl. beverages and tobacco)	28.4	22.0	16.8	14.7
Soviet Union				
Machine building and metal processing	26.3	30)	35.6	40.5
Chemicals and rubber	7.4	8.5	9.7	9.8
Construction materials	5.5	5.4	5.3	4.7
Glass, china and ceramics	0.5	0.5	0.6	0.6
Wood and wood processing	6.6	5.6	4.8	4.2
Pulp and paper	1.0	1.0	1.0	0.9
Printing 1)	0.4	0.4	0.2	0.5
Textiles and knitwear	13.9	12.9	11.2	10.2
Clothing	5.1	6.1	5.2	5.2
Leather, furs and footwear	2.6	2.5	2.0	1.9
Food (incl. beverages and tobacco)	30.7	27.0	24.3	21.4
Area average (unweighted)				
Machine building and metal processing	30.5	34.6	38.7	42.0
Chemicals and rubber	8.9	11.2	12.4	12.9
Construction materials	4.3	4.2	4.0	3.8
Glass, china and ceramics	1.1	1.1	1.2	1.2
Wood and wood processing	6.0	5.1	4.5	4.2
Pulp and paper	1.7	1.7	1.6	1.5
Printing	0 7	0.7	0.6	0.7
Textiles and knitwear	10.5	9.6	8.7	8.1
Clothing	4.2	4.4	4.3	3.9
Leather, furs and footwear	2.8	2.7	2.4	2.2
Food (incl. beverages and tobacco)	29.2	24.7	21.7	19.7

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1) estimated

Table A.2

Percentage distribution of employment by branches

Total manufacturing = 100

	1965	1970	1975	1979
Bulgaria				
Machine building and metal processing	26.9	30.6	33.9	35.9
Chemicals and rubber	5.5	7.2	8.0	8.2
Construction materials	6.7	5.7	5.9	6.1
Glass, china and ceramics	2.4	2.3	2.5	2.6
Wood and wood processing	11.5	9.8	8.4	7.3
Pulp and paper	1.3	1.3	1.5	1.8
Printing	1.0	1.1	1.1	1.2
Textiles and knitwear	13.6	13.6	13.4	12.9
Clothing	7.1	7.1	6.7	6.3
Leather, furs and footwear	3.3	3.5	3.3	3.0
Food (incl. beverages and tobacco)	20.5	17.7	15.4	14.8
Czechoslovakia				
Machine building and metal processing	45.8	46.5	46.4	47.6
Chemicals and rubber	5.5	5.8	6.1	6.1
Construction materials	4.8	4.7	4.6	4.6
Glass, china and ceramics	3.4	3.6	3.7	3.6
Wood and wood processing	6.0	5.7	5.8	5.8
Pulp and paper	1.8	2.0	2.0	2.0
Printing	1.4	1.5	1.5	1.4
Textiles and knitwear	11.2	10.5	10.3	9.9
Clothing	5.5	5.3	5.1	4.7
Leather, furs and footwear	4.8	4.8	4.9	4.7
Food (incl. beverages and tobacco)	9.9	9.6	9.6	9.4
German Democratic Republic				
Machine building and metal processing	45.5	49.0	49.9	50.4
Chemicals and rubber	10.4	10.1	10.5	10.4
Construction materials	3.7	3.6	3.7	3.7
Glass, china and ceramics	2.2	2.1	2.4	2.5
Wood and wood processing	3.8	3.5	4.8	4.7
Pulp and paper	1.9	1.8	2.0	1.9
Printing	1.9	1.7	1.4	1.3
Textiles and knitwear	13.6	11.3	9.5	8.7
Clothing	4.9	4.7	4.5	4.1
Leather, furs and footwear	3.0	2.9	3.0	2.8
Food (incl. beverages and tobacco)	9.1	9.3	8.6	9.5
Hungary				
Machine building and metal processing	40.0	41.2	41.7	42.2
Chemicals and rubber	7.0	7.6	8.0	8.0
Construction materials	4.9	4.1	3.8	3.8
Glass, china and ceramics	2.0	2.2	2.5	2.6
Wood and wood processing	6.2	4.9	4.9	4.6
Pulp and paper	1.1	1.3	1.3	1.3
Printing	1.6	1.6	1.6	1.6
Textiles and knitwear	12.9	11.4	10.2	9.7
Clothing	5.1	5.8	6.2	6.0
Leather, furs and footwear	4.9	5.3	5.2	5.0
Food (incl. beverages and tobacco)	14.4	14.4	14.7	15.4

Table A.2 (continued)

Percentage distribution of employment by branches

Total manufacturing = 100

	1965	1970	1975	1979
Poland				
Machine building and metal processing	35.5	38.4	39.7	41.9
Chemicals and rubber	8.4	8.6	8.5	8.3
Construction materials	6.4	6.0	5.2	4.8
Glass, china and ceramics	2.3	2.2	2.3	2.4
Wood and wood processing	6.1	5.8	5.7	5.5
Pulp and paper	1.8	1.7	1.6	1.4
Printing	1.5	1.4	1.3	1.3
Textiles and knitwear	14.4	13.3	12.6	11.8
Clothing	5.3	5.3	5.5	5.4
Leather, furs and footwear	4.0	4.0	4.0	3.9
Food (incl. beverages and tobacco)	14.4	13.3	13.6	13.3
Romania				
Machine building and metal processing	28.8	30.8	37.0	40.0
Chemicals and rubber	6.6	7.7	7.9	8.0
Construction materials	7.0	6.6	5.3	5.0
Glass, china and ceramics	1.6	1.6	1.7	1.9
Wood and wood processing	19.1	16.5	12.7	11.0
Pulp and paper	1.8	1.6	1.4	1.3
Printing	1.5	1.2	0.8	0.7
Textiles and knitwear	12.4	12.6	12.9	13.0
Clothing	5.9	6.7	7.3	6.9
Leather, furs and footwear	4.6	4.8	4.2	4.0
Food (incl. beverages and tobacco)	10.8	9.9	8.7	8.1
Soviet Union[1]				
Machine building and metal processing	42.9	44.8	47.3	48.6
Chemicals and rubber	5.8	6.1	6.4	6.4
Construction materials	7.8	7.7	7.6	7.3
Glass, china and ceramics	1.2	1.1	1.2	1.2
Wood and wood processing	11.1	9.6	8.6	8.0
Pulp and paper	0.9	1.0	0.9	0.9
Printing[2]	0.9	0.8	0.6	1.1
Textiles and knitwear	8.4	7.8	7.3	7.1
Clothing	7.2	7.8	7.4	8.0
Leather, furs and footwear	2.7	2.6	2.4	2.3
Food (incl. beverages and tobacco)	11.1	10.7	10.2	9.1
Area average (unweighted)				
Machine building and metal processing	37.9	40.2	42.3	43.8
Chemicals and rubber	7.0	7.6	7.9	7.9
Construction materials	5.9	5.5	5.2	5.0
Glass, china and ceramics	2.2	2.2	2.3	2.4
Wood and wood processing	9.1	8.0	7.3	6.7
Pulp and paper	1.5	1.5	1.5	1.5
Printing	1.4	1.3	1.2	1.2
Textiles and knitwear	12.4	11.5	10.9	10.4
Clothing	5.8	6.1	6.1	5.9
Leather, furs and footwear	3.9	4.0	3.8	3.7
Food (incl. beverages and tobacco)	12.9	12.1	11.5	11.4

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1) The employment structure for 1979 has been calculated using the indices of gross production and labour productivity

2) estimated

Table A.3

Percentage distribution of investment by branches
Total manufacturing = 100

	1965	1970	1975	1979
Bulgaria				
Machine building and metal processing	27.8	30.8	29.4	39.5
Chemicals and rubber	20.4	24.8	19.3	22.2
Construction materials	8.4	6.0	11.5	14.9
Glass, china and ceramics	3.6	1.8	2.8	1.1
Wood and wood processing	6.1	5.1	4.6	2.9
Pulp and paper	3.8	3.5	2.3	1.8
Printing	0.5	1.4	1.0	1.0
Textiles and knitwear	9.2	9.0	8.5	3.5
Clothing	0.8	1.0	1.9	0.4
Leather, furs and footwear	1.3	1.4	1.1	0.5
Food (incl. beverages and tobacco)	18.1	15.3	17.6	12.1
Czechoslovakia				
Machine building and metal processing	33.7	29.1	35.9	41.5
Chemicals and rubber	24.3	20 4	16.1	11.7
Construction materials	7.2	10.3	10.2	8.3
Glass, china and ceramics	3.9	2.7	2.4	2.5
Wood and wood processing	3.6	5.2	5.7	5.4
Pulp and paper	4.0	5.4	4.0	6.6
Printing	0.9	1.6	1.8	0.9
Textiles and knitwear	7.7	10.5	7.5	7.2
Clothing	1.0	1.1	0.6	1.1
Leather, furs and footwear	1.3	1.8	2.4	1.9
Food (incl. beverages and tobacco)	12.4	11.9	13.3	12.9
German Democratic Republic[1)]				
Machine building and metal processing	43.8	49.0	44.4	46.9
Chemicals and rubber	30.8	24.0	25.5	27.2
Construction materials	7.9	10.2	8.7	7.4
Textiles and knitwear	6.7	6.7	7.5	6.3
Food (incl. beverages and tobacco)	10.8	10.2	13.9	12.3
Hungary				
Machine building and metal processing	31.1	32.5	26.1	32.1
Chemicals and rubber	24.6	18.4	23.0	16.1
Construction materials	4.3	9.7	8.0	8.0
Glass, china and ceramics	2.4	2.9	2.2	3.0
Wood and wood processing	3.1	1.8	2.3	1.8
Pulp and paper	5.5	5.5	4.6	1.4
Printing	0.7	1.9	2.5	2.3
Textiles and knitwear	9.6	6.5	7.7	6.3
Clothing	0.5	0.8	1.2	0.9
Leather, furs and footwear	1.8	1.6	1.9	1.3
Food (incl. beverages and tobacco)	16.4	18.5	20.6	26.7

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1) Data for only five branches are available

Table A.3 (continued)

Percentage distribution of investment by branches

Total manufacturing = 100

	1965	1970	1975	1979
Poland				
Machine building and metal processing	31.3	34.4	39.4	41.9
Chemicals and rubber	24.7	21.6	15.5	21.2
Construction materials	9.7	11.1	10.0	4.9
Glass, china and ceramics	2.2	2.1	1.0	2.3
Wood and wood processing	2.2	2.8	4.8	2.7
Pulp and paper	5.1	3.2	2.3	4.6
Printing	1.2	0.8	1.2	0.4
Textiles and knitwear	6.7	8.3	8.2	4.9
Clothing	0.6	0.8	0.8	0.8
Leather, furs and footwear	0.7	1.5	0.9	0.7
Food (incl. beverages and tobacco)	15.6	13.3	15.9	15.6
Romania				
Machine building and metal processing	16.0	35.2	35.0	42.7
Chemicals and rubber	29.2	20.6	26.9	28.7
Construction materials	9.4	10.7	8.5	7.6
Glass, china and ceramics	0.6	3.3	0.7	1.4
Wood and wood processing	14.1	7.9	6.0	3.5
Pulp and paper	12.9	2.7	2.8	2.2
Printing	0.4	0.4	0.3	0.1
Textiles and knitwear	5.6	6.5	6.3	5.4
Clothing	0.9	1.0	1.0	0.5
Leather, furs and footwear	1.1	0.7	0.8	0.5
Food (incl. beverages and tobacco)	9.8	11.0	11.5	7.5
Soviet Union				
Machine building and metal processing	31.4	39.6	44.1	45.6
Chemicals and rubber	21.6	16.2	18.1	18.7
Construction materials	10.1	11.6	8.8	8.2
Glass, china and ceramics	0.7	1.0	0.8	0.5
Wood and wood processing	7.0	6.8	5.4	5.0
Pulp and paper	4.3	2.2	2.5	2.4
Printing	0.5	0.7	0.7	0.8
Textiles and knitwear	5.5	4.9	4.5	4.7
Clothing	0.5	0.8	0.6	0.6
Leather, furs and footwear	0.7	1.0	1.0	0.7
Food (incl. beverages and tobacco)	17.7	15.2	13.4	12.8
Area average (unweighted)[1)]				
Machine building and metal processing	28.5	33.6	35.0	40.6
Chemicals and rubber	24.1	20.3	19.8	19.8
Construction materials	8.2	9.9	9.5	8.6
Glass, china and ceramics	2.2	2.3	1.7	1.8
Wood and wood processing	6.0	5.0	4.8	3.5
Pulp and paper	5.9	3.8	3.1	3.2
Printing	0.7	1.1	1.3	0.9
Textiles and knitwear	7.4	7.6	7.1	5.3
Clothing	0.7	0.9	1.0	0.7
Leather, furs and footwear	1.1	1.3	1.3	1.0
Food (incl. beverages and tobacco)	15.0	14.2	15.4	14.6

1) Excluding German Democratic Republic

Table A.4

Average annual percentage change in gross output by branches

	1966-70	1971-75	1976-79	1966-79
Bulgaria				
Total manufacturing	10.5	9.4	6.8	9.0
Machine building and metal processing	15.3	14.5	10.1	13.5
Chemicals and rubber	21.4	11.7	9.3	14.3
Construction materials	10.4	9.2	8.1	9.3
Glass, china and ceramics	13.1	8.4	7.1	9.7
Wood and wood processing	4.8	5.9	2.7	4.6
Pulp and paper	15.3	12.0	3.8	10.7
Printing	11.9	3.9	12.4	9.1
Textiles and knitwear	8.7	7.3	5.4	7.2
Clothing	13.5	7.6	2.0	8.0
Leather, furs and footwear	11.9	6.7	1.1	6.8
Food (incl. beverages and tobacco)	5.9	5.9	3.9	5.3
Czechoslovakia				
Total manufacturing	7.1	7.2	5.5	6.7
Machine building and metal processing	9.3	8.4	7.2	8.4
Chemicals and rubber	10.0	10.0	6.0	8.8
Construction materials	6.8	6.7	4.4	6.1
Glass, china and ceramics	7.7	6.7	5.7	6.7
Wood and wood processing	5.1	6.5	5.9	5.8
Pulp and paper	5.4	7.0	4.5	5.7
Printing	11.5	4.4	4.0	6.8
Textiles and knitwear	4.8	5.9	3.6	4.8
Clothing	5.4	5.2	3.5	4.8
Leather, furs and footwear	5.6	6.0	3.4	5.1
Food (incl. beverages and tobacco)	4.0	4.7	3.0	4.0
German Democratic Republic				
Total manufacturing	6.2	6.4	5.0	5.9
Machine building and metal processing	8.0	6.7	6.7	7.2
Chemicals and rubber	6.8	8.4	5.2	6.9
Construction materials	5.6	7.0	3.1	5.4
Glass, china and ceramics	5.9	7.1	5.7	6.3
Wood and wood processing	6.5	6.7	5.2	6.2
Pulp and paper	5.6	5.1	4.6	5.1
Printing	3.8	4.7	1.9	3.6
Textiles and knitwear	4.3	5.2	3.8	4.5
Clothing	4.8	4.4	3.1	4.2
Leather, furs and footwear	6.2	6.0	4.7	5.7
Food (incl. beverages and tobacco)	4.0	5.4	2.8	4.2
Hungary				
Total manufacturing	6.6	7.0	5.2	6.3
Machine building and metal processing	7.7	7.9	5.5	7.1
Chemicals and rubber	12.7	10.0	9.4	10.8
Construction materials	3.8	3.5	4.1	3.8
Glass, china and ceramics	9.7	8.4	6.4	8.3
Wood and wood processing	2.8	8.2	4.7	5.2
Pulp and paper	9.3	7.4	5.0	7.4
Printing	9.3	7.9	5.8	7.8
Textiles and knitwear	1.9	4.1	2.0	2.7
Clothing	5.4	4.9	1.0	3.9
Leather, furs and footwear	4.8	5.2	0.4	3.7
Food (incl. beverages and tobacco)	4.8	5.1	3.7	4.6

Table A.4 (continued)

Average annual percentage change in gross output by branches

	1966-70	1971-75	1976-79	1966-79
Poland				
Total manufacturing	8.1	11.3	6.1	8.7
Machine building and metal processing	12.3	14.4	8.3	12.0
Chemicals and rubber	13.1	12.0	5.4	10.4
Construction materials	6.8	8.2	1.6	5.8
Glass, china and ceramics	8.7	11.7	11.2	10.5
Wood and wood processing	5.6	10.5	5.4	7.5
Pulp and paper	5.1	6.7	1.1	4.5
Printing	6.8	8.0	9.2	7.9
Textiles and knitwear	6.8	8.0	4.2	6.5
Clothing	8.7	11.6	3.7	8.2
Leather, furs and footwear	6.2	7.9	4.3	6.3
Food (incl. beverages and tobacco)	3.1	8.9	3.7	5.3
Romania				
Total manufacturing	12.0	13.4	10.9	12.2
Machine building and metal processing	15.8	18.1	13.3	15.9
Chemicals and rubber	20.7	15.7	10.4	15.9
Construction materials	13.1	10.1	14.8	12.5
Glass, china and ceramics	12.3	14.5	9.5	12.3
Wood and wood processing	6.5	6.3	6.5	6.4
Pulp and paper	14.4	9.2	7.8	10.6
Printing	7.1	1.7	6.3	4.9
Textiles and knitwear	11.1	12.2	11.0	11.5
Clothing	12.7	17.3	8.5	13.1
Leather, furs and footwear	9.7	9.2	9.1	9.3
Food (incl. beverages and tobacco)	6.5	7.4	7.4	7.1
Soviet Union				
Total manufacturing	8.6	7.7	5.1	7.3
Machine building and metal processing	11.5	11.5	8.6	10.6
Chemicals and rubber	11.9	10.4	5.6	9.5
Construction materials	8.3	7.1	2.1	6.1
Glass, china and ceramics	10.8	10.7	6.9	9.6
Wood and wood processing	5.1	4.7	1.2	3.8
Pulp and paper	8.7	7.0	2.2	6.2
Printing	n.a.	n.a.	n.a.	n.a.
Textiles and knitwear	7.1	4.7	2.7	5.0
Clothing	12.3	4.6	4.7	7.3
Leather, furs and footwear	7.1	3.4	4.0	4.9
Food (incl. beverages and tobacco)	5.9	5.4	1.9	4.6
Area Average (unweighted)				
Total manufacturing	8.4	8.9	6.4	8.0
Machine building and metal processing	11.4	11.6	8.6	10.7
Chemicals and rubber	13.8	11.1	7.3	11.0
Construction materials	7.8	7.4	5.5	7.0
Glass, china and ceramics	9.7	9.7	7.5	9.0
Wood and wood processing	5.2	7.0	4.5	5.6
Pulp and paper	9.1	7.7	4.1	7.2
Printing[1)]	8.4	5.1	6.6	6.7
Textiles and knitwear	6.4	6.8	4.7	6.0
Clothing	9.0	7.9	3.8	7.1
Leather, furs and footwear	7.4	6.3	3.9	6.0
Food (incl. beverages and tobacco)	4.9	6.1	3.8	5.0

1) excluding Soviet Union

Table A.5

Growth elasticity by branches
(Total manufacturing = 1)

	1966-70	1971-75	1976-79	1966-79
Bulgaria				
Machine building and metal processing	1.46	1.55	1.48	1.50
Chemicals and rubber	2.03	1.25	1.36	1.59
Construction materials	0.99	0.97	1.20	1.03
Glass, china and ceramics	1.25	0.90	1.04	1.08
Wood and wood processing	0 46	0.62	0.40	0.51
Pulp and paper	1.46	1.27	0.55	1.19
Printing	1.13	0.41	1.32	1.01
Textiles and knitwear	0.83	0.77	0.79	0.80
Clothing	1.29	0.80	0.30	0.89
Leather, furs and footwear	1.13	0.71	0.16	0.76
Food (incl. beverages and tobacco)	0.56	0.62	0.57	0.59
Czechoslovakia				
Machine building and metal processing	1.31	1.17	1.31	1.25
Chemicals and rubber	1.41	1.39	1.08	1.32
Construction materials	0.96	0.92	0.80	0.90
Glass, china and ceramics	1.09	0.92	1.03	1.01
Wood and wood processing	0.72	0.90	1.06	0.87
Pulp and paper	0.76	0.97	0.82	0.85
Printing	1.62	0.61	0.73	1.01
Textiles and knitwear	0.68	0.82	0.65	0.72
Clothing	0.76	0.73	0.64	0.71
Leather, furs and footwear	0.79	0.84	0.61	0.76
Food (incl. beverages and tobacco)	0.57	0.66	0.55	0.60
German Democratic Republic				
Machine building and metal processing	1.29	1.04	1.34	1.21
Chemicals and rubber	1.10	1.32	1.05	1.17
Construction materials	0.91	1.09	0.61	0.91
Glass, china and ceramics	0.96	1.11	1.14	1.06
Wood and wood processing	1.05	1.04	1.04	1.05
Pulp and paper	0.91	0.79	0.91	0.87
Printing	0.61	0.74	0.39	0.61
Textiles and knitwear	0.69	0.82	0.77	0.76
Clothing	0.78	0.69	0.62	0.71
Leather, furs and footwear	1.00	0.94	0.94	0.97
Food (incl. beverages and tobacco)	0.65	0.84	0.55	0.70
Hungary				
Machine building and metal processing	1.17	1.12	1.06	1.13
Chemicals and rubber	1.92	1.43	1.82	1.71
Construction materials	0.58	0.51	0.80	0.60
Glass, china and ceramics	1.47	1.21	1.22	1.32
Wood and wood processing	0.43	1.17	0.91	0.83
Pulp and paper	1.41	1.06	0.97	1.18
Printing	1.41	1.12	1.12	1.24
Textiles and knitwear	0.29	0.58	0.38	0.43
Clothing	0.81	0.70	0.19	0.62
Leather, furs and footwear	0.73	0.75	0.07	0.58
Food (incl. beverages and tobacco)	0.73	0.72	0.71	0.73

Table A.5 (continued)

Growth elasticity by branches
(Total manufacturing = 1)

	1966-70	1971-75	1976-79	1966-79
Poland				
Machine building and metal processing	1.52	1.27	1.45	1.38
Chemicals and rubber	1.62	1.06	0.88	1.20
Construction materials	0.84	0.72	0.27	0.66
Glass, china and ceramics	1.07	1.04	1.84	1.20
Wood and wood processing	0.70	0.93	0.89	0.84
Pulp and paper	0.63	0.59	0.18	0.51
Printing	0.84	0.71	1.51	0.91
Textiles and knitwear	0.84	0.71	0.68	0.74
Clothing	1.07	1.03	0.61	0.95
Leather, furs and footwear	0.77	0.70	0.71	0.72
Food (incl. beverages and tobacco)	0.38	0.79	0.61	0.61
Romania				
Machine building and metal processing	1.32	1.35	1.22	1.30
Chemicals and rubber	1.73	1.17	0.95	1.30
Construction materials	1.09	0.76	1.35	1.02
Glass, china and ceramics	1.02	1.08	0.87	1.01
Wood and wood processing	0.54	0.47	0.60	0.53
Pulp and paper	1.20	0.68	0.71	0.87
Printing	0.59	0.13	0.57	0.40
Textiles and knitwear	0.93	0.91	1.01	0.94
Clothing	1.06	1.29	0.78	1.07
Leather, furs and footwear	0.81	0.68	0.84	0.77
Food (incl. beverages and tobacco)	0.54	0.55	0.68	0.58
Soviet Union				
Machine building and metal processing	1.34	1.49	1.68	1.46
Chemicals and rubber	1.38	1.35	1.10	1.31
Construction materials	0.97	0.92	0.40	0.83
Glass, china and ceramics	1.25	1.39	1.36	1.32
Wood and wood processing	0.59	0.61	0.23	0.52
Pulp and paper	1.01	0.90	0.44	0.85
Printing	n.a.	n.a.	n.a.	n.a.
Textiles and knitwear	0.82	0.61	0.52	0.68
Clothing	1.43	0.59	0.91	1.00
Leather, furs and footwear	0.82	0.44	0.78	0.67
Food (incl. beverages and tobacco)	0.69	0.70	0.37	0.62
Area Average (unweighted)				
Machine building and metal processing	1.34	1.29	1.36	1.32
Chemicals and rubber	1.60	1.28	1.18	1.37
Construction materials	0.90	0.84	0.78	0.85
Glass, china and ceramics	1.16	1.09	1.21	1.14
Wood and wood processing	0.64	0.82	0.73	0.74
Pulp and paper	1.05	0.90	0.65	0.90
Printing	1.03	0.62	1.02	0.76
Textiles and knitwear	0.73	0.75	0.69	0.73
Clothing	1.03	0.83	0.58	0.85
Leather, furs and footwear	0.87	0.72	0.59	0.75
Food (incl. beverages and tobacco)	0.59	0.70	0.58	0.63

1) excluding Soviet Union

Table A.6
Average annual percentage change in employment by branches

	1966-70	1971-75	1976-79	1966-79
Bulgaria				
Total manufacturing	4.2	2.8	0.6	2.7
Machine building and metal processing	6.9	4.9	2.0	4.8
Chemicals and rubber	10.0	4.8	1.4	5.6
Construction materials	0.7	3.7	1.2	1.9
Glass, china and ceramics	4.2	4.0	1.3	3.3
Wood and wood processing	0.9	-0.3	-2.8	-0.6
Pulp and paper	4.8	5.3	4.7	4.9
Printing	5.2	2.7	2.6	3.5
Textiles and knitwear	4.1	2.5	-0.4	2.3
Clothing	4.3	1.7	-1.0	1.8
Leather, furs and footwear	5.4	1.1	-1.8	1.8
Food (incl. beverages and tobacco)	1.1	0.0	-0.3	0.3
Czechoslovakia				
Total manufacturing	1.8	1.2	0.4	1.2
Machine building and metal processing	2,1	1.2	1.0	1.5
Chemicals and rubber	2.9	2.2	0.6	2.0
Construction materials	1.5	0.7	0.5	0.9
Glass, china and ceramics	3.0	1.4	0.0	1.6
Wood and wood processing	1.0	1.3	0.6	1.0
Pulp and paper	4.1	1.9	0.6	2.3
Printing	2.8	0.8	-0.4	1.2
Textiles and knitwear	0.5	1.0	-0.7	0.3
Clothing	1.1	0.4	-1.4	0.1
Leather, furs and footwear	1.8	2.0	-0.7	1.2
Food (incl. beverages and tobacco)	1.3	1.2	0.0	0.9
German Democratic Republic				
Total manufacturing	0.8	3.4	0.8	1.7
Machine building and metal processing	2.3	3.8	1.1	2.5
Chemicals and rubber	0.2	4.0	0.7	1.7
Construction materials	0.6	3.4	0.8	1.7
Glass, china and ceramics	-0.1	5.3	2.2	2.5
Wood and wood processing	-1.1	10.0	0.6	3.3
Pulp and paper	-0.3	5.5	0.6	2.0
Printing	-1.7	0.1	-0.6	-0.8
Textiles and knitwear	-2.9	-0.2	-1.2	-1.4
Clothing	0.0	2.3	-1.4	0.4
Leather, furs and footwear	0 2	3.7	-0.8	1.2
Food (incl. beverages and tobacco)	1.1	1.8	3.4	2.0
Hungary				
Total manufacturing	3.3	0.4	-0.6	1.1
Machine building and metal processing	3.8	0.6	-0.2	1.5
Chemicals and rubber	5.1	1.4	-0.7	2.1
Construction materials	-0.2	-1.1	-0.9	-0.7
Glass, china and ceramics	5.9	2.8	0.1	3.1
Wood and wood processing	-1.3	0.1	-2.1	-1.0
Pulp and paper	6.8	-0.4	-0.3	2.1
Printing	3.3	-0.6	-0.1	0.9
Textiles and knitwear	0.9	-1.9	-2.0	-0.9
Clothing	6.2	1.5	-1.3	2.4
Leather, furs and footwear	4.8	-0.1	-1.6	1.2
Food (incl. beverages and tobacco)	3.3	0.8	0.7	1.6

Table A.6 (continued)
Average annual percentage change in employment by branches

	1966-70	1971-75	1976-79	1966-79
Poland				
Total manufacturing	3.5	2.9	0.0	2.3
Machine building and metal processing	5.2	3.6	1.4	3.5
Chemicals and rubber	3.8	2.7	-0.5	2.2
Construction materials	2.1	0.2	-2.0	0.2
Glass, china and ceramics	3.2	3.3	0.9	2.6
Wood and wood processing	2.4	2.6	-0.7	1.6
Pulp and paper	2.5	1.5	-3.0	0.6
Printing	2.6	2.0	-1.3	1.3
Textiles and knitwear	2.0	1.7	-1.5	0.9
Clothing	3.4	3.9	-0.5	2.5
Leather, furs and footwear	3.5	2.8	-0.5	2.1
Food (incl. beverages and tobacco)	1.9	3.4	-0.5	1.7
Romania				
Total manufacturing	4.7	6.8	3.7	5.1
Machine building and metal processing	6.1	10.8	5.7	7.6
Chemicals and rubber	8.1	7.4	4.0	6.7
Construction materials	3.6	2.1	2.2	2.7
Glass, china and ceramics	4.5	8.3	5.8	6.2
Wood and wood processing	1.6	1.4	0.0	1.1
Pulp and paper	3.2	4.0	1.5	3.0
Printing	-0.5	-1.1	0.0	-0.6
Textiles and knitwear	5.0	7.3	4.0	5.5
Clothing	7.5	8.6	2.2	6.3
Leather, furs and footwear	5.6	4.0	2.8	4.2
Food (incl. beverages and tobacco)	3.0	4.1	1.7	3.0
Soviet Union				
Total manufacturing	3.1	1.6	1.3	2.0 [1]
Machine building and metal processing	3.9	2.8	2.0	3.0 [1]
Chemicals and rubber	4.3	2.5	1.4	2.8 [1]
Construction materials	3.0	1.4	0.1	1.6 [1]
Glass, china and ceramics	1.6	2.8	2.4	2.3 [1]
Wood and wood processing	-0.0	-0.5	-0.5	-0.3 [1]
Pulp and paper	4.1	0.8	1.1	2.0 [1]
Printing	n.a.	n.a.	n.a.	n.a. [1]
Textiles and knitwear	1.6	0.3	0.3	0.8 [1]
Clothing	4.9	0.5	3.2	2.8 [1]
Leather, furs and footwear	2.6	0.2	0.2	1.1 [1]
Food (incl. beverages and tobacco)	2.3	0.8	-1.5	0.7 [1]
Area Average (unweighted)				
Total manufacturing	3.1	2.7	0.9	1.9
Machine building and metal processing	4.4	4.0	1.8	3.5
Chemicals and rubber	4.9	3.6	1.9	3.3
Construction materials	1.6	1.5	0.3	1.2
Glass, china and ceramics	3.2	4.0	1.8	3.1
Wood and wood processing	0.5	2.1	-0.7	0.7
Pulp and paper [2]	3.6	2.7	0.7	2.4
Printing [2]	2.0	0.7	0.0	0.2
Textiles and knitwear	1.6	1.5	-0.2	1.0
Clothing	3.9	2.7	-0.0	2.3
Leather, furs and footwear	3.4	2.0	-0.4	1.8
Food (incl. beverages and tobacco)	2.0	1.7	0.5	1.5

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1) Calculated, using indices of gross production and labour productivity
2) Excluding Soviet Union

Table A.7

Average annual percentage change in investment by branches

	1966-70	1971-75	1976-79	1966-79
Bulgaria				
Total manufacturing	21.4	7.1	1.7	10.4
Machine building and metal processing	23.9	6.2	9.5	13.2
Chemicals and rubber	26.2	2.0	5.2	11.0
Construction materials	13.4	22.1	8.4	14.9
Glass, china and ceramics	6.3	16.6	-19.8	1.4
Wood and wood processing	17.2	4.8	-9.5	4.6
Pulp and paper	19.1	-4.1	-4.7	4.6
Printing	47.6	0.0	3.4	16.0
Textiles and knitwear	20.9	5.9	-18.4	3.1
Clothing	27.2	22.0	-28.6	6.2
Leather, furs and footwear	22.9	2.7	-15.9	3.4
Food (incl. beverages and tobacco)	17.3	10.1	-7.3	7.2
Czechoslovakia				
Total manufacturing	11.0	5.9	1.5	6.4
Machine building and metal processing	7.8	10.4	5.2	8.0
Chemicals and rubber	7.1	1.0	-6.4	0.9
Construction materials	19.2	5.7	-3.7	7.5
Glass, china and ceramics	3.3	3.5	1.8	3.0
Wood and wood processing	19.6	7.8	0.2	9.6
Pulp and paper	17.8	-0.2	14.8	10.2
Printing	25.0	8.7	-15.2	6.4
Textiles and knitwear	18.0	-1.1	0.7	5.9
Clothing	13.9	-5.2	14.8	6.9
Leather, furs and footwear	18.9	12.2	-3.7	9.6
Food (incl. beverages and tobacco)	10.0	8.3	0.8	6.7
German Democratic Republic				
Total manufacturing	15.6	2.0	5.5	7.7
Machine building and metal processing	18.2	0.0	7.0	8.2
Chemicals and rubber	9.9	3.2	7.2	6.7
Construction materials	21.6	-1.3	1.5	7.2
Textiles and knitwear	15.6	4.3	0.8	7.2
Food (incl. beverages and tobacco)	14.2	8.6	2.2	8.7
Hungary				
Total manufacturing	10.8	7.8	4.7	7.9
Machine building and metal processing	11.9	3.1	10.3	8.2
Chemicals and rubber	4.5	12.7	-4.2	4.7
Construction materials	30.2	3.7	4.6	12.8
Glass, china and ceramics	14.7	2.0	13.5	9.7
Wood and wood processing	-0.7	13.0	-1.2	3.8
Pulp and paper	10.6	4.0	-22.1	-2.1
Printing	36.5	14.6	2.6	18.2
Textiles and knitwear	2.5	11.4	-0.4	4.7
Clothing	18.8	17.7	-1.4	12.3
Leather, furs and footwear	9.3	10.6	-3.8	5.8
Food (incl. beverages and tobacco)	13.5	10.1	11.7	11.8

Table A.7 (continued)

Average annual percentage change in investment by branches

	1966-70	1971-75	1976-79	1966-79
Poland				
Total manufacturing	9.4	23.3	-4.9	9.7
Machine building and metal processing	11.5	26.8	-3.4	12.0
Chemicals and rubber	6.5	15.4	2.9	8.5
Construction materials	12.5	20.6	-20.6	4.4
Glass, china and ceramics	9.3	4.8	18.5	10.2
Wood and wood processing	14.9	36.7	-17.9	11.1
Pulp and paper	-0.2	15.8	12.7	8.9
Printing	-0.6	36.4	-28.4	1.3
Textiles and knitwear	14.1	23.0	-16.3	7.3
Clothing	15.4	22.0	-4.8	11.4
Leather, furs and footwear	26.7	11.2	-11.2	9.2
Food (incl. beverages and tobacco)	5.9	27.9	-5.3	9.7
Romania				
Total manufacturing	17.2	12.1	14.2	14.5
Machine building and metal processing	37.2	12.0	20.0	22.8
Chemicals and rubber	9.3	18.3	16.0	14.4
Construction materials	20.2	7.2	10.9	12.8
Glass, china and ceramics	64.4	-17.3	34.0	21.3
Wood and wood processing	4.5	6.0	-0.3	3.6
Pulp and paper	-14.1	13.0	7.4	1.0
Printing	21.5	5.9	-11.4	5.7
Textiles and knitwear	20.6	11.5	9.6	14.1
Clothing	17.8	13.4	-4.2	9.5
Leather, furs and footwear	8.0	14.9	3.0	8.9
Food (incl. beverages and tobacco)	20.0	13.2	2.5	12.3
Soviet Union				
Total manufacturing	8.5	7.2	3.1	6.5
Machine building and metal processing	13.6	9.6	4.0	9.4
Chemicals and rubber	2.5	9.6	4.0	5.4
Construction materials	11.5	1.4	1.4	4.9
Glass, china and ceramics	14.4	4.0	-7.9	3.9
Wood and wood processing	7.9	2.5	0.8	3.9
Pulp and paper	-5.0	10.1	2.0	2.2
Printing	16.4	7.3	7.2	10.4
Textiles and knitwear	5.7	5.6	4.1	5.2
Clothing	19.3	3.1	-0.4	7.6
Leather, furs and footwear	17.2	5.7	-3.9	6.7
Food (incl. beverages and tobacco)	5.2	4.6	1.8	4.0
Area Average (unweighted) [1)]				
Total manufacturing	14.2	9.7	3.8	9.4
Machine building and metal processing	17.7	9.7	7.5	11.7
Chemicals and rubber	9.4	8.9	3.5	7.4
Construction materials	18.4	8.5	0.4	9.2
Glass, china and ceramics [1)]	18.7	2.3	6.7	8.2
Wood and wood processing [1)]	10.6	11.8	-4.7	6.1
Pulp and paper [1)]	4.7	6.9	1.7	4.1
Printing [1)]	24.4	12.2	-7.0	9.7
Textiles and knitwear	13.9	8.7	-2.8	6.8
Clothing [1)]	18.7	12.2	-4.1	9.0
Leather, furs and footwear [1)]	17.2	9.5	-5.9	7.3
Food (incl. beverages and tobacco)	12.3	11.8	0.9	8.6

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1) not including GDR

A P P E N D I X B

Basic Statistical Tables
to Part I, Chapter 2

Table B.1

Levels of relative labour productivity
(Total manufacturing = 100)

	1965	1970	1975	1979
Bulgaria				
Machine building and metal processing	76	83	95	101
Chemicals and rubber	108	132	133	141
Construction materials	72	85	81	83
Glass, china and ceramics	43	49	44	43
Wood and wood processing	52	47	46	42
Pulp and paper	78	95	94	71
Printing	57	58	45	51
Textiles and knitwear	93	86	79	78
Clothing	75	86	83	74
Leather, furs and footwear	68	68	65	58
Food (incl. beverages and tobacco)	194	183	178	166
Czechoslovakia				
Machine building and metal processing	80	88	93	97
Chemicals and rubber	152	165	179	181
Construction materials	98	98	98	93
Glass, china and ceramics	58	56	55	56
Wood and wood processing	86	81	78	78
Pulp and paper	151	125	119	114
Printing	55	64	57	56
Textiles and knitwear	72	69	66	64
Clothing	51	49	47	46
Leather, furs and footwear	77	72	65	63
Food (incl. beverages and tobacco)	254	226	202	186
German Democratic Republic				
Machine building and metal processing	80	80	80	84
Chemicals and rubber	121	129	137	139
Construction materials	75	74	76	71
Glass, china and ceramics	58	60	57	55
Wood and wood processing	99	111	82	83
Pulp and paper	120	123	105	104
Printing	61	62	67	63
Textiles and knitwear	64	71	80	83
Clothing	59	58	55	56
Leather, furs and footwear	69	71	69	72
Food (incl. beverages and tobacco)	286	254	263	218
Hungary				
Machine building and metal processing	95	98	100	100
Chemicals and rubber	137	166	181	213
Construction materials	71	74	68	66
Glass, china and ceramics	55	56	53	54
Wood and wood processing	72	76	81	85
Pulp and paper	88	85	90	88
Printing	68	77	84	84
Textiles and knitwear	73	66	64	60
Clothing	81	67	57	50
Leather, furs and footwear	61	52	49	43
Food (incl. beverages and tobacco)	171	157	141	127

Table B.1 continued

Levels of relative labour productivity
(Total manufacturing = 100)

	1965	1970	1975	1979
Poland				
Machine building and metal processing	80	89	99	104
Chemicals and rubber	110	136	142	141
Construction materials	72	72	71	65
Glass, china and ceramics	45	47	47	55
Wood and wood processing	89	84	83	83
Pulp and paper	120	110	95	88
Printing	38	37	34	40
Textiles and knitwear	79	81	74	73
Clothing	79	82	79	74
Leather, furs and footwear	78	72	62	59
Food (incl. beverages and tobacco)	207	176	155	144
Romania				
Machine building and metal processing	94	104	106	107
Chemicals and rubber	139	171	184	178
Construction materials	62	69	74	90
Glass, china and ceramics	39	39	39	34
Wood and wood processing	56	50	47	46
Pulp and paper	92	109	103	100
Printing	32	32	28	27
Textiles and knitwear	77	73	68	67
Clothing	88	80	87	84
Leather, furs and footwear	65	56	53	51
Food (incl. beverages and tobacco)	263	222	192	182
Soviet Union				
Machine building and metal processing	61	67	75	83
Chemicals and rubber	128	140	152	154
Construction materials	71	70	69	64
Glass, china and ceramics	40	47	51	53
Wood and wood processing	59	58	56	52
Pulp and paper	113	108	109	98
Printing	45	51	36	50
Textiles and knitwear	165	165	154	145
Clothing	72	78	71	65
Leather, furs and footwear	98	93	82	82
Food (incl. beverages and tobacco)	277	254	238	234
Area average (unweighted)				
Machine building and metal processing	81	87	93	97
Chemicals and rubber	128	148	158	164
Construction materials	74	77	77	76
Glass, china and ceramics	48	51	49	50
Wood and wood processing	73	72	68	68
Pulp and paper	109	108	102	95
Printing	51	55	50	53
Textiles and knitwear	89	87	83	81
Clothing	72	71	68	64
Leather, furs and footwear	74	69	64	61
Food (incl. beverages and tobacco)	230	210	195	179

Table B.2

Average annual percentage change of labour productivity by branches

	1966-70	1971-75	1976-79	1966-79
Bulgaria				
Total manufacturing	6.0	6.4	6.2	6.1
Machine building and metal processing	7.9	9.1	7.9	8.3
Chemicals and rubber	10.3	6.6	7.8	8.2
Construction materials	9.6	5.3	6.8	7.3
Glass, china and ceramics	8.6	4.3	5.6	6.2
Wood and wood processing	3.9	6.2	5.6	5.2
Pulp and paper	10.1	6.3	-0.9	5.5
Printing	6.4	1.1	9.6	5.4
Textiles and knitwear	4.4	4.6	5.8	4.9
Clothing	8.8	5.8	3.1	6.1
Leather, furs and footwear	6.1	5.5	3.0	5.0
Food (incl. beverages and tobacco)	4.7	5.9	4.3	5.0
Czechoslovakia				
Total manufacturing	5.2	5.9	5.1	5.4
Machine building and metal processing	7.0	7.1	6.1	6.8
Chemicals and rubber	6.9	7.6	5.4	6.7
Construction materials	5.2	5.9	3.9	5.1
Glass, china and ceramics	4.5	5.2	5.6	5.1
Wood and wood processing	4.0	5.1	5.2	4.8
Pulp and paper	1.2	5.0	3.9	3.3
Printing	8.5	3.5	4.4	5.5
Textiles and knitwear	4.3	4.8	4.3	4.5
Clothing	4.2	4.8	4.9	4.6
Leather, furs and footwear	3.7	3.9	4.1	3.9
Food (incl. beverages and tobacco)	2.8	3.5	3.0	3.1
German Democratic Republic				
Total manufacturing	5.4	2.9	4.2	4.1
Machine building and metal processing	5.6	2.8	5.6	4.6
Chemicals and rubber	6.6	4.3	4.6	5.2
Construction materials	5.0	3.4	2.2	3.7
Glass, china and ceramics	6.1	1.7	3.4	3.7
Wood and wood processing	7.7	-3.1	4.5	2.8
Pulp and paper	5.9	-0.4	4.0	3.1
Printing	5.6	4.6	2.6	4.4
Textiles and knitwear	7.4	5.4	5.1	6.0
Clothing	4.8	2.1	4.5	3.7
Leather, furs and footwear	6.0	2.2	5.6	4.5
Food (incl. beverages and tobacco)	2.9	3.6	-0.6	2.1
Hungary				
Total manufacturing	3.2	6.6	5.8	5.1
Machine building and metal processing	3.7	7.2	5.8	5.5
Chemicals and rubber	7.2	8.5	10.3	8.5
Construction materials	4.0	4.7	5.1	4.5
Glass, china and ceramics	3.5	5.5	6.3	5.0
Wood and wood processing	4.2	8.1	6.9	6.3
Pulp and paper	2.4	7.8	5.4	5.2
Printing	5.8	8.5	5.9	6.8
Textiles and knitwear	1.0	6.0	4.0	3.7
Clothing	-0.8	3.3	2.3	1.5
Leather, furs and footwear	-0.0	5.4	2.0	2.5
Food (incl. beverages and tobacco)	1.5	4.3	3.0	2.9

Table B.2 (continued)

Average annual percentage change of labour productivity by branches

	1966-70	1971-75	1976-79	1966-79
Poland				
Total manufacturing	4.4	8.7	6.1	6.3
Machine building and metal processing	6.7	10.4	7.4	8.2
Chemicals and rubber	8.9	9.0	5.9	8.1
Construction materials	4.6	7.9	3.7	5.5
Glass, china and ceramics	5.3	8.2	10.2	7.7
Wood and wood processing	3.1	7.8	6.2	5.6
Pulp and paper	2.5	5.1	4.2	3.9
Printing	4.0	5.9	10.6	6.5
Textiles and knitwear	4.7	6.2	5.8	5.5
Clothing	5.1	7.4	4.2	5.6
Leather, furs and footwear	2.7	4.9	4.9	4.1
Food (incl. beverages and tobacco)	1.1	5.3	4.2	3.5
Romania				
Total manufacturing	7.0	6.2	6.9	6.8
Machine building and metal processing	9.1	6.6	7.2	7.7
Chemicals and rubber	11.7	7.7	6.1	8.6
Construction materials	9.1	7.9	12.3	9.6
Glass, china and ceramics	7.5	5.7	3.5	5.7
Wood and wood processing	4.8	4.9	6.5	5.3
Pulp and paper	10.9	5.0	6.1	7.4
Printing	7.6	2.8	6.3	5.5
Textiles and knitwear	5.9	4.6	6.7	5.7
Clothing	4.9	8.0	6.2	6.4
Leather, furs and footwear	3.9	4.9	6.2	4.9
Food (incl. beverages and tobacco)	3.4	3.2	5.6	4.0
Soviet Union				
Total manufacturing	5.3	6.0	3.8	5.2
Machine building and metal processing	7.3	8.5	6.5	7.5
Chemicals and rubber	7.2	7.7	4.2	6.5
Construction materials	5.2	5.6	2.0	4.4
Glass, china and ceramics	9.0	7.7	4.4	7.2
Wood and wood processing	5.1	5.3	1.7	4.2
Pulp and paper	4.4	6.2	1.1	4.1
Printing	n.a.	n.a.	n.a.	n.a.
Textiles and knitwear	5.4	4.5	2.3	4.2
Clothing	7.0	4.0	1.4	4.3
Leather, furs and footwear	4.4	3.2	3.8	3.8
Food (incl. beverages and tobacco)	3.5	4.6	3.4	3.9
Area Average (unweighted)				
Total manufacturing	5.2	6.1	5.4	5.6
Machine building and metal processing	6.8	7.4	6.6	6.9
Chemicals and rubber	8.4	7.3	6.3	7.4
Construction materials	6.1	5.8	5.1	5.7
Glass, china and ceramics	6.4	5.5	5.6	5.8
Wood and wood processing	4.7	4.9	5.3	4.9
Pulp and paper	5.4	5.0	3.4	4.6
Printing[1)]	6.3	4.4	6.6	5.9
Textiles and knitwear	4.7	5.2	4.9	4.9
Clothing	4.9	5.1	3.8	4.6
Leather, furs and footwear	3.8	4.3	4.2	4.1
Food (incl. beverages and tobacco)	2.8	4.3	3.3	3.5

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1) Excluding Soviet Union

Table B.3
Average annual percentage change of incremental gross investment-output ratio by branches

	1966-70	1971-75	1976-79	1966-79
Bulgaria				
Total manufacturing	9.9	-2.1	-4.8	1.3
Machine building and metal processing	7.4	-7.3	-0.5	-0.3
Chemicals and rubber	4.0	-8.7	-3.7	-2.9
Construction materials	2.8	11.8	0.2	5.2
Glass, china and ceramics	-6.0	7.5	-25.0	-7.6
Wood and wood processing	11.8	-1.0	-11.9	0.0
Pulp and paper	3.3	-11.7	-8.2	-5.6
Printing	31.9	-3.7	-8.0	6.3
Textiles and knitwear	11.3	-1.3	-22.5	-3.9
Clothing	12.1	13.4	-30.1	-1.6
Leather, furs and footwear	9.8	-3.7	-16.8	-3.2
Food (incl. beverages and tobacco)	10.8	4.0	-10.8	1.8
Czechoslovakia				
Total manufacturing	3.6	-1.2	-3.8	-0.3
Machine building and metal processing	-1.4	1.8	-1.9	-0.4
Chemicals and rubber	-2.6	-8.9	-11.7	-7.3
Construction materials	11.7	-0.9	-7.7	1.3
Glass, china and ceramics	-4.1	-8.9	-3.6	-3.5
Wood and wood processing	13.8	1.2	-5.3	3.6
Pulp and paper	11.8	-6.7	9.9	4.3
Printing	12.1	4.2	-18.5	-0.3
Textiles and knitwear	12.5	-6.6	-2.8	1.0
Clothing	8.1	-9.9	10.9	2.0
Leather, furs and footwear	12.6	5.8	-6.8	4.3
Food (incl. beverages and tobacco)	5.7	3.4	-2.2	2.6
German Democratic Republic				
Total of five branches	8.8	-4.2	0.4	1.6
Machine building and metal processing	9.4	-6.2	0.2	1.0
Chemicals and rubber	2.9	-4.8	1.9	-0.2
Construction materials	15.1	-7.7	-1.6	1.7
Textiles and knitwear	10.9	-0.8	-2.9	2.6
Food (incl. beverages and tobacco)	9.7	3.1	-0.6	4.3
Hungary				
Total manufacturing	3.9	0.7	-0.5	1.5
Machine building and metal processing	3.9	-4.4	4.5	1.0
Chemicals and rubber	-7.2	2.5	-12.5	-5.5
Construction materials	25.4	0.1	0.5	8.6
Glass, china and ceramics	4.6	-5.9	6.7	1.3
Wood and wood processing	-3.4	4.5	-5.7	-1.3
Pulp and paper	1.1	-3.2	-25.8	-8.9
Printing	24.9	6.3	-3.0	9.7
Textiles and knitwear	0.6	7.1	-2.3	2.0
Clothing	12.7	12.2	-2.3	8.0
Leather, furs and footwear	4.3	5.1	-4.2	2.1
Food (incl. beverages and tobacco)	8.2	4.8	7.7	6.9

Table B.3 (continued)
Average annual percentage change of incremental gross investment-output ratio by branches

	1966-70	1971-75	1976-79	1966-79
Poland				
Total manufacturing	1.2	10.8	-10.4	0.9
Machine building and metal processing	0.7	10.8	-11.3	0.0
Chemicals and rubber	-5.8	3.0	-2.4	-1.7
Construction materials	5.3	11.5	-21.8	-1.3
Glass, china and ceramics	0.6	-6.2	6.5	0.3
Wood and wood processing	8.8	23.7	-22.1	3.5
Pulp and paper	-5.1	8.5	11.5	4.3
Printing	-7.0	26.2	-34.4	-6.1
Textiles and knitwear	6.9	13.8	-19.6	0.8
Clothing	6.2	9.3	-8.2	2.9
Leather, furs and footwear	19.3	3.1	-14.9	2.8
Food (incl. beverages and tobacco)	2.8	17.5	-8.7	4.2
Romania				
Total manufacturing	4.6	-1.1	3.0	2.0
Machine building and metal processing	18.5	-5.1	5.9	6.0
Chemicals and rubber	-9.4	2.3	5.1	-1.3
Construction materials	6.2	-2.6	-3.4	0.2
Glass, china and ceramics	46.4	-27.8	22.4	8.1
Wood and wood processing	-1.9	-0.3	-6.4	-2.7
Pulp and Paper	-24.9	3.5	-0.3	-8.7
Printing	13.4	4.1	-16.6	0.8
Textiles and knitwear	8.5	-0.6	-1.2	2.4
Clothing	4.5	- 3.3	-11.7	-3.1
Leather, furs and footwear	-1.6	5.2	-5.6	-0.4
Food (incl. beverages and tobacco)	12.7	5.3	-4.5	4.9
Soviet Union				
Total manufacturing	-0.1	-0.5	-1.9	-0.7
Machine building and metal processing	1.9	-1.7	-4.2	-1.2
Chemicals and rubber	-8.4	-0.7	-1.5	-3.8
Construction materials	2.9	-5.3	-0.6	-1.1
Glass, china and ceramics	3.3	-6.1	-13.9	-5.2
Wood and wood processing	2.6	-2.1	-0.3	0.1
Pulp and paper	-12.6	2.9	-0.2	-3.8
Printing	n.a.	n.a.	n.a.	n.a.
Textiles and knitwear	-1.3	0.9	1.4	0.2
Clothing	6.3	-1.4	-4.8	0.3
Leather, furs and footwear	9.4	2.3	-7.6	1.8
Food (incl. beverages and tobacco)	-0.7	-0.7	-0.0	-0.5
Area Average (unweighted)				
Total manufacturing	4.6	0.4	-2.6	0.9
Machine building and metal processing	5.5	-1.7	-1.1	0.9
Chemicals and rubber	-3.8	-2.1	-3.5	-3.2
Construction materials	10.0	1.0	-4.9	2.1
Glass, china and ceramic[1)]	7.5	-6.9	-1.2	-1.2
Wood and wood processing[1)]	5.3	4.3	-8.6	0.5
Pulp and paper[1)]	-4.4	-1.1	-2.2	-3.1
Printing[2)]	15.1	5.3	-13.0	2.3
Textiles and knitwear	7.0	1.8	7.1	0.7
Clothing[1)]	8.3	3.4	-7.7	1.4
Leather, furs and footwear[1)]	9.0	3.0	-9.3	1.2
Food (incl. beverages and tobacco)	7.0	5.3	-2.7	3.4

1) excluding GDR
2) excluding GDR and Soviet Union

Table B.4

Levels of relative investment intensity
(Total manufacturing = 100)

	1965	1970	1975	1979
Bulgaria				
Machine building and metal processing	103	101	87	110
Chemicals and rubber	370	343	243	270
Construction materials	125	106	195	245
Glass, china and ceramics	152	73	113	43
Wood and wood processing	53	52	55	39
Pulp and paper	292	259	154	101
Printing	49	124	89	87
Textiles and knitwear	67	66	64	27
Clothing	11	14	27	07
Leather, furs and footwear	38	38	34	17
Food (incl. beverages and tobacco)	88	87	114	82
Czechoslovakia				
Machine building and metal processing	74	63	77	87
Chemicals and rubber	443	352	265	190
Construction materials	149	216	220	173
Glass, china and ceramics	114	75	67	69
Wood and wood processing	60	91	99	94
Pulp and paper	228	276	199	324
Printing	62	107	125	63
Textiles and knitwear	69	100	72	73
Clothing	18	21	13	22
Leather, furs and footwear	27	38	48	41
Food (incl. beverages and tobacco)	126	124	139	137
German Democratic Republic				
Machine building and metal processing	79	83	73	77
Chemicals and rubber	244	198	199	216
Construction materials	176	237	193	164
Textiles and knitwear	41	49	65	60
Food (incl. beverages and tobacco)	97	91	132	107
Hungary				
Machine building and metal processing	78	79	63	76
Chemicals and rubber	353	241	287	202
Construction materials	89	235	209	211
Glass, china and ceramics	124	129	87	118
Wood and wood processing	50	36	47	39
Pulp and paper	497	416	362	110
Printing	40	114	162	147
Textiles and knitwear	74	57	75	65
Clothing	11	13	19	15
Leather, furs and footwear	36	31	36	27
Food (incl. beverages and tobacco)	114	129	140	173

Table B.4 (continued)

Levels of relative investment intensity
(Total manufacturing = 100)

	1965	1970	1975	1979
Poland				
Machine building and metal processing	88	89	99	100
Chemicals and rubber	292	252	183	256
Construction materials	151	186	190	100
Glass, china and ceramics	95	96	42	97
Wood and wood processing	37	49	84	48
Pulp and paper	291	192	150	336
Printing	83	54	93	31
Textiles and knitwear	47	62	65	42
Clothing	12	16	14	15
Leather, furs and footwear	18	38	23	18
Food (incl. beverages and tobacco)	108	100	117	117
Romania				
Machine building and metal processing	56	114	95	107
Chemicals and rubber	444	267	339	357
Construction materials	135	160	160	151
Glass, china and ceramics	37	205	42	73
Wood and wood processing	74	48	47	31
Pulp and paper	736	167	199	169
Printing	23	36	39	16
Textiles and knitwear	45	52	49	41
Clothing	16	14	14	7
Leather, furs and footwear	24	15	20	14
Food (incl. beverages and tobacco)	91	111	132	92
Soviet Union				
Machine building and metal processing	73	89	93	94
Chemicals and rubber	375	266	285	293
Construction materials	130	150	115	113
Glass, china and ceramics	63	88	71	43
Wood and wood processing	63	71	63	62
Pulp and paper	469	230	274	263
Printing	52	90	109	78
Textiles and knitwear	66	62	62	66
Clothing	7	10	9	7
Leather, furs and footwear	26	39	39	31
Food (incl. beverages and tobacco)	160	142	131	139
Area Average (unweighted)				
Machine building and metal processing	79	88	84	93
Chemicals and rubber	361	274	257	255
Construction materials	137	185	183	166
Glass, china and ceramics	97	112	70	74
Wood and wood processing	56	58	66	52
Pulp and paper	419	257	223	217
Printing	52	87	103	71
Textiles and knitwear	59	70	74	60
Clothing	12	15	16	12
Leather, furs and footwear	28	33	33	25
Food (incl. beverages and tobacco)	112	112	129	122

Table B.5
Average annual percentage change of gross investment per employee

	1966-70	1971-75	1976-79	1966-79
Bulgaria				
Total manufacturing	16.5	4.2	6.5	7.5
Machine building and metal processing	15.9	1.2	7.3	8.0
Chemicals and rubber	14.7	-2.7	3.8	5.1
Construction materials	12.7	17.7	7.1	12.8
Glass, china and ceramics	2.0	12.1	-20.8	-1.8
Wood and wood processing	16.1	5.1	-6.9	5.2
Pulp and paper	13.7	-6.2	-9.0	-0.4
Printing	40.3	-2.7	0.8	12.0
Textiles and knitwear	16.1	3.3	-18.1	0.8
Clothing	22.0	20.0	-27.9	4.3
Leather, furs and footwear	16.5	1.6	-14.3	1.6
Food (incl. beverages and tobacco)	16.0	10.1	-7.0	6.9
Czechoslovakia				
Total manufacturing	9.0	4.6	1.1	5.1
Machine building and metal processing	5.5	9.1	4.1	6.4
Chemicals and rubber	4.1	-1.2	-7.0	-1.1
Construction materials	17.5	4.9	-4.1	6.5
Glass, china and ceramics	0.3	2.1	1.8	1.4
Wood and wood processing	18.4	6.4	-0.4	8.5
Pulp and paper	13.2	-2.1	14.2	7.8
Printing	21.6	7.8	-14.9	5.2
Textiles and knitwear	17.4	-2.1	1.4	5.5
Clothing	12.6	-5.5	16.3	6.8
Leather, furs and footwear	16.8	9.9	-3.0	3.4
Food (incl. beverages and tobacco)	8.6	7.0	0.8	5.8
German Democratic Republic				
Total of five branches	14.4	-1.0	4.4	5.8
Machine building and metal processing	15.5	-3.6	5.8	5.6
Chemicals and rubber	9.7	-0.8	6.5	5.0
Construction materials	20.9	-4.6	0.6	5.4
Textiles and knitwear	19.1	4.5	2.0	8.8
Food (incl. beverages and tobacco)	12.9	6.8	-1.2	6.5
Hungary				
Total manufacturing	7.3	7.4	5.3	6.7
Machine building and metal processing	7.7	2.5	10.5	6.6
Chemicals and rubber	-0.6	11.2	-3.5	2.6
Construction materials	30.5	4.8	5.6	13.6
Glass, china and ceramics	8.3	-0.7	13.4	6.4
Wood and wood processing	0.6	12.9	0.9	4.9
Pulp and paper	3.6	4.4	-21.8	-4.2
Printing	32.1	15.3	2.8	17.1
Textiles and knitwear	1.6	13.5	1.6	5.7
Clothing	11.8	15.9	0.1	9.7
Leather, furs and footwear	4.3	10.7	-2.2	4.6
Food (incl. beverages and tobacco)	9.9	9.3	11.0	10.0

Table B.5 (continued)
Average annual percentage change of gross investment per employee

	1966-70	1971-75	1976-79	1966-79
Poland				
Total manufacturing	5.7	19.8	-4.9	7.2
Machine building and metal processing	6.0	22.3	-4.7	8.2
Chemicals and rubber	2.6	12.3	3.4	6.2
Construction materials	10.2	20.3	-18.9	4.2
Glass, china and ceramics	6.0	1.5	17.4	7.4
Wood and wood processing	12.2	33.3	-17.3	9.4
Pulp and paper	-2.7	14.0	16.2	8.3
Printing	-3.2	33.7	-27.4	0.0
Textiles and knitwear	11.9	20.9	-15.0	6.3
Clothing	11.7	17.4	-4.4	8.7
Leather, furs and footwear	22.5	8.2	-10.8	7.0
Food (incl. beverages and tobacco)	3.9	23.7	-4.9	7.8
Romania				
Total manufacturing	11.9	5.0	10.1	8.9
Machine building and metal processing	29.3	1.1	13.5	14.1
Chemicals and rubber	1.1	10.1	11.6	7.2
Construction materials	15.9	5.0	8.5	9.8
Glass, china and ceramics	57.4	-23.7	26.6	14.2
Wood and wood processing	2.8	4.5	-0.3	2.5
Pulp and Paper	-16.7	8.6	5.8	-2.0
Printing	22.1	7.1	-11.4	6.3
Textiles and knitwear	14.9	4.0	5.4	8.1
Clothing	9.6	4.4	-6.2	3.0
Leather, furs and footwear	2.3	10.4	0.2	4.5
Food (incl. beverages and tobacco)	16.5	8.7	0.8	9.1
Soviet Union				
Total manufacturing	5.2	5.5	1.8	4.4
Machine building and metal processing	9.3	6.6	2.0	6.2
Chemicals and rubber	-1.8	7.0	2.6	2.5
Construction materials	8.3	0.0	1.4	3.3
Glass, china and ceramics	12.6	1.2	-10.1	1.6
Wood and wood processing	7.9	3.1	1.4	4.3
Pulp and paper	-8.8	9.2	0.9	0.1
Printing	n.a.	n.a.	n.a.	n.a.
Textiles and knitwear	4.0	5.4	3.8	4.4
Clothing	13.7	2.6	-3.4	4.6
Leather, furs and footwear	14.2	5.5	-4.1	5.6
Food (incl. beverages and tobacco)	2.8	3.8	3.4	3.3
Area Average (unweighted)				
Total manufacturing	9.7	6.5	3.5	6.5
Machine building and metal processing	12.8	5.6	5.5	7.9
Chemicals and rubber	4.3	5.1	2.5	4.0
Construction materials	16.5	6.9	0.0	7.9
Glass, china and ceramics[1)]	14.4	-1.2	4.7	4.9
Wood and wood processing[1)]	9.7	10.9	-3.8	5.8
Pulp and paper[1)]	0.4	4.7	1.0	1.6
Printing[2)]	22.6	12.2	-10.0	8.1
Textiles and knitwear[1)]	11.3	7.4	-2.7	5.7
Clothing[1)]	13.6	9.1	-4.3	6.2
Leather, furs and footwear[1)]	12.7	7.7	-5.7	5.3
Food (incl. beverages and tobacco)	10.1	9.9	0.5	7.0

1) excluding GDR
2) excluding GDR and Soviet Union

Table B.6
Proportion of output growth accounted for by the growth of labour productivity
(in percentages)

	1966-70	1971-75	1976-79	1966-79
Bulgaria				
Total manufacturing	57	68	91	68
Machine building and metal processing	51	63	78	62
Chemicals and rubber	48	56	84	57
Construction materials	93	58	84	78
Glass, china and ceramics	65	51	80	64
Wood and wood processing	81	105	208	113
Pulp and paper	66	53	-24	51
Printing	54	29	77	59
Textiles and knitwear	50	63	108	67
Clothing	65	77	153	76
Leather, furs and footwear	52	83	276	73
Food (incl. beverages and tobacco)	80	100	109	94
Czechoslovakia				
Total manufacturing	73	82	93	81
Machine building and metal processing	75	84	85	81
Chemicals and rubber	69	76	90	76
Construction materials	77	89	89	84
Glass, china and ceramics	59	78	99	75
Wood and wood processing	79	79	89	82
Pulp and paper	23	72	87	59
Printing	74	81	110	82
Textiles and knitwear	90	82	119	93
Clothing	78	93	141	97
Leather, furs and footwear	66	65	121	76
Food (incl. beverages and tobacco)	68	74	100	78
German Democratic Republic				
Total manufacturing	87	45	84	69
Machine building and metal processing	70	42	83	64
Chemicals and rubber	97	50	87	75
Construction materials	89	49	73	68
Glass, china and ceramics	102	24	60	59
Wood and wood processing	118	-46	88	46
Pulp and paper	105	-8	87	60
Printing	148	98	134	122
Textiles and knitwear	172	103	132	134
Clothing	100	47	146	90
Leather, furs and footwear	96	36	118	79
Food (incl. beverages and tobacco)	71	66	-22	51
Hungary				
Total manufacturing	48	94	112	81
Machine building and metal processing	48	92	104	78
Chemicals and rubber	57	85	109	79
Construction materials	105	133	122	120
Glass, china and ceramics	37	65	99	61
Wood and wood processing	149	99	147	121
Pulp and paper	26	105	106	70
Printing	62	108	102	87
Textiles and knitwear	55	149	203	136
Clothing	-15	68	232	39
Leather, furs and footwear	0	103	528	67
Food (incl. beverages and tobacco)	31	84	82	64

Table B.6 (continued)
Proportion of output accounted for by the growth of labour productivity
(in percentages)

	1966-70	1971-75	1976-79	1966-79
Poland				
Total manufacturing	54	77	100	72
Machine building and metal processing	55	72	83	68
Chemicals and rubber	68	75	109	77
Construction materials	68	97	225	96
Glass, china and ceramics	62	70	91	74
Wood and wood processing	55	74	114	77
Pulp and paper	49	76	391	87
Printing	59	73	115	83
Textiles and knitwear	69	77	139	86
Clothing	59	64	114	68
Leather, furs and footwear	43	63	112	65
Food (incl. beverages and tobacco)	36	60	114	66
Romania				
Total manufacturing	58	46	63	56
Machine building and metal processing	58	36	54	48
Chemicals and rubber	56	49	59	54
Construction materials	70	77	83	76
Glass, china and ceramics	61	39	37	46
Wood and wood processing	73	77	100	82
Pulp and Paper	75	55	79	70
Printing	107	104	100	112
Textiles and knitwear	53	38	61	49
Clothing	38	46	73	49
Leather, furs and footwear	40	54	68	53
Food (incl. beverages and tobacco)	53	43	76	56
Soviet Union				
Total manufacturing	62	78	75	71
Machine building and metal processing	63	74	75	70
Chemicals and rubber	61	74	75	69
Construction materials	62	79	97	73
Glass, china and ceramics	83	72	64	75
Wood and wood processing	100	112	146	109
Pulp and paper	51	88	49	66
Printing	n.a.	n.a.	n.a.	n.a.
Textiles and knitwear	76	94	83	84
Clothing	57	88	31	59
Leather, furs and footwear	61	95	94	78
Food (incl. beverages and tobacco)	60	85	182	85
Area Average (unweighted)				
Total manufacturing	63	70	88	71
Machine building and metal processing	60	66	81	67
Chemicals and rubber	65	67	88	70
Construction materials	80	83	111	85
Glass, china and ceramics	67	57	76	65
Wood and wood processing	94	71	128	90
Pulp and paper	56	63	111	66
Printing[1)]	84	92	107	91
Textiles and knitwear	81	87	121	93
Clothing	55	69	127	68
Leather, furs and footwear	51	71	188	70
Food (incl. beverages and tobacco)	57	73	91	70

1) excluding Soviet Union

A P P E N D I X C

Basic Statistical Tables and
Selected Bibliography to
Part II

Table C.1

Total Eastern trade with the world (SITC 0-9)
in US $ millions

Year	Exports			Imports		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	19710	8170	11540	19030	7810	11220
1970	30520	12800	17720	28560	11430	17130
1975	77360	33310	44050	82580	35310	47270
1976	84110	37169	46941	86965	36643	50322
1977	98106	45160	52946	95765	39834	55929
1978	112434	52216	60218	110448	45849	64599
1979	134735	64762	69973	127587	54275	73312

Table C.2

Total Eastern trade with the South (SITC 0-9)
in US $ millions

Year	Exports			Imports			Ratio of exports to imports %		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	2350	1490	860	1880	1080	800	1.25	1.38	1.07
1970	4030	2680	1350	2730	1690	1040	1.47	1.59	1.30
1975	10230	6170	4060	9110	5660	3450	1.12	1.09	1.18
1976	10859	6753	4106	9411	5388	4023	1.15	1.25	1.02
1977	14515	9467	5048	10464	6179	4285	1.39	1.53	1.18
1978	17102	11233	5869	11331	6980	4351	1.51	1.61	1.35
1979	19874	12867	7007	13214	7814	5400	1.50	1.65	1.30

Table C.3

Total Eastern trade with the OPEC region (SITC 0-9)
in US $ millions

Year	Exports			Imports			Ratio of exports to imports %		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	.	.	.	.	.	.	.	.	.
1970	670	370	300	220	150	70	3.05	2.47	4.29
1975	2640	1010	1630	2080	950	1130	1.27	1.06	1.44
1976	2547	1013	1534	2495	968	1527	1.02	1.05	1.00
1977	3354	1268	2086	2404	967	1437	1.40	1.31	1.45
1978	4396	2018	2378	2440	1030	1410	1.80	1.95	1.69
1979	4690	2226	2464	3676	1428	2248	1.28	1.56	1.10

Table C.4

Total Eastern trade with the NOPEC region (SITC 0-9)
in US $ millions

	Exports			Imports			Ratio of exports to imports %		
Year	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	.	.	.	.	.	.	.	.	.
1970	3360	2310	1050	2510	1540	970	1.34	1.50	1.08
1975	7600	5160	2440	7020	4700	2320	1.08	1.10	1.05
1976	8312	5740	2572	6916	4420	2496	1.20	1.30	1.03
1977	11161	8199	2962	8060	5212	2848	1.38	1.57	1.04
1978	12706	9215	3491	8891	5950	2941	1.43	1.55	1.19
1979	15184	10641	4543	9538	6386	3152	1.59	1.67	1.44

Table C.5

Eastern trade in manufactures with the world (SITC 5+6+7+8-68)
in US $ millions

	Exports			Imports		
Year	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	11910	3890	8020	11260	5110	6150
1970	17980	4950	13030	18280	8410	9870
1975	43690	11030	32660	53610	24370	29240
1976	46762	11987	34775	55460	25072	30388
1977	53493	14007	39486	61253	27891	33362
1978	62550	16707	45843	69390	31499	37891
1979	71556	18692	52864	78187	37306	40881

Table C.6

Eastern trade in manufactures with the South (SITC 5+6+7+8-68)
in US $ millions

	Exports			Imports		
Year	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	1535	790	745	178	100	78
1970	2315	1189	1126	426	274	152
1975	5330	2115	3215	1120	712	408
1976	5592	2228	3364	999	610	389
1977	6573	2691	3882	1105	729	376
1978	7543	3413	4130	1039	608	431
1979	9272	3810	5462	1110	604	506

Table C.7

Eastern trade in manufactures with the OPEC region (SITC 5+6+7+8-68)
in US $ millions

	Exports			Imports		
Year	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	.	.	.	.	.	.
1970	504	282	222	14	9	5
1975	1955	679	1276	35	18	17
1976	2020	686	1334	37	29	8
1977	2218	695	1523	45	38	7
1978	2539	952	1587	42	36	6
1979	2865	1051	1814	36	30	6

Table C.8

Eastern trade in manufactures wirth the NOPEC region (SITC 5+6+7+8-68)
in US $ millions

	Exports			Imports		
Year	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	.	.	.	.	.	.
1970	1815	909	906	412	268	144
1975	3370	1435	1935	1088	694	394
1976	3572	1542	2030	962	581	381
1977	4355	1996	2359	1060	691	369
1978	5004	2461	2543	997	572	425
1979	6407	2759	3648	1074	574	500

Table C.9

Share of the South in total trade of the East (table 2/table 1)
in %

Year	Exports			Imports		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	11.9	18.2	7.5	9.9	13.8	7.1
1970	13.2	20.9	7.6	9.6	14.8	6.1
1975	13.2	18.5	9.2	11.0	16.0	7.3
1976	12.9	18.2	8.7	10.8	14.7	8.0
1977	14.8	21.0	9.5	10.9	15.5	7.7
1978	15.2	21.5	9.7	10.3	15.2	6.7
1979	14.8	19.9	10.0	10.4	14.4	7.4

Table C.10

Share of the OPEC region in total trade of the East (table 3/table 1)
in %

Year	Exports			Imports		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	.	.	.	.	.	.
1970	2.2	2.9	1.7	0.8	1.3	0.4
1975	3.4	3.0	3.7	2.5	2.7	2.4
1976	3.0	2.7	3.3	2.9	2.6	3.0
1977	3.4	2.8	3.9	2.5	2.4	2.6
1978	3.9	3.9	3.9	2.2	2.2	2.2
1979	3.5	3.4	3.5	2.9	2.6	3.1

Table C.11

Share of the NOPEC region in total trade of the South (table 4/table 1)
in %

Year	Exports			Imports		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	.	.	.	.	.	.
1970	11.0	18.0	5.9	8.8	13.5	5.7
1975	9.8	15.5	5.5	8.5	13.3	4.9
1976	9.9	15.4	5.5	8.0	12.1	5.0
1977	11.4	18.2	5.6	8.4	13.1	5.1
1978	11.3	17.6	5.8	8.0	13.0	4.5
1979	11.3	16.4	6.5	7.5	11.8	4.3

Table C.12

Share of manufactures in Eastern trade with the world (table 5/table 1)
in %

Year	Exports			Imports		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	60.4	47.6	69.5	59.2	65.4	54.8
1970	58.9	38.7	73.5	64.0	73.6	57.6
1975	56.5	33.1	74.1	64.9	69.0	61.9
1976	55.6	32.2	74.1	63.8	68.4	60.4
1977	54.5	31.0	74.6	64.0	70.0	59.7
1978	55.6	32.0	65.6	62.8	68.7	58.7
1979	53.1	28.9	75.5	61.3	68.7	55.8

Table C.13

Share of manufactures in Eastern trade with the South (table 6/table 2)
in %

Year	Exports			Imports		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	65.3	53.0	86.6	9.5	9.3	9.8
1970	57.4	44.4	83.4	15.6	16.2	14.6
1975	52.1	34.3	79.2	12.3	12.6	11.8
1976	51.5	33.0	81.9	10.6	11.3	9.7
1977	45.3	28.4	76.9	10.6	11.8	8.8
1978	44.1	30.4	70.4	9.2	8.7	9.9
1979	46.7	29.6	78.0	8.4	7.7	9.4

Table C.14

Share of manufactures in Eastern trade with the OPEC region (table 7/table 3)
in %

Year	Exports			Imports		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	.	.	.	.	.	.
1970	75.2	76.2	74.0	6.4	6.0	7.1
1975	74.1	67.2	78.3	1.7	1.9	1.5
1976	79.3	67.7	87.0	1.5	3.0	0.5
1977	66.1	54.8	73.0	1.9	3.9	0.5
1978	57.8	47.2	66.7	1.7	3.5	0.4
1979	61.1	47.2	73.6	1.0	2.1	0.3

Table C.15

Share of manufactures in Eastern trade with the NOPEC region
(table 8/table 4)
in %

Year	Exports			Imports		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	.	.	.	.	.	.
1970	54.0	39.4	86.3	16.4	17.4	14.8
1975	44.3	27.8	79.3	15.5	14.8	17.0
1976	43.0	26.9	78.9	13.9	13.1	15.3
1977	39.0	24.3	79.6	13.2	13.3	13.0
1978	39.4	26.7	72.8	11.2	9.6	14.5
1979	42.2	25.9	80.3	11.3	9.0	15.9

Table C.16

Share of the South in Eastern trade in manufactures
(table 6/table 4)
in %

Year	Exports			Imports		
	CMEA	USSR	Eastern Europe	CMEA	USSR	Eastern Europe
1965	12.9	20.3	9.3	1.6	2.0	1.3
1970	12.9	24.0	8.6	2.3	3.3	1.5
1975	12.2	19.2	9.8	2.1	2.9	1.4
1976	12.0	18.6	9.7	1.8	2.4	1.3
1977	12.3	19.2	9.8	1.8	2.6	1.1
1978	12.1	20.4	9.0	1.5	1.9	1.1
1979	13.0	20.4	10.3	1.4	1.6	1.2

Sources: UNCTAD Handbook of International Trade and Development Statistics, Supplement 1980 (for 1965-1978)
UN Monthly Bulletin of Statistics, May 1981 (for 1979)

Note: For want of other data, export values of the appropriate other regions are taken as Eastern import values.

Table C.17

Shares of manufactured goods in exports of West, East and South 1965-1979[1)]

in %

Exports from / to	West	East	South	World
West				
1965	64,6	62,2	75,6	66,9
1970	70,4	76,1	78,3	72,2
1975	70,2	79,3	80,5	73,1
1979	70,7	71,9	80,3	72,8
East				
1965	35,6	67,0	65,3	60,4
1970	37,4	66,9	57,4	58,9
1975	34,0	67,1	52,1	56,5
1979	33,0	65,3	46,7	53,1
Eastern Europe				
1965	43,3	76,0	86,6	69,5
1970	49,6	81,5	83,3	73,5
1975	51,6	82,4	79,2	74,1
1979	54,1	84,5	78,0	75,5
South				
1965	9,5	9,4	23,2	12,3
1970	14,8	15,6	30,2	17,7
1975	13,2	12,3	23,2	15,3
1979	17,4	8,4	29,0	20,0
NOPEC				
1965	-	-	-	-
1970	21,0	16,8	38,8	25,4
1975	29,7	15,4	42,3	31,5
1979	37,7	11,3	49,4	39,4
World				
1965	52,1	59,2	64,0	55,2
1970	59,0	64,0	67,2	60,9
1975	54,0	64,9	64,5	57,4
1977	54,6	64,0	64,5	57,6
1978	57,8	62,8	66,1	60,4
1979	55,1	61,3	63,5	57,5

Sources: UNCTAD Handbook of International Trade and Development statistics, 1980; UN Monthly Bulletin of Statistics, May 1981.

1) SITC 5-8 minus 68

Table C.18

Shares of developing countries in total foreign trade of individual CMEA countries[1)]

in %

	Exports				Imports			
	1965	1970	1975	1979	1965	1970	1975	1979
Bulgaria	4.7	6.5	10.7	11.3	3.5	4.7	4.1	3.5
CSSR	9.8	9.0	8.6	7.8	7.8	6.1	5.6	4.9
GDR	4.5	4.2	4.4	5.7	4.6	3.9	4.4	4.8
Hungary	7.1	5.9	6.0	9.1	7.5	7.1	6.9	8.2
Poland	8.1	7.7	8.6	8.0	9.4	5.7	4.9	7.8
Romania	6.6	10.0	19.3	19.4	5.3	6.6	13.0	23.6
USSR	13.7	15.9	13.8	14.8	10.1	10.9	11.2	8.4

Source: Comecon Foreign Trade Data 1980

1) Compiled on the basis of national statistics. Developing countries do not include Cuba here.

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