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FUTURE STRUCTURAL CHANGES IN THE INDUSTRY OF THE FEDERAL REPUBLIC OF GERMANY*

Prepared by the
Global and Conceptual Studies Section
International Centre for Industrial Studies

UNIDO Working Papers on Structural Changes
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FOREWORD

This study was undertaken in the framework of UNIDO's research programme on industrial redeployment and structural adjustment. It constitutes a part of a first series of country studies designed to analyse past changes in the industrial structure of individual developed countries and to obtain an overview of future developments.

It is believed that by initiating and carrying out these studies and ensuring a broad dissemination of the reports, UNIDO may contribute to reducing uncertainties and highlighting pertinent trends of development and adjustment pressures, thereby creating a basis for an anticipatory adjustment policy. Concomitantly, the results would seem to be of direct relevance for the international debate on the future restructuring of world industrial production and trade, and for the conception of suitable policies and forms of industrial co-operation between the developed and the developing countries.

It is foreseen that additional studies be undertaken for attaining, on the one hand, a greater country average and, on the other, more disaggregated findings. In addition to carrying out its own studies, UNIDO will also endeavour to use relevant data and studies undertaken by other researchers in the respective countries. UNIDO and the informal International Working Group on Restructuring will co-ordinate the individual country studies. It will be attempted to assess the development prospects of developed countries in light of the industrialization plans and priorities of the developing countries. All findings will be regularly published and distributed.

This study of structural change in the Federal Republic of Germany was prepared by Klaus-Werner Schatz and Frank Wolter of the Kiel Institute of World Economics in co-operation with the UNIDO seoretariat (International Centre for Industrial Studies).

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I. Introduction

Since the early 1970s, the high income countries of Western Europe, North America, and Japan have met with increasing economic difficulties. In all of these countries inflation has accelerated, economic growth has slackened, and unemployment has risen.

The Federal Republic of Germany is no exception. Between 1970 and 1977, the yearly growth rate of gross domestic product dropped to 2.4 per cent, after having been almost twice as high during the 1960s. In no year during the 1970s has the Federal Republic's production capacity been fully used. Moreover, estimates[1/] reveal a steadily widening gap between potential growth of output and the growth of GDP. The rate of inflation doubled, and unemployment, which hovered around 1 per cent of the civilian labour force during the 1960s, rose sharply to 5 per cent; in addition, unemployment since 1970 has risen from 0.15 million to more than 1.0 million. The reduction in employment is even more dramatic than is revealed by these unemployment figures: at present the labour market reserve,[2/] which had practically been zero in 1970 (and during most of the 1960s), totals about 0.7 million. Since 1973, foreign labour employed in the Federal Republic of Germany has been reduced by 0.6 million. Compared to the situation in 1973[3/] the job gap in the Federal Republic of Germany as measured by open (official figures), disguised (labour market reserve), and "exported" unemployment (foreign labour) has reached about 1.84 million. Furthermore, the number of job-seekers is expected to expand until the second half of the 1980s. This means that in addition to jobs for persons now unemployed or in the

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1/ Sachverständigenrat (Council of Experts) 1977.

2/ Civilian labour force minus civilian employment minus persons unemployed.

3/ Compared to 1970, the job gap is only 1.54 million. This depends on the fact that from 1970 to 1973 there had been a substantial increase in the number of foreign workers which is now approximately as high as in 1970. From 1970 to 1973 there seem to have existed separated labour markets for German and for foreign labour: while the employment of foreigners increased, unemployment among Germans rose and the domestic labour market reserve increased.

labour market reserve, about 1 million jobs must be created if newcomers to the labour market are to find employment. In summary, by the second half of the 1980s a further 2.5 million jobs will have to be provided in order to reach full employment.

This situation in the high income countries in general, and in the Federal Republic of Germany in particular, has been attributed to a host of causal factors, both internal and external:

1. The collapse of the Bretton Woods system, which has left the business world with substantial short-term fluctuations of exchange rates.

2. Currency revaluations, which have removed artificial competitive advantages for tradables vis à vis non-tradables; currency devaluations, which have removed discriminations for the international sector.

3. Rapid changes in energy prices.

4. Strong opposition towards certain types of potentially polluting activities, nuclear power plants in particular, which has inhibited investments and has made the environment in high income countries a costly factor of production.

5. A narrowing of the scope for economic growth by imitation and technology transfer among the high income countries, e.g. via foreign direct investment, because of decreased international unit labour cost differentials (Horn, 1977); a slowing down of the flow of new major technological breakthroughs, with the exception of micro-processors (National Science Board, 1975).

6. Increasing vigorous competition from new sources of supply which has been felt both on traditional export markets and on domestic markets; the success of a number of developing countries during the 1980s in building up a substantial export potential for manufactured products; eagerness from countries with central economic planning to penetrate the high income countries' markets.

Whatever the relative weight of each of these factors and whatever the links among them, together they have created a climate of uncertainty and pessimistic expectations about future economic developments in the high income countries. This climate has manifested itself in a sharp decline of investment activities in the last few years. Moreover, price structures have become sticky, especially in industrial factor markets, and increasing government interventions and regulations have added to the growth of economic rigidities.[1/]

The present study is aimed at gaining some insight into the adjustment problems with which the Federal Republic of Germany is presently being confronted given the economic changes listed above. The study is organized in five chapters. Following the introduction, Chapter II is designed to provide an overview of past economic growth and structural change in the Federal Republic of Germany and an analysis of adjustment pressures which have emerged. This analysis concentrates on changes in the international competitive position of the Federal Republic of Germany as compared to other high-income countries and the developing countries. Chapter III investigates in more detail the nature of the division of labour between the Federal Republic of Germany and the developing countries in terms of trade of manufactured goods. Findings of the previous chapters are used in Chapter IV to sketch probable future industrial production and trade structures. Policy considerations are taken up in Chapter V where the emphasis is on the nature of conflicts between adjustment pressures resulting from the new international division of labour and national goals, such as, full employment, economic growth, etc.

1/ For empirical evidence in the case of the Federal Republic of Germany see [Glismann, Rodemer, Wolter 1978].

II. Employment, Growth, and Structural Change in the Federal Republic of Germany in the Post-War Period

Still in 1950, the economic situation of the Federal Republic of Germany seemed disastrous. While other European countries and North America had changed from war economies to peace economies in a relatively short time and while in most countries production had already surpassed pre-war figures substantially by the end of the 1940s, the Federal Republic of Germany was far from having recovered from the devastation of war, defeat, and military occupation. Official figures show that nearly 10 per cent of the labour force (about 1.9 million persons) were unemployed and that unemployment was increasing. However, to do away with disguised unemployment and to provide work for the influx of immigrants, 4 to 5 million jobs had to be provided if full employment was to be reached by 1955 (Viability and Full Employment, 1950, p. 17).

In September 1949 the currency reform was enacted. Barriers to international trade and capital movement were substantially removed in the early 1950s. As prices began to reflect the forces of supply and demand, the Federal Republic of Germany proved to be an attractive place for investment and production. In 1955, the unemployment rate was still 3.9 per cent, but within five years three million additional jobs had been created. In 1960, full employment was practically reached and more than additional 4.5 million persons had found working places. Real GNP was more than twice as high as in 1950; real GNP per capita reached nearly 90 per cent of the (weighted) average GNP per capita of the OECD countries, while it had amounted to only 60 per cent in 1950.

Throughout the 1950s, trade unions in the Federal Republic of Germany pursued extremely moderate wage policies.[1/] As a result, the wage

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[1/] The moderate policies of trade unions become evident also in an international comparison of working days lost by industrial disputes: In the 1950s in the Federal Republic of Germany 44 working days per 1000 persons employed were lost while it was about 190 in the (weighted) average of the other OECD countries.

and salary share of national income barely increased and wages and salaries per wage - and-salary-earner fell substantially in relation to national income per person employed (table 1). Nonetheless, real income of wage and salary earners did increase. As compared to other countries, the Federal Republic of Germany experienced relatively low rates of inflation and became increasingly competitive against foreign suppliers. Between 1950 and 1960 exports grew at an annual rate of about 19 per cent, and imports at only 15 per cent, while the Federal Republic's share in world manufacturing exports climbed from 3.6 per cent to 10.1 per cent. By the end of the 1950s it became obvious that the moderate rates of inflation in the Federal Republic of Germany had brought about an undervaluation of the D-Mark, which led to increasing foreign exchange reserves. At this time many observers warned that the growth of Federal Republic exports could not merely be attributed to comparative advantages, and argued that it was partly due to artificial advantages: The undervaluation of the D-Mark made Federal Republic export products artificially cheap on world markets.

In 1961, the D-Mark was revalued by 5 per cent against the US-Dollar. This revaluation did not, however, seem to hinder suppliers in the Federal Republic of Germany in the years following, when the suppliers continued to strengthen their position against foreign competitors. As in the 1950s, trade unions in the Federal Republic of Germany continued to demand relatively low wage increases, thus supporting the undervaluation. In the 1960s, however, the unions pressed for shorter working hours. As a result, average hours worked per worker were reduced by 1.1 per cent yearly, while it had been only 0.5 per cent in the 1950s. This tightening of the labour market became even more severe after mid-1961, when, at the same time as full employment of the labour force had been accomplished (table 1), the inflow of labour to the Federal Republic was nearly stopped. Under these circumstances one could have expected intensified efforts by the Federal Republic producers to substitute physical capital for labour. However, with the foundation of the EC, free movement of labour within the EC meant that firms in the Federal Republic of Germany turned instead to the employment of foreign workers.

Table 1 - Some macroeconomic indicators for the Federal Republic of Germany, 1950-1977

Indicator	1950[a]	1960	1973	1973	1977[b]
Labour force					
- Millions	23.070	26.518	26.817	26.985	25.952
- Percentage of total population	46.1	47.8	44.2	43.5	42.4
Persons employed					
- Millions	21.171	26.247	26.668	26.712	24.922
- Percentage of total population	42.9	47.3	44.0	43.1	40.7
- Foreign wage earners and salaried employees					
- Millions	u.a.	0.279	1.807	2.425	1.860
- Percentage of all wage earners and salaried employees	u.a.	1.4	8.1	10.7	8.8
Unemployed					
- Millions	1.900	0.271	0.149	0.273	1.030
- Percentage of total labour force	8.9	1.0	0.6	1.0	4.0
Gross investment as percentage of Gross National Income	22.9	25.4	25.6	25.1	22.1
Net investment as percentage of Net National Income	14.6	19.2	17.3	16.0	11.3
Investment per person employed (annual percentage change against year previous in this table)					
- Gross investment	-	6.8	4.6	3.3	-0.1
- Net investment	-	9.5	3.1	0.9	-5.5
Wages and salaries as percentage of National Income	58.3	60.4	67.8	70.7	72.0
Wages and salaries per wage earner and salaried employed as percentage of National Income per person employed	84.9	78.2	81.3	83.7	84.5

[a]Including the Saar and West-Berlin, for which own estimates have been made. - [b]Partly own estimates.

Source: Statistisches Bundesamt, Fachserie 18, Volkswirtschaftliche Gesamtrechnungen, Reihe S.2, Revidierte Ergebnisse, 1960 bis 1976, Stuttgart und Mainz, 1977. - Statistisches Bundesamt, Fachserie N, Volkswirtschaftliche Gesamtrechnungen, Reihe 3, Sonderbeiträge, Revidierte Reihen ab 1950, Stuttgart und Mainz, 1972. - Statistisches Bundesamt, Wirtschaft und Statistik, 1978, Heft 2. - Own calculations and estimates.

Due to the employment of foreign labour, first mainly from the EC member country Italy, afterwards also from Turkey, Jugoslavia, Spain and Portugal, manufacturing was able to expand rapidly both in terms of production and employment. In 1970, about 1.8 million foreign workers were employed in the Federal Republic of Germany (1960: 0.3 million), of which 65 per cent had a job in manufacturing; at the same time, 12.6 per cent of all wage and salary workers in manufacturing were foreign.[1/] The share of Federal Republic manufacturing both in domestic employment and production became larger than in any other country in the world (tables 2, 3 and 4). The production and employment structure of the Federal Republic of Germany came to diverge from the pattern in other developed countries in the following way: (a) throughout the post war period the share of the secondary sector and of manufacturing in production and employment has been much higher, and the weight of the tertiary sector substantially lower, than in countries with a comparable level of per capita income; (b) in the 1960s, when the Federal Republic of Germany surpassed the level of per capita income which has been associated with a relative decline of the secondary sector and manufacturing in other developed countries, both the share of the secondary sector and manufacturing production and employment continued to expand.

Since the end of the 1960s, the competitive position of industry in the Federal Republic of Germany seems to have worsened substantially. The Bretton-Woods system of fixed exchange rates collapsed and was followed by a readjustment of currencies in the course of which the D-Mark was revalued against the US-Dollar and the currencies of most other important trading partners (table 5): compared to exchange rates of the late 1960s, the weighted average rate - up to 1977 - of revaluation against the currencies of the most important competitors amounted to 64 per cent.[2/] With the

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1/ In France for instance, at the end of the 1960s as already in the 1950s, only about a third of all foreigners were employed in manufacturing. Foreigners accounted for 7.7 per cent of all wage and salary employment. See: W. R. Böhning (1975)

2/ Table 5 refers to 11 out of the 12 most important trading partners of the Federal Republic of Germany. These 11 countries account for 64.1 per cent of external trade of the Federal Republic of Germany (1973-75 average). Austria which also belongs to this group, has not been included because of some missing information.

Table 2 - Sectoral percentage shares in GDP, Federal Republic of Germany, 1950-1977

Sector	1950[a]	1960	1970	1973	1977
	Sectoral percentage shares at 1970 prices[b]				
Primary Sector	8.0	4.9	3.4	3.4	3.0
Secondary Sector	41.4	50.3	52.8	52.6	51.1
- Manufacturing	27.7	36.6	40.6	40.1	39.9
Tertiary Sector	50.6	44.8	43.8	43.9	45.9
- Community, Social and Personal Services	17.0	11.6	10.6	10.7	11.2
	Sectoral percentage shares at current prices				
Primary Sector	10.2	5.8	3.4	3.1	2.5
Secondary Sector	49.6	53.5	52.8	50.3	47.9
- Manufacturing	39.1	40.4	40.6	37.8	36.7
Tertiary Sector	40.2	40.8	43.8	46.6	49.6
- Community, Social and Personal Services	9.6	8.8	10.6	12.1	13.3
GDP at 1970 prices (Mill. DM)	198.9[b,c]	428.7	678.8	761.8	808.2

[a]Excluding the Saar and West-Berlin. - [b]For 1950 original figures at 1962 prices rebased to 1970 prices. - [c]Including the Saar and West-Berlin.

Source: Statistisches Bundesamt, Fachserie 18, Volkswirtschaftliche Gesamtrechnungen, Reihe S.2, Revidierte Ergebnisse, 1960 bis 1976, Stuttgart und Mainz, 1977. - Statistisches Bundesamt, Fachserie N, Volkswirtschaftliche Gesamtrechnungen, Reihe 3, Sonderbeiträge, Revidierte Reihen ab 1950, Stuttgart und Mainz, 1972. - Statistisches Bundesamt, Wirtschaft und Statistik, 1978, Heft 2. - Own calculations and estimates.

Table 3 - Sectoral percentage shares in total employment, Federal Republic of Germany, 1950-1977

Sector	1950[a]	1960	1970	1973	1977
Primary Sector	24.1	13.7	8.5	7.3	6.8
Secondary Sector	42.0	47.9	48.8	47.9	45.6
- Manufacturing	31.7	37.2	38.7	38.0	36.5
Tertiary Sector	33.9	38.4	42.7	44.8	47.6
- Community, Social and Personal Services	8.0	8.0	11.2	12.5	-
Total Employment (Mill. persons)	21.449[b]	26.247	26.668	26.712	24.922

[a]Excluding the Saar and West-Berlin. - [b]Including the Saar and West-Berlin. Estimated figure under the assumption of a same relation between employment in the bigger regional aggregate and the smaller aggregate as in 1960. Total employment excluding the Saar and West-Berlin: 1960: 24,609 Mill., 1950: 19,975 Mill.

Source: See table 2.

Table 4 - Normal Patterns of Development and Structural Change[a] and Divergences in the Federal Republic of Germany from the Normal Pattern, 1960-1977

Year	1960	1965	1970	1971	1972	1973	1974	1975	1976	1977
Sector	West German GDP per Capita - 1970 - US-Dollar									
	2105	2552	3106	3162	3249	3397	3416	3346	3544	3639
	Normal Production Structure - Percentage Share in Output[b]									
Primary Sector	7.9	6.5	5.3	5.2	5.1	4.8	4.8	4.9	4.6	4.5
Secondary Sector	43.7	44.0	43.5	43.4	43.3	43.0	42.9	43.0	42.6	42.4
Manufacturing	32.8	32.7	31.9	31.8	31.6	31.3	31.1	31.1	30.8	30.5
Tertiary Sector	48.4	49.5	51.2	51.4	51.6	52.2	52.3	52.1	52.8	53.1
	West German Divergency - Actual West German Share Minus Normal Share									
Primary Sector	-2.1	-2.1	-1.9	-2.0	-1.9	-1.7	-2.1	-2.0	-1.8	-2.0
Secondary Sector	9.8	9.2	9.3	8.2	7.3	7.3	6.6	4.3	5.3	5.5
Manufacturing	8.4	7.5	7.4	7.1	8.4	9.4	9.5	8.0	7.0	6.2
Tertiary Sector	-7.7	-7.1	-7.4	-6.2	-5.4	-5.6	-4.5	-2.3	-3.5	-3.5
	Normal Employment Structure - Percentage Share in Employment									
Primary Sector	14.4	11.6	9.4	9.2	9.0	8.5	8.5	8.6	8.1	7.9
Secondary Sector	42.1	41.8	40.3	40.1	39.9	39.3	39.2	39.5	38.8	38.4
Manufacturing	29.8	29.8	29.1	29.0	28.9	28.5	28.5	28.6	28.2	28.0
Tertiary Sector	43.5	46.6	50.3	50.7	51.1	52.2	52.3	51.9	53.1	53.7
	West German Divergency - Actual West German Share Minus Normal Share									
Primary Sector	-0.7	-0.9	-0.9	-1.2	-1.4	-1.2	-1.3	-1.4	-1.3	-1.1
Secondary Sector	5.8	7.1	8.5	8.5	8.2	8.6	8.1	6.4	6.6	7.2
Manufacturing	7.4	8.2	9.6	9.4	9.0	9.5	9.1	8.1	8.2	8.5
Tertiary Sector	-5.1	-6.2	-7.6	-7.3	-6.8	-7.4	-6.8	-5.0	-5.3	-6.1

[a]Calculated from cross country estimates for 21 OECD countries in 1971. - [b]At current prices.

Source: G. Fels and K.-W. Schatz, Sektorale Entwicklung und Wachstumsaussichten der westdeutschen Wirtschaft bis 1980. Die Weltwirtschaft, Tübingen, 1974, H. 1, pp. 52 sq., tables 6 and 7. - See tables 2 and 3. - Own estimates and calculations.

Table 5 - Indices (1967=100) of Output per Hour, Hourly Compensation, Unit Labour Costs and Level of Total Compensation per Hour Worked (DM) in Manufacturing, Selected Countries, 1967-1977

Country	Weight[a]	Output per hour		Hourly compensation in national currency		Unit labour costs in national currency		Units of national currency per DM		Unit labour costs on DM basis[b]		Total compensation per hour worked in DM[c]		
		1970	1977	1970	1977	1970	1977	1970	1977	1970	1977	1967	1970	1977
Belgium	12.95	129.5	218.5	131.2	366.5	101.3	167.7	109.3	123.8	92.7	135.4	6.27	7.58	19.34
Canada	1.40	115.2	145.5	124.3	260.0	107.9	178.7	105.7	169.1	102.1	105.7	10.50	12.59	17.52
Denmark	2.81	129.3	200.4	145.0	361.4	112.1	180.3	117.5	147.7	95.5	122.1	-	-	-
France	18.88	121.2	175.3	134.7	356.4	111.1	203.3	122.9	171.5	90.5	118.5	5.66	6.31	11.97
Italy	13.10	117.8	180.7	141.1	596.0	119.8	329.8	109.9	244.1	109.0	135.1	4.75	6.08	11.80
Japan	2.65	146.5	217.2	164.2	477.9	112.1	220.0	101.2	118.8	110.8	185.2	2.24	3.61	9.25
Netherlands	18.56	134.4	197.8	146.2	365.4	108.8	184.9	109.7	117.0	99.1	158.0	6.09	7.80	18.05
Sweden	4.68	124.5	176.7	131.4	333.6	105.5	188.8	109.8	148.6	96.1	127.0	8.81	10.79	20.00
United Kingdom	7.02	109.1	129.0	132.8	392.8	121.7	304.5	125.5	273.8	97.0	111.2	5.02	5.41	7.51
United States	11.70	104.5	123.4	121.7	212.2	116.5	172.0	109.3	171.7	106.5	100.2	13.71	15.28	17.32
Switzerland	6.24	125.5	165.6	124.7	223.1	99.4	134.7	108.9	95.2	91.3	141.6	-	-	-
Weighted Average	100.00	122.7	177.3	135.7	369.0	110.9	209.8	113.1	164.0	98.3	131.1	6.83	8.09	15.00
Germany, F.R.	-	116.6	164.9	133.0	240.5	114.1	145.8	100.0	100.0	114.1	145.8	6.36	8.48	17.93

[a] Share in external trade of the Federal Republic of Germany, 1973-75 average.

[b] Unit labour costs in national currency adjusted for exchange rate changes against the D-mark. - [c] Includes hourly compensation and other significant components that are regarded as labour costs to the employer

Source: US Department of Labour, Bureau of Labour Statistics, Handbook of Labour Statistics, Bulletin 1966, Washington, D.C., Table 150 and 151. - Deutsche Bundesbank, Statistische Beihefte zu den Monatsberichten der Deutschen Bundesbank, Reihe 5, Die Währungen der Welt, Mai 1978, Nr. 2. - Own estimates and calculations.

new exchange rates, the Federal Republic of Germany became a much more expensive place to produce. Around the middle of the 1960s the Federal Republic of Germany had a wage cost level very similar to the average of its most important trading partners (table 5). However, important differences existed in the wage structures among the individual countries. Until 1970, differences between the countries had become slightly smaller, but the relative positions had scarcely changed. While in 1967 wage cost differences between the country with the highest cost level and the country with the lowest was more than 600 per cent; by 1977, it was less than 300 per cent. Moreover wage cost differences did not only become smaller, but relative cost positions of individual countries changed. Thus the USA and Canada, the countries with the highest cost levels in the previous period, had only a middle place by 1977. While accounting for only fifty per cent of US wage costs in the 1960s, the Federal Republic of Germany is now a country with one of the highest wage rates in the world. Increases in labour productivity were outrun by increases in wage costs and unit labour costs increased by nearly half as compared to 1967. Moreover, profits per unit of output declined significantly (table 6).

Foreign competitors were able to improve their position vis à vis producers in the Federal Republic of Germany on world markets as well as on domestic markets (table 7).[1/] The relative decline in profits of manufacturing industries located in the Federal Republic of Germany has led to reactions by international investors. Until 1973, Northamerican direct investment in the Federal Republic of Germany had been much more important than Federal Republic investment in North America; the same is true for investment relations between the Federal Republic of Germany and the developed countries taken together (table 8). Since 1973/74 residents of the Federal Republic

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1/ The share of the Federal Republic of Germany in developing country exports of manufactured goods declined from 20.1 per cent in 1973 to 19.0 per cent in 1977 (1976: 18.6 per cent).

Table 6 - Indices (1967 = 100) of Unit Labour Costs in Manufacturing and of Unit Values of Manufactured Goods Exports, Selected Countries, 1967 - 1977 (DM-Basis)

Country/Region	Unit Labour Costs in Manufacturing		Unit Values of Manufactured Goods Exports		Unit Labour Costs as a Percentage of Unit Values			
					1970	1977	Germany, F.R. = 100	
	1970	1977	1970	1977			1970	1977
Belgium	92.7	135.4	100.5	127.4	92.2	106.3	82.1	100.9
Canada	102.1	105.7	103.9	106.6	98.3	99.2	87.5	94.2
Denmark	95.5	122.1	96.3	138.6	99.2	88.1	88.3	83.7
France	90.5	118.5	96.3	127.5	94.0	92.9	83.7	88.2
Italy	109.0	135.1	100.5	123.5	108.5	109.4	96.6	103.9
Japan	110.8	185.2	101.6	130.7	109.1	141.7	97.2	134.6
Netherlands	99.1	158.0	94.3	123.1	105.1	128.4	93.6	121.9
Sweden	96.1	127.0	102.8	151.8	93.5	83.7	83.3	79.4
United Kingdom	97.0	111.2	96.3	123.8	100.7	85.1	89.7	80.8
United States	106.5	108.2	102.8	117.1	103.4	85.6	92.1	81.3
Switzerland	91.3	141.6	98.3	148.4	92.9	95.4	82.7	90.6
Weighted Average[a]	98.3	131.1	98.4	127.2	99.8	102.9	88.9	97.7
Germany, F.R.	114.1	145.8	101.6	128.5	112.3	105.3	100.0	100.0

[a] Weights from Table 5.

Source: UN, Monthly Bulletin of Statistics, Various Issues. - See Table 5. - Own Calculations.

Table 7 - Foreign Trade of the Federal Republic of Germany with Goods of Manufacturing Industries, 1970-1977

Year	Imports						Exports					
	Total		From Developed Countries		From Developing Countries		Total		From Developed Countries		From Developing Countries	
	1970 = 100	Percentage Change Against Previous Year p.c.	1970 = 100	Percentage Change Against Previous Year p.c.	1970 = 100	Percentage Change Against Previous Year p.c.	1970 = 100	Percentage Change Against Previous Year p.c.	1970 = 100	Percentage Change Against Previous Year p.c.	1970 = 100	Percentage Change Against Previous Year p.c.
1970	100.0	15.5	100.0	16.3	100.0	6.4	100.0	9.6	100.0	10.4	100.0	6.6
1971	108.8	8.8	109.3	9.3	102.2	2.2	108.9	8.9	108.7	8.7	110.1	10.1
1972	119.4	9.7	119.7	9.5	112.6	10.2	119.4	9.6	119.0	9.5	114.0	3.5
1973	134.9	13.0	133.3	11.4	140.6	24.9	143.5	20.2	141.2	18.7	137.6	20.7
1974	154.5	14.5	151.9	14.0	164.2	16.8	185.4	29.2	174.6	23.7	216.8	96.9
1975	161.6	4.6	159.4	4.9	168.9	2.9	177.1	- 4.5	159.2	- 8.8	243.6	12.4
1976	195.7	21.1	190.9	19.8	221.4	31.1	205.9	16.3	188.2	18.2	281.6	15.6
1977	210.0	7.3	202.2[a]	5.9[a]	243.5[a]	10.0[a]	219.3	6.5	200.2[a]	6.4[a]	311.2[a]	10.5[a]

[a] Estimated

Source: Statistisches Bundesamt, Wirtschaft und Statistik, Mainz und Wiesbaden, various issues. - Statistisches Bundesamt, Fachserie 7, Außenhandel, Reihe 7: Außenhandel nach Ländern und Warengruppen der Industriestatistik (Spezialhandel), Stuttgart und Mainz, various issues. - Own calculations.

Table 8 - The Development of Direct Investment Abroad by the Federal Republic of Germany, 1965 - 1977 (Mio. DM)

Period/ Year	Direct Investment Abroad by the FRG				Foreign Direct Investment in the FRG			
	Total	In:			Total	From:		
		Developed Countries	Developing Countries	USA and Canada		Developed Countries	Developing Countries	USA and Canada
1965/70	10 413.2	-	-	1 734.4	13 675,3	-	-	6 898,5
1970	3 494.7	2 665.8	828.9	548.3	2 729.4	2 616.3	113.1	801.6
1971	2 667.7	2 201.5	465.9	575.0	3 986.0	3 891.0	89.5	1 977.3
1972	2 816.2	1 617.0	1 198.7	327.1	3 728.4	3 736.1	- 23.1	1 479.9
1973	5 638.1	3 863.7	1 772.8	689.5	6 127.7	5 847.9	239.8	1 851.2
1974	4 529.9	3 376.8	1 150.6	1 053.9	4 483.9	4 238.2	235.7	1 382.0
1975	5 526.6	3 743.9	1 481.2	1 003.2	2 528.2	2 162.2	348.4	673.4
1976	5 056.9	3 103.9	1 928.3	1 455.3	3 064.0	2 905.7	150.9	774.9
1977	5 093.8	3 576.0	1 515.4	1 706.8	3 734.6	3 565.5	144.1	1 184.7
1970/73	14 616.7	10 348.0	4 266.3	2 139.9	16 571.5	16 091.3	239.8	6 110.0
1974/77	20 207.2	13 800.6	6 075.5	5 219.2	13 810.7	12 871.6	879.1	4 015.0
1965/73	25 029.9	-	-	3 874.3	30 246.8	-	-	13 008.5
1965/77	45 237.1	-	-	9 093.5	44 057.5	-	-	17 023.5

[a]Net Capital Transfer of West German Residents for Investment Abroad. - [b]Net Capital Transfer of Foreigners for Investment on Territory of the Federal Republic of Germany including West-Berlin).

Source: Der Bundesminister für Wirtschaft, Runderlaß Außenwirtschaft betreffend IV 1; Vermögensanlagen Gebietsansässiger in fremden Wirtschaftsgebieten,

- Runderlaß Nr. 18/65, Bundesanzeiger Nr. 66 vom 6.4.1965,
- Runderlaß Nr. 17/72, Bundesanzeiger Nr. 65 vom 6.4.1972,
- Runderlaß Nr. 17/74, Bundesanzeiger Nr. 78 vom 25.4.1974,
- Runderlaß Nr. 11/77, Bundesanzeiger Nr. 78 vom 26.4.1978.

Ders., Runderlaß Außenwirtschaft betreffend IV 1; Vermögensanlagen Gebietsfremder im Wirtschaftsgebiet,

- Runderlaß Nr. 41/65, Bundesanzeiger Nr. 222 vom 26.11.1965,
- Runderlaß Nr. 18/72, Bundesanzeiger Nr. 65 vom 6. 4.1972,
- Runderlaß Nr. 18/74, Bundesanzeiger Nr. 78 vom 25. 4.1974,
- Runderlaß Nr. 12/77, Bundesanzeiger Nr. 78 vom 26. 4.1978.

Own Calculations.

of Germany invested much more in other developed countries than residents from these countries invested in the Federal Republic of Germany. Thus, in the last years, the balance of foreign direct investment which had always been positive for the Federal Republic of Germany vis à vis other developed countries has become negative.

III. The Nature of the Division of Labour

Between the Federal Republic of Germany and the Developing Countries

On the whole, the Federal Republic of Germany shows comparative advantages and disadvantages of the same size and in approximately the same product groups as other developed countries (table 9).[1/] In the 1970s, as opposed to the 1960s, trade between the Federal Republic of Germany and developing countries has increased substantially faster than trade between the Federal Republic of Germany and the developed countries (table A 1, see Appendix). Both import and export flows in trade with developing countries expanded at higher rates than the respective flows in trade with developed countries.

In trade with developed countries, there was a shift to capital goods at the expense of primary and intermediate goods and consumer goods in imports. On the other hand there was a shift to consumer goods, particularly food, at the expense of the other product groups in exports. In trade with developing countries not only capital goods, but also consumer goods gained in imports. In exports, capital goods became more important. For both imports and exports and for both country groups primary and intermediate goods have lost in weight. Generally, changes in trade patterns were more marked for trade of the Federal Republic of Germany with developing countries than with developed countries. The share of capital goods imports in total imports from developing countries rose from roughly 1 per cent in 1962 to about 13 per cent in 1976. Nonetheless, during the 1960s, developing countries actually lost in importance as a source of supply and demand for the Federal Republic of Germany. But by relative fast growth rates of trade in the 1970s, this trend was reversed. By 1976, the developing countries had regained their position of the early 1960s as importers of goods from the Federal Republic of Germany, but this was mainly due to booming demand from OPEC countries after the oil price hikes. The decline on the import side

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1/ The Spearman coefficient of rank correlation between the Federal Republic of Germany and OECD RCA-values is 0.92 (1976; 1963: 0.93).

Table 9 - International competitiveness of the Federal Republic of Germany in 28 groups of processed industrial goods, 1963-1976

SITC No.	Product Group	RCA values[a] in trade with:							
		OECD countries				Developing countries			
		1963	1970	1973	1976	1963	1970	1973	1976
51	Chemical elements and compounds	- 3.5	- 8.5	- 3,5	- 5.6	30.1	42.7	46.9	60.3
52	Mineral tar and crude chemicals from coal, petroleum and natural gas	-11.0	-38.8	-53.0	-81.3	.	-13.5	43,4	.
53	Dyeing, tanning and colouring materials	38.9	46.4	43.0	41.9	82.4	94.2	96.4	95.9
54	Medical and pharmaceutical products	3.2	14.3	6.7	- 0.4	84.1	77.6	72.3	52.9
55	Essential oils and perfume materials, etc.	-25.1	- 5.3	- 6.0	- 8.4	26.4	68.8	59.7	73.7
56	Fertilizers, manufactured	64.6	19.9	13.8	-21.7	98.7	96.2	45.9	- 4.4
57	Explosives and pyrotechnic products, n.e.s.	-19.1	30.9	- 5.5	9.6	.	20.5	-13.0	51.6
58	Plastic materials, etc.	19.6	4.2	- 0.7	- 0.8	96.4	95.5	96.7	95.8
59	Chemical materials and products, n.e.s.	- 9.1	14.4	9.4	13.6	60.0	87.0	83.8	88.8
61	Leather, leather manufactures, etc.	-37.1	-34.3	-30.5	-24.0	-61.7	-67.9	-68.1	-71.7
62	Rubber manufactures, n.e.s.	-21.3	-18.3	- 9.7	-12.8	70.1	30.6	34.3	1.0
63	Wood and cork manufactures (excl. furniture)	-39.1	-30.4	-40.2	-28.2	-52.5	-58.7	-77.2	-40.2
64	Paper, paperboard and manufactures thereof	-51.4	-46.5	-39.1	-33.6	58.6	71.8	69.4	45.8
65	Textile yarn, fabrics, made-up articles, etc.	-43.1	-19.9	-19.7	-15.8	-40.8	-29.3	-32.7	-40.9
66	Non-metallic mineral manufactures, n.e.s.	- 3.8	- 7.3	-17.1	-11.5	-13.1	-18.6	-20.2	-13.4
67	Iron and steel	-10.0	- 9.4	- 7.9	- 9.4	84.0	54.6	42.5	43.1
68	Non-ferrous metals	43.1	-43.7	-28.9	-22.5	-87.4	-83.2	-72.1	-67.6
69	Manufactures of metal, n.e.s.	33.0	20.5	10.4	12.9	91.8	77.5	54.3	53.7
71	Machinery, other than electric	25.0	24.8	29.5	27.0	92.6	90.1	86.4	83.0
72	Electrical machinery, apparatus and appliances	21.1	6.0	5.0	4.5	93.5	65.3	40.1	27.6
73	Transport equipment	52.2	25.4	32.5	23.0	94.2	92.2	86.6	90.4
81	Sanitary, plumbing, heating and lighting, etc.	3.1	26.3	- 2.0	- 4.5	40.0	46.4	33.0	47.8
82	Furniture	9.3	14.6	1.4	10.4	-31.4	-28.9	-30.5	-14.0
83	Travel goods, handbags and similar articles	22.6	-12.1	-26.5	-30.5	-20.8	-51.4	-75.7	-85.8
84	Clothing	-41.0	-44.3	-47.1	-39.8	-82.4	-88.2	-88.0	-92.8
85	Footwear	-62.1	-59.0	-66.7	-67.7	-80.2	-80.6	-87.1	-89.0
86	Professional, scientific and controlling instruments; photographic and optical goods; watches and clocks	29.4	10.1	- 0.6	- 2.1	93.8	86.4	47.0	2.7
89	Miscellaneous manufactured articles, n.e.s.	12.6	7.8	- 1.8	- 2.5	25.9	-22.0	-21.0	-34.[illegible]

[a] For method of computation see Appendix I.

Sources: OECD, Statistics of Foreign Trade, Series B and Series C, Trade by Commodities, various issues. - Own calculations.

Table 10 - Share of Exports to Developing Countries in Total Exports by Industry, Federal Republic of Germany, 1962-1976 (p.c.)

Industry \ Year	1962	1970	1971	1972	1973	1974	1975	1976
Primary and intermediate goods ind.	15.9	12.7	13.0	12.1	12.2	14.3	14.5	12.9
Stones and earthen goods ind.	11.1	7.9	8.1	8.0	7.7	10.7	17.7	15.4
Iron and steel ind.	10.4	7.7	8.8	8.6	8.3	14.5	12.6	8.9
Foundries	16.5	7.5	7.0	7.1	11.6	13.9	24.3	23.4
Cold rolling mills	14.7	10.4	10.2	8.7	8.2	12.1	11.1	9.5
Non-ferrous metal ind.	8.3	7.1	8.3	6.6	7.0	8.5	10.9	8.8
Mineral oil ind.	3.6	3.8	4.4	4.5	3.0	3.1	3.7	3.5
Chemical ind.	22.4	17.5	17.0	15.9	17.0	17.5	17.6	16.6
Sawmills and woodwork ind.	2.7	3.5	2.9	2.6	2.4	2.6	4.9	5.4
Pulp, paper, paperboard ind.	7.8	7.1	7.2	5.5	6.5	8.7	6.8	5.8
Rubber and asbestos man. ind.	21.0	10.0	11.8	7.9	7.1	10.2	11.1	9.0
Capital goods ind.	18.1	13.4	13.5	13.0	13.2	16.5	20.7	21.1
Structural and light metal eng.	35.8	16.1	16.9	16.5	12.6	19.3	30.0	39.1
Mechanical engineering	17.7	15.4	16.1	15.9	15.2	18.3	22.8	24.6
Man. of road vehicles	17.0	12.1	10.8	10.2	11.2	17.2	23.5	20.1
Shipbuilding	20.6	26.4	34.0	25.2	32.3	39.3	29.5	36.2
Aircraft man.	7.6	6.8	4.5	6.2	6.2	11.6	8.9	7.3
Electrical engineering	18.5	12.9	13.2	13.2	12.4	13.4	17.5	19.8
Precision and optical goods, watches	15.4	12.1	12.5	11.6	11.8	13.6	14.1	14.2
Steel processing	14.5	8.5	8.7	8.2	8.1	9.9	12.4	11.1
Iron, sheet and metal goods ind.	19.5	11.3	10.2	8.9	9.7	12.0	12.5	12.5
Office machines and data proc.	.[a]	7.5	6.0	6.8	6.2	6.9	7.3	7.0
Consumer goods ind.	9.5	5.8	5.4	5.0	5.3	6.3	6.1	6.6
Fine ceramics ind.	8.2	6.4	6.5	5.8	5.6	6.7	7.3	6.9
Glass and glass prod. ind.	11.2	7.9	7.7	7.2	6.9	7.9	8.6	8.6
Woodwork man. ind.	8.9	3.6	3.5	2.9	3.4	3.7	6.3	9.5
Musical instr., toys, sport. goods ind.	9.1	6.7	6.9	5.3	5.3	6.2	6.3	5.7
Pulp and paper man. ind.	13.0	6.7	6.5	6.3	6.6	8.2	7.2	7.8
Printing and publishing	7.1	4.9	5.0	4.9	4.4	4.8	5.1	5.0
Plastics prod. ind.	9.4	4.8	4.8	4.0	3.9	5.2	5.6	5.6
Leather ind.	11.9	5.1	4.5	4.7	4.6	5.5	4.4	4.3
Leather man. ind.	10.7	10.2	9.1	8.6	9.4	10.4	10.3	8.8
Shoe ind.	5.5	3.1	2.9	3.2	3.5	4.9	4.7	4.5
Textile ind.	10.4	6.8	5.8	6.2	6.9	7.9	6.9	7.5
Clothing ind.	5.2	3.0	2.9	2.3	2.2	2.6	2.6	3.1
Food, beverages, tobacco	15.6	9.5	11.7	8.8	7.7	8.9	8.5	10.9
Manufacturing	16.5	12.3	12.4	11.7	11.7	14.3	16.9	16.8

[a] Included in electrical and mechanical engineering.

Source: Statistisches Bundesamt, Fachserie G, Reihe 7, var. iss.

Table 11 - Share of Imports from Developing Countries in Total Imports by Industry, Federal Republic of Germany, 1962 - 1976 (p.c.)

Industry \ Year	1962	1970	1971	1972	1973	1974	1975	1976
Primary and intermediate goods ind.	11.4	7.3	5.8	5.0	5.5	6.0	4.8	5.4
Stones and earthen goods ind.	5.0	2.9	3.0	2.4	2.3	2.3	2.9	2.5
Iron and steel ind.	0.1	1.0	0.7	1,2	2.2	1.7	1.4	2.2
Foundries	0.0	1.0	0.9	0.9	0.4	0.5	0.7	1.9
Cold rolling mills	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
Non-ferrous metal ind.	27.8	22.2	20.6	17.3	15.8	18.4	15.2	14.9
Mineral oil ind.	33.5	2.5	1.9	2.1	3.6	6.4	5.6	7.3
Chemical ind.	3.7	2.2	2.6	2.4	2.8	2.7	2.5	2.3
Sawmills and woodwork ind.	7.3	10.8	13.2	13.4	17.8	13.5	15.3	17.9
Pulp, paper, paper board ind.	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.6
Rubber and asbestos man. ind.	3.0	1.3	1.4	1.1	1.0	1.7	2.0	2.7
Capital goods ind.	0.3	0.8	1.1	1.2	1.9	2.7	3.4	3.5
Structural and light metal eng.	0.0	0.1	0.1	1.5	0.4	0.1	0.1	0.1
Mechanical engineering	0.1	0.4	0.3	0.4	0.5	0.6	0.8	1.0
Man. of road vehicles	0.0	0.4	0.5	0.5	0.8	1.8	2.0	1.8
Shipbuilding	0.3	0.1	8.1	0.6	0.3	4.5	5.9	2.6
Aircraft man.	1.9	0.3	0.6	0.6	1.3	2.0	2.6	1.0
Electrical engineering	0.3	1.6	1.7	2.4	3.4	4.5	5.4	6.7
Precision and optical goods, watches	0.5	0.9	1.4	2.9	3.6	5.6	6.3	6.2
Steel processing	0.1	0.1	0.5	0.9	1.2	1.5	2.2	2.8
Iron, sheet and metal goods ind.	1.2	0.9	1.2	1.4	1.8	2.5	3.3	3.9
Office machines and data proc.	.[a]	0.8	1.0	1.0	3.3	3.1	6.5	5.2
Consumer goods ind.	9.9	10.6	10.9	11.5	13.1	13.9	15.5	17.9
Fine ceramics ind.	0.4	0.3	0.2	0.6	1.5	2.2	2.7	3.5
Glass and glass prod. ind.	0.1	0.3	0.3	0.9	0.7	0.8	1.3	1.6
Woodwork man. ind.	6.9	5.8	5.5	5.4	5.3	6.6	6.6	7.1
Musical instr., toys, sport.goods ind.	9.7	13.7	13.5	14.5	16.9	16.9	19.5	22.3
Pulp and paper man. ind.	0.2	0.5	0.6	0.7	1.6	0.9	1.1	2.8
Printing and publishing	0.5	0.9	1.2	1.1	0.7	0.8	0.9	1.0
Plastics prod. ind.	2.8	1.7	2.4	2.8	2.8	2.5	2.8	3.2
Leather ind.	12.9	18.4	16.9	19.2	22.0	14.4	13.8	17.5
Leather man. ind.	11.4	21.1	24.0	26.1	34.7	32.8	30.9	35.3
Shoe ind.	0.9	3.9	3.9	3.9	4.3	5.2	5.2	6.9
Textile ind.	11.2	12.7	13.1	12.9	14.1	13.6	15.2	17.5
Clothing ind.	14.1	15.8	16.2	18.6	22.3	26.9	30.1	34.3
Food, beverages, tobacco	22.1	20.6	19.7	19.3	18.4	16.2	14.6	14.5
Manufacturing	10.2	7.4	6.9	7.0	7.6	7.9	7.7	8.4

[a]Included in electrical and mechanical engineering.

Source: Statistisches Bundesamt, Fachserie G, Reihe 7, var. iss.

which continued is almost exclusively attributable to the declining weight of a number of primary and intermediate goods and the food industries. However, on the whole, by 1976 developing countries played an important role for trade of the Federal Republic of Germany in quite a number of industries (tables 10 and 11).

(a) Developing countries' share in exports by industry exceeded 15 per cent in the following cases:
-stones and earthern goods industries,
-foundries,
-chemical industry,
-structural and light metal engineering,
-mechanical engineering,
-manufacture of road vehicles,
-ship building,
-electrical engineering.

(b) Developing countries' share in imports by industry exceeded 15 per cent in the following cases:
-sawmills and wood work industry,
-musical instruments, toys and sporting goods industry,
-leather industry,
-leather manufacturing industry,
-textile industry,
-clothing industry.

These same industries rank highest in terms of shares of imports from developing countries in domestic apparent consumption in the Federal Republic of Germany. For musical instruments, leather and clothing this share already exceeds 10 per cent (table 12). Although the bulk of imports from developing countries still consists of products in which competition from the developing countries has been felt for a long time, the highest growth rates in the 1970s were in non-traditional areas, such as precision and optical goods, electrical engineering, and office machines.

Table 12- Share of Total Imports and Imports from Developing Countries in Domestic Apparent Consumption by Industry, Federal Republic of Germany, 1962-1976 (p.c.)

Industry \ Year	Total Imports in p.c. of Domestic Apparent Consumption				Imports from Developing Countries in p.c. of Domestic Apparent Consumption			
	1962	1970	1975	1976	1962	1970	1975	1976
Primary and intermediate goods ind.	15.0	21.1	23.8	25.4	1.7	1.5	1.1	0.9
Stones and earthen goods ind.	7.6	9.5	11.4	11.7	0.4	0.3	0.3	0.3
Iron and steel ind.	14.4	20.1	24.0	25.7	0.0	0.2	0.3	0.6
Foundries	1.9	2.8	5.2	4.8	0.0	0.0	0.0	0.0
Cold rolling mills	3.4	10.7	16.5	16.4	0.0	0.0	0.0	0.0
Non-ferrous metal ind.	40.6	49.8	43.0	44.6	12.6	12.3	7.4	6.6
Mineral oil ind.	12.2	12.5	23.7	25.2	4.1	0.3	1.3	1.9
Chemical ind.	11.6	19.6	21.8	23.5	0.4	0.4	0.6	0.5
Sawmills and woodwork ind.	26.2	27.5	25.0	28.8	1.9	3.0	3.8	5.2
Pulp, paper, paperboard ind.	28.3	38.9	44.3	45.7	0.0	0.1	0.1	0.3
Rubber and asbestos man. ind.	8.3	14.6	23.5	22.9	0.2	0.2	0.5	0.6
Capital goods ind.	8.4	15.4	19.1	21.1	0.0	0.1	0.6	0.7
Structural and light metal eng.	1.7	3.6	4.9	5.7	0.0	0.0	0.0	0.0
Mechanical engineering	13.4	18.7	19.3	19.2	0.0	0.1	0.2	0.2
Man. of road vehicles	6.9	17.1	22.3	23.7	0.0	0.1	0.5	0.4
Shipbuilding	4.0	22.6	14.1	22.4	0.0	0.0	0.8	0.6
Aircraft man.	52.5	56.0	63.3	96.4	1.0	0.2	1.6	1.0
Electrical engineering	6.5	12.9	17.1	18.5	0.0	0.2	0.9	1.2
Precision and optical goods, watches	15.4	27.3	34.6	38.3	0.1	0.3	2.2	2.4
Steel processing	3.0	4.7	6.6	7.3	0.0	0.0	0.1	0.2
Iron, sheet and metal goods ind.	5.3	9.9	13.2	13.9	0.1	0.1	0.4	0.5
Office machines and data proc.	.[a]	52.1	75.1	85.9	.[a]	0.4	4.9	4.5
Consumer goods ind.	9.9	15.8	22.7	24.4	1.0	1.7	3.5	4.4
Fine ceramics ind.	6.9	17.7	27.7	29.7	0.0	0.0	0.8	1.0
Glass and glass prod. ind.	5.9	14.9	16.9	19.7	0.0	0.0	0.2	0.3
Woodwork man. ind.	4.2	5.6	9.3	10.0	0.3	0.3	0.6	0.7
Musical instr., toys, sport. goods ind.	26.6	42.3	50.7	55.0	2.6	5.8	9.9	12.3
Pulp and paper man. ind.	2.5	4.6	8.0	7.7	0.0	0.0	0.1	0.2
Printing and publishing	3.1	4.3	4.7	4.7	0.0	0.0	0.0	0.0
Plastics prod. ind.	3.6	12.7	15.7	16.3	0.1	0.2	0.4	0.5
Leather ind.	19.8	41.8	57.3	58.9	2.6	7.7	7.9	10.3
Leather man. ind.	5.8	14.5	26.0	28.1	0.7	3.1	8.1	9.9
Shoe ind.	7.6	21.4	36.9	39.6	0.1	0.8	1.8	2.7
Textile ind.	17.5	24.7	35.5	38.4	2.0	3.1	5.4	6.7
Clothing ind.	5.9	14.9	29.9	32.9	0.8	2.4	9.0	11.3
Food, beverages, tobacco	9.8	12.4	14.1	9.4	2.2	2.6	2.1	1.4
Manufacturing	11.0	16.9	20.5	22.2	1.1	1.2	1.6	1.9

[a] Including in mechanical and electrical engineering.

Source: Statistisches Bundesamt, Statistisches Jahrbuch, var. iss. - Idem, Fachserie G, Reihe 7, var. iss.

As one of the most developed countries in the world market economy, the relative abundance of highly skilled managers, research and development personnel and qualified production workers are the most important assets of the Federal Republic of Germany in her trade with the Third World. Likewise, almost by definition, physical capital is an abundant factor of production. Since energy is an important input, energy supply and price has become a matter of top concern in the Federal Republic of Germany, as in other industrialized countries. Even though highly subsidized, energy production from domestic sources has never met domestic energy consumption. This situation is not likely to change in the near future since there is a strong movement in the Federal Republic of Germany against the establishment of new nuclear power plants (which, by the way, also depend on foreign inputs). Nevertheless, the presence of a highly developed energy generation and distribution system may still account for a relatively cheap supply.

In contrast to some other highly developed countries, natural resources endowment in the Federal Republic of Germany is relatively poor. Some minor deposits of iron ore, oil, natural gas and salt, forests and the coal deposits of the Ruhr area, Aachen and the Saar have been the only major domestic natural resources available to industry in the Federal Republic; but even the latter have become less and less competitive by international standards. Despite the elastic supply of foreign workers on the Federal Republic labour market, unskilled labour constitutes comparatively the scarcest factor of production. Finally, in the Federal Republic of Germany, as in other industrialized countries, the environment is increasingly a matter of concern. This is reflected by an increasing number of laws coercing producers and consumers to pay for the costs of environmental pollution.

Table 13 gives empirical data on the factor intensities - the structural characteristics - for 33 industries in the Federal Republic. In general, the indicators are calculated for the year 1975 or the most recent year for which data were available (Column 1 provides weights -gross value added 1976 in 1970 prices- for purposes of aggregation). Since the ranking of the individual industries by their factor intensities is rather stable over time, the figures given can be assumed to be by and large representative for the whole 1970s.

Table 13 - Structural Characteristics of Industries in the Federal Republic of Germany

Industry	Weight	Research and Development Intensity			Raw material intensity[a], 1970 (p.c.)	Environment intensity[b], 1971-1975 (p.c.)	Energy intensity, Electric power consumption per hour worked, 1976 (KW/h)
	Gross value added in 1970 prices (Mio.DM)	R & D expenditures in p. c. of sales, 1975	R & D expenditures per employee 1975 (Thsd.DM)	Scientists, engineers and technicians in per cent of total employment, 1975			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Stones and earthen goods ind.	9901	0,7	0,85	0,92	2,31	10,2	17,5
Iron and steel ind.[g]	13178	0,4	0,57	0,53	23,97	9,4	37,8
Foundries	3066	.	.	.	2,56	7,9	12,7
Cold rolling mills	2757	.	.	.	0,10[h]	1,8	10,5
Non-ferrous metal ind.	4640	1,0	1,59	1,48	20,36	8,5	77,7
Mineral oil ind.	11902	0,2	3,02	2,59	64,96	17,5	89,9
Chemical ind.	43269	4,8	6,52	4,83	17,37	11,1	41,5
Sawmills and woodwork ind.[i]	2962	0,4[i]	0,29[i]	0,31[i]	15,24[i]	4,7	11,5
Pulp, paper, paper board ind.[k]	3362	.	.	.	2,06[k]	10,1	67,7
Rubber and asbestos man. ind.[l]	4416	2,3	1,78	1,64	6,87[l]	2,0	8,7
Structural and light metal eng.	7047	.	.	.	0,11	0,3	1,5
Mechanical engineering	33687	3,1	2,74	2.64	0,79	1,4	2,7
Man. of road vehicles[m]	26702	2,9	3,50	1,82	0,22[m]	2,1	6,6
Shipbuilding	2593	.	.		m	0,5	3,5
Aircraft man.	1400	44,0	33,19	34,34	m	1,4	2,8
Electrical engineering	38882	6,7	5,30	5,68	0,29	2,0	3,1
Precision and optical goods, watches	4204	4,5	3,38	4,13	0,13	1,5	1,9
Steel processing[n]	5225	.	.	.	h	3,3	5,9
Iron, sheet and metal goods ind.[o]	15006	1,0	0,74	0,96	0,18[o]	2,2	3,5
Office machines and data proc.	2927	.	.	.	0,10	1,0	4,2
Fine ceramics ind.[p]	2028	2,1[p]	1,18[p]	1,39[p]	0,46[p]	3,3	5,5
Glass and glass prod. ind.	4366	p	p	p	p	1,6	13,8
Woodwork man. ind.	9292	i	i	i	i	2,7	2,9
Musical instr., toys, sport.goods ind.	1572	.	.	.	o	2,2	1,9
Pulp and paper man. ind.[q]	4493	0,8[q]	0,93[q]	0,94[q]	k	1,2	6,2
Printing and publishing	8469	q	q	q	0,05	1,4	3,0
Plastics prod. ind.	8181	1,7	1,41	1,79	l	3,6	8,2
Leather ind.[r,s]	430	1,7[r]	1,19[r]	1,12[r]	2,09[s]	3,2	5,5
Leather man. ind.	820	r	r	r	s	0,4	0,7
Shoe ind.	1215	r	r	r	s	0,3	1,2
Textile ind.	13864	0,4	0,33	0,38	14,18	1,3	7,4
Clothing ind.	6780	r	r	r	5,12	0,3	0,8
Food, beverages, tobacco	36987	0,3	0,72	0,83	106,40	3,3	7,2
Manufacturing	335623	2,9	3,41	3,02	19,54	5,2	11,2

Table 13 - continued

Industry	Human capital per hour worked[a], 1975 (DM)	Unskilled labour in p. c. of total employees[d], 1974	Craftsmen in p. c. of total employees[e], 1974	Capital stock in 1970 prices per hour worked, 1975 (DM)	Effective rate of tariff protection, 1974 (p.c.)	Effective rate of domestic protection, 1974 (p.c.)	Effective rate of total assistance, 1974 (p.c.)	Scale economies indicator[f], 1974 (p.c.)
	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Stones and earthen goods ind.	34,39	46,31	31,10	64,74	3,7	1,1	4,9	13,1
Iron and steel ind.[c]	63,19	50,22[a]	28,64[a]	75,19	17,0	0,9	18,2	94,3
Foundries	49,35	a	a	37,22	12,1	0,8	13,2	61,0
Cold rolling mills	42,14	a	a	44,50	7,7[h]	0,7[h]	8,5[h]	47,9
Non-ferrous metal ind.	46,90	51,67	25,71	59,15	22,5	2,4	26,1	75,5
Mineral oil ind.	102,92	18,25	34,03	265,98	6,5	5,6	12,9	62,0
Chemical ind.	83,12	40,42	19,09	78,74	14,4	2,5	17,7	74,2
Sawmills and woodwork ind.[i]	26,34	49,03	30,84	49,46	13,7	1,9	16,1	16,2
Pulp, paper, paper board ind.[k]	51,94	50,28	29,07	96,63	29,6	1,2	31,6	52,6
Rubber and asbestos man.ind.[l]	52,76	55,09	21,65	39,90	8,7	0,7	9,6	74,6
Structural and light metal eng.	51,70	24,92	47,46	16,73	1,4	1,6	3,1	37,7
Mechanical engineering	53,99	28,74	38,13	26,16	2,5	1,4	4,4	54,4
Man.of road vehicles[m]	69,75	35,91	43,76	49,47	5,8	0,9	6,9	90,4
Shipbuilding	68,48	14,71	64,37	31,43	- 10,1	11,1	- 1,2	80,2
Aircraft man.	84,27	13,50	41,78	22,49	- 0,9	59,2	56,9	90,2
Electrical engineering	59,58	46,35	21,67	26,55	4,5	3,5	8,4	71,3
Precision and optical goods, watches	48,62	46,98	23,78	19,86	4,5	2,0	6,7	50,0
Steel processing[n]	39,52[n]	54,33[n]	22,99[n]	26,46[n]	h	h	h	24,7
Iron, sheet and metal goods ind.[o]	n	n	n	n	5,6	1,3	7,0	30,3
Office machines and data proc.	95,03	38,37	16,00	42,65	.	.	.	82,4
Fine ceramics ind.[p]	34,19	64,41	17,51	25,86	9,9	1,2	11,4	61,2
Glass and glass prod.ind.	47,35	54,26	26,89	39,75	11,1	1,1	12,5	57,6
Woodwork man. ind.	34,14	44,64	34,08	22,35	9,9	0,7	10,8	17,3
Musical instr., toys, sport. goods ind.	30,05	57,32	20,00	19,28	6,9	1,1	8,2	1,0
Pulp and paper man.ind.[q]	36,33	60,17	17,68	32,31	19,9	1,4	21,9	2,3
Printing and publishing	40,43	34,05	43,46	32,52	5,3	4,7	10,6	18,2[u]
Plastics prod.ind.	37,48	58,28	18,25	30,44	9,8	1,7	11,9	23,6
Leather ind.[r,s]	25,54	56,49	24,74	52,53	9,9[s]	0,5[s]	10,6[s]	7,0[u]
Leather man. ind.	21,12	63,45	16,94	12,06	s	s	s	5,2
Shoe ind.	33,42	58,74	25,24	19,24	s	s	s	24,5
Textile ind.	32,28	59,73	19,35	42,69	20,8	1,4	22,8	35,1
Clothing ind.	15,90	65,96	17,14	13,02	20,7	11,8	23,4	7,3
Food, beverages, tobacco	32,61	44,99	24,65	66,25	.	.	.	30,9
Manufacturing	50,42	44,37	28,45	41,24	9,1	2,5	11,7	52,9

[a] Input-Output Table 1970, sum of rows 1, 2, 3, 7, 8, 10 in p.c. of gross value added (row 67). - [b] Investment in environmental protection in p.c. of total investment 1971 - 1975. - [c] For measurement concept see Fels, 1974. - [d] Wage groups 2, 3 (blue collar workers) and V (white collar workers) in p.c. of total employees. - [e] Employees in plants with 500 or more employees in p.c. of total employment. - [f] Iron and steel, foundries, cold rolling mills. - [h] Cold rolling mills, steel processing. - [i] Sawmills, woodwork and woodwork man. - [k] Pulp and paperboard, pulp and paper man. - [l] Gummi and asbestos, plastics. - [m] Road vehicles, shipbuilding, aircraft man., steel processing. - [n] Steel proc., iron, sheet and metal goods. - [o] Iron, sheet and metal goods, musical instr. - [p] Fine ceramics, glass. - [q] Pulp and paper man., printing and publishing. - [r] Leather, leather man., shoes, clothing. - [s] Leather, leather man., shoes.

Source: R. Krengel et.al., Produktionsvolumen und -potential, Produktionsfaktoren der Industrie im Gebiet der Bundesrepublik Deutschland einschl. Saarland und Berlin (West). Statistische Kennziffern, Berlin, var. iss. - H. Mai, Input-Output-Tabelle 1970. "Wirtschaft und Statistik", Stuttgart and Mainz, 1974, No. 3. - H. Pichterhoff-Severitt, Forschung und Entwicklung (FuE) in der Wirtschaft 1975. Beilage zu "Wirtschaft und Wissenschaft", Heft 4/1977. Essen, December 1977. - Statistisches Bundesamt, Fachserie M, Reihe 15. Stuttgart und Mainz, var. iss. - W. Ochel, Die Industrialisierung der Dritten Welt, insbesondere der OPEC-Länder und ihre Folgen für die Bundesrepublik Deutschland. Ifo-Schnelldienst 11-12/1977. München, 1977. - J.B. Donges, A.D. Neu, G. Fels, Protektion und Branchenstruktur der westdeutschen Wirtschaft. Kieler Studien, No. 123, Tübingen 1973. - K.-H. Jüttemeier, K. Lammers, K.-W. Schatz und F. Willms, Auswirkungen der öffentlichen Haushalte auf sektorale Investitionsentscheidungen im Industrie- und Dienstleistungsbereich. Kiel, 1978 (mimeo.).

The indicators were constructed as follows:

RDI Research and development intensity alternatively measured as

(i) R+D expenditures in per cent of sales in 1975 (RD1, column 2);

(ii) R+D expenditures per employee in 1975 (RD2, column 3); and

(iii) scientists, engineers and technicans engaged in R+D in per cent of total employment in 1975 (RD3, column 4).

Research and development intensity which is measured by these three concepts serves as a proxy for interindustrial differences in innovativeness. It is obvious that this indicator has severe shortcomings, since input figures are taken to measure differences in output. Of course, the efficiency of research and development investment or research and development personnel may vary significantly across industries. For the time being, such deficiencies have to be tolerated as systematic information on innovativeness are not available. Similar criticism applies to the proxy for environment intensity.

RMI Raw material intensity measured as inputs from forestry, fishery, agriculture and mining in per cent of value added at factor cost in 1970;

Raw material intensity as well as energy intensity are measured to cover only direct inputs.

EVI Environment intensity measured as investment in environmental protection as a share of total investment during the period 1971-1975;

ENI Energy intensity as measured by energy input per hour worked in 1976;

HCI Human capital intensity as measured by the capitalized difference between industry-specific actual average hourly wages and industry-specific unskilled workers wages in 1975;

The relative absorption of qualified labour by industry is measured by two concepts. The human capital indicator provides information about the average absorption of qualified labour based on the hypothesis that differences between hourly wages

and industry-specific wages for unskilled labour can be regarded as the cost of human capital. It should be noted that interindustrial differences in wages for unskilled labour can be assumed to reflect interindustrial differences in the disutility of labour. However, being an average figure, the human capital indicator for two industries may be the same although the skill structure in these industries differs significantly; e.g., industry A, employing only medium skills, may show the same human capital intensity as industry B where the skill structure is some mixture of highly skilled and unskilled employees. It is obvious that under certain conditions the economic consequences of these differing skill structures may be quite disparate. To account for this, figures given in column (9) and (10) provide information on interindustrial differences in skill structures; craftsmen may be taken to represent medium skills.

RCI Raw labour intensity (low skills) as measured by the share of employees belonging either to the two lowest skill classes of manual workers or to the lowest skill class of white collar workers in per cent of total employment in 1974.

CMI Craftsmen intensity as measured by the share of employees belonging to the highest skill class of manual workers in per cent of total employment in 1974.

PCI Physical capital intensity as measured by the value of gross fixed capital stock in 1970 prices per hours worked in 1975.

ETP Effective rate of tariff protection in 1974.

EDP Effective rate of domestic protection in 1974.

Effective rates of protection, as given in columns (12)-(14), yield information about the allocative effects of government policies. For each industry these rates show by how many per cent value added at domestic prices is higher (or lower) due to government inverventionl/ than value added at world market prices. Column (12) provides information for the tariff system of the Federal

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1/ For the many theoretical and empirical difficulties involved in this concept see Corden (1971), Donges et al. (1973).

Republic of Germany, while calculations given in column (13) reflect the impact of government subsidies, tax preferences etc.[1/] on the allocation of resources. In column (14) both effects are combined. To put it differently: According to the calculations, in 1974, value added in the steel industry of the Federal Republic of Germany was 17 per cent higher than it would have been in a free trade situation, due to Federal Republic tariffs on steel inputs and outputs; subsidies, tax preferences etc. for steel inputs and outputs effects 0.9 per cent increase of value added in the steel industry, an increase that would not have occurred in the absence of such government interventions.

SCE Scale economies as measured by the share of employment in establishments engaging 500 or more employees in total industry employment in 1974.

Table 13 reveals a wide variety of factor intensities across industries of the Federal Republic of Germany. Typically, research and development plays a particularly important role in most capital goods industries, while it is of minor importance in most consumer goods, primary, and intermediate goods industries. Within the primary and intermediate goods sector, however, chemicals constitute an important exception. Most capital goods industries belong to the human capital or skill intensive sector of industries in the Federal Republic of Germany, while consumer goods industries are generally characterized by a relatively high degree of unskilled labour. For primary and intermediate goods industries the picture is somewhat mixed, since this sector includes the bulk of raw material and energy intensive industries and all industries with an above average environment intensity. Economies of scale seem to play a significant role in most manufacturing industries, with the exception of the consumer goods sector.

1/ For details see Jüttemeier et al. (1978).

Government policies have influenced the value added of all industries. Generally, within manufacturing the system of tariffs has had a larger impact than subsidies and tax preferences (aircraft building is, however, a major exception). Apart from shipbuilding, all domestic manufacturing industries have benefitted from the system of protection, but to varying degrees. Taking the effective rate of total assistance for manufacturing as a dividing line, with the exception mentioned above, capital goods industries are discriminated against; stone and earthern goods, cold rolling mills, rubber and asbestos manufacturing, fine ceramics, wood processing, musical instruments, toys and sporting goods, printing and publishing, and leather constitute the other industries with a below average effective rate of total assistance. It goes without saying that factor intensities as well as effective rates of protection may vary substantially within each of the 33 manufacturing industries.

This table of structural characteristics will be used to test the power of four trade models to explain the commodity composition of the trade of the Federal Republic of Germany with developing countries (Leontieff 1953, 1956).

(a) Model I is a human capital approach. It posits that the Federal Republic of Germany's industries competitiveness in trade with developing countries is positively correlated with human and physical capital intensity (Becker 1962).

(b) Model II differs from model I in that the aggregate human capital proxy is substituted by skill indicators (human skill approach). With regard to these variables it is expected that the lower the Federal Republic of Germany's industries' competitiveness in trade with developing countries, is, the higher the share of unskilled and medium skilled workers in total employment (Kenen 1965; 1970; Krueger, 1970).

(c) Model III constitutes an "availability" approach. For this approach model II is enlarged to include raw material intensity,

environment intensity and energy intensity as additional determinants of location. It is suggested that the two former factors correlate negatively and the latter factor positively with competitiveness (Kravis, 1956; Vanek, 1963).

(d) While models I to III are based on factor endowment considerations, model IV takes into account technological factors. Here, it is assumed that the competitive edge of the Federal Republic of Germany is based on its relatively large research and development capacities, as well as on her large domestic market; on the other hand, industries producing standardized commodities are expected to suffer from comparative disadvantages (Posner, 1961).

In all four models, the effective rate of total assistance is incorporated to measure the effect of government policies on the Federal Republic of Germany's industries' international competitiveness. The competitiveness of highly protected industries can be supposed to be better than it would be in the absence of government intervention.

In order to measure interindustrial differences in international competitiveness, the concept of "revealed" comparative advantage was applied (Balassa, 1965) (See Appendix 1 for calculation procedures).

Regressions were run for the manufacturing trade of the Federal Republic of Germany with developing ocuntries in the year 1970, 1975, and 1976 (table 23 in Appendix 1). Depending on the availability of relevant data the number of observations ranges between 18 and 31 for the various trade models The results of the regression analyses are presented in table A.1.1 Appendix 1). The most remarkable observations, which by and large, are the same for all years under investigation, may be summarized as follows:

(a) It is obvious that each of the four models yield explanatory power, in most cases at high levels of significance. As measured by R^2 adjusted, the "availability" approach is the model with highest explanatory power.

(b) Craftsmen intensity (exception: "availability" approach in 1970) and environment intensity fail to show significant influence on the structure of revealed comparative advantage in manufacturing trade with developing countries.

(c) Human capital intensity, research and development intensity, energy intensity and economies of scale consistently establish the Federal Republic industries' competitive edge in trade with developing countries.

(d) Industrial activities characterized by unskilled labour intensity, raw material intensity or a high degree of standardization are under adjustment pressure from import competition from the developing countries.

(e) Although significant, physical capital intensity and the effective rate of total assistance fail to account for comparative advantage.

As for the last point, these results confirm earlier findings (Fels, 1974; Wolter, 1977). With respect to physical capital the explanation may run along three lines. First, as an internationally relatively mobile factor, capital must not be employed or establish a comparative advantage where it is accumulated. Second, policy distortions may have provoked a bias towards physical capital intensive production structures in many developing countries (Donges, 1976). And third, physical intensity may characterize industries producing commodities which are not viable in the most advanced countries according to the product cycle hypothesis.[1/] The findings for the effective rate of total assistance show that governments tend to minimize short-run labour adjustment costs (Cheh, 1974; Riedel, 1977).

Developing countries differ greatly in factor endowments, preferences, government policies etc. Hence, the nature of the division of labour of the Federal Republic of Germany with individual developing countries

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1/ The introduction of physical capital intensity as a proxy for the degree of standardization is based on this notion.

may differ significantly from the average pattern. In cases where trade relations are still in their infancy, trade patterns may reveal no systematic features. While it is outside the scope of this study to analyse trade of the Federal Republic of Germany with the Third World on a country by country base, it was possible to extend the analysis to major groups of developing countries. The results of this effort are presented in tables A.1.2, A.1.3, A.1.4 in Appendix 1. An inspection of the estimates reveals that again most models yield significant results. In all cases, the availability approach and the technology approach seem to be better suited for explaining trade patterns than the human capital or skill approaches. Moreover, the direction in which the various (significant) determinants influence trade patterns are in accordance with out earlier findings.[1/]

The results of these analyses strongly suggest that the longer-term comparative advantage of the Federal Republic of Germany in trade with developing (and semi-industrial) countries is essentially confined to the range of skill-intensive or research and development intensive lines of production.[2/] This is not to say that all standardized production processes will be put under adjustment pressure at the same time and to the same degree. Factors such as transport cost differentials, differentials in tariff and non-tariff barriers to trade, differentials in the relevance of industrial complexes for the various industries (and changes in these factors) are important determinants of the speed and extent of structural adjustment.[3/] Also, the length of the imitation lag varies across industries. Even for a given industry it is extremely

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1/ There is only one exception discernible. In the 1970 estimates for Africa, physical capital intensity turns up with a positive sign in model III. While this result is in contradiction to the estimate for model I, it may be explained by the fact that among the groups investigated developing Africa has still the lowest level of development and little access to capital markets.

2/ For all estimates presented, the coefficients of determination indicate a larger or smaller degree of unexplained residuals. While this results is not uncommon for cross industry analyses it must remain an open question whether this is due to random variation or whether important determinants of trade patterns have been omitted.

3/ A yet unsettled question in this context is also to what extent within a particular industry research and development intensive or skill intensive activities are complementary to unskilled labour intensive activities (e.g. research and development departments or headquarter activities on the one hand and assembly lines on the other hand in an automobile factory). Obviously, different industries can physically separate the various stages of the production process at widely different costs.

difficult to predict how long the lag is. Given the relevant factor intensities, most consumer goods industries and some primary and intermediate goods industries are the most likely to come under increasing import competition from developing countries. (But it should be stressed once again that within each of the industries listed in table 13, production functions differ from sub-branch to sub-branch.) Part of the adjustment process may simply involve continuous up-grading in quality or continuous product differentiation. Hence, industries under adjustment pressure may be able to restructure at their original locations, rather than having to entirely relocate to developing countries.

IV. Future Developments

While in the preceding section the focus has been on the division of labour with the developing countries, an assessment of future development prospects has to take a broader view. Thus this chapter begins with an investigation into the relative importance of various sources of recent employment changes in the manufacturing sector of the Federal Republic of Germany. Subsequently, projections of future developments are presented.

Changes in the international division of labour reflected in the increasing competition from low-wage countries on the world markets and on the domestic markets of the Federal Republic of Germany for manufactures, are not the only causes of structural change. Government policies have significantly influenced relative price structures in various ways and, thereby, have impeded (or provoked) structural changes which otherwise would not (or not at that time) have taken place. In addition, the manifold changes in the structure of production and employment which the Federal Republic has experienced since the 1950s reflect profound changes in the structure of demand and in technology. To assess precisely the relative weight of each of these factors is extremely difficult since the determinants of structural change are closely linked. Table 14 gives rough orders of magnitude for recent changes in employment which are due to changes either in (domestic) consumption, foreign trade and/or productivity.[1/] (See Appendix 2 for calculation procedure.)

(a) First of all, it is evident that all industries except plastics have displaced labour during the period under investigation. Total employment losses for manufacturing account for about 15 per cent of the 1970 level of employment. Partly, this may be attributed to a lower rate of capacity utilization in 1976, as compared to 1970. Partly, this reflects structural changes among manufacturing industries and services.

1/ For 1962 and 1976 patterns of production, domestic apparent consumption, exports and imports for manufacturing in the Federal Republic of Germany, see table A 3.

Table 14 - Sources of Employment Changes by Industry,[a] Federal Republic of Germany, 1970-1976 (Employees)

Industry	Employment in 1970 (1)	Change in Employment 1970-1976 (2)	Change in Consumption[c] 1970-1976 (3)	Due to Change in Exports[b] 1970-1976 (4)	Due to Change in Imports[b] 1970-1976 (5)	Change in Productivity 1970-1976 (6)
Stones and earthen goods ind.	231881	- 46506	- 6283	8226	- 2322	- 46127
Iron and steel ind.	334594	- 33077	- 39609	34726	- 10729	- 17465
Foundries	125375	- 30704	- 27014	4779	- 1843	- 6626
Cold rolling mills	71586	- 12256	- 6934	6645	- 2917	- 9050
Non-ferrous metal ind.	124880	- 15335	38523	24084	312	- 78254
Mineral oil ind.	35344	- 5587	977	- 608	- 1781	- 4175
Chemical ind.	599641	- 25765	168788	97579	- 56227	-235905
Sawmills and woodwork ind.	69847	- 11503	8981	3248	- 137	- 23595
Pulp, paper, paperboard ind.	76239	- 21580	6789	8249	- 6197	- 30421
Rubber and asbestos man. ind.	140281	- 26767	- 15559	18298	- 14607	- 14899
Structural and light metal eng.	204084	- 17545	1484	20842	- 4889	- 34982
Mechanical engineering	1119838	-117550	- 75770	154738	- 23093	-173425
Man. of road vehicles	606162	- 18622	65287	103795	- 47324	-140380
Electrical engineering	1094532	-129989	237934	182038	-131994	-417967
Precision and optical goods, watches	168502	- 22919	43234	12275	- 35251	- 43177
Iron, sheet and metal goods ind.	418235	- 65153	26460	2187	- 20814	- 72986
Fine ceramics ind.	79009	- 14403	12617	2097	- 12944	- 16173
Glass and glass prod. ind.	95083	- 17277	10092	4511	- 6778	- 25102
Woodwork man. ind.	223314	- 7842	51829	18266	- 11308	- 66629
Musical instr., toys, sport. goods ind.	59888	- 10344	- 1320	7496	- 7549	- 8971
Pulp and paper man. ind.	136821	- 21707	48182	7764	- 5994	- 71659
Printing and publishing	224169	- 34575	5792	5414	- 1584	- 44197
Plastics prod. ind.	167331	12047	80508	26974	- 19733	- 75702
Leather ind.	14428	- 6506	- 955	35	- 1803	- 3783
Leather man. ind.	39960	- 8703	1221	407	- 6701	- 3630
Shoe ind.	89404	- 34424	- 8310	2355	- 17865	- 10604
Textile ind.	501456	-159749	- 57147	73972	- 58115	-100459
Clothing ind.	379067	-102467	39640	32600	- 80308	- 94399
Food, beverages, tobacco	514502	- 66434	81019	28050	- 25729	-149774

[a] Using definition (7) - see Appendix 2 - [b] In 1970 prices. - [c] Apparent Consumption.

Source: Statistisches Bundesamt, Fachserie D, Reihe 1, var. iss. - Fachserie G, Reihe 7, var. iss. - R. Krengel et al., Produktionsvolumen und -potential. Produktionsfaktoren der Industrie im Gebiet der Bundesrepublik Deutschland einschl. Saarland und Berlin (West). Statistische Kennziffern, Berlin, var. iss.

Since estimates of the competitive capital stock are not presently available it cannot be determined to what extent labour displacement is due to structural factors.

(b) In the vast majority of all industries, increases in labour productivity are by far the most important source of labour displacement. Imports are only a secondary cause for displacements (25 per cent of gross displacement in manufacturing). Certain industries, however, have also suffered from decreasing (real) domestic demand, notably in the steel sector.

(c) As for positive employment effects, all branches except the mineral oil industry have benefitted from real exports increases. However, in many cases increases in domestic demand have been a significantly more important source of additional employment.

(d) It is interesting to note that in the majority of cases positive employment effects due to increasing exports outweighed by far the negative employment effects due to increasing imports. Exceptions to this rule are the mineral oil industry, the precision, optical goods and watches industry, the iron, sheet and metal goods industries, the fine ceramics industry, the glass industry, the muscial instruments etc. industry, the leather and shoe industries and the clothing industry.

On the whole, the calculations clearly seem to reveal that foreign trade has had a positive influence on employment in manufacturing in the Federal Republic of Germany during a period in which overall employment in manufacturing heavily decreased. However, at least to the extent that these positive employment effects are due to rising exports relative

to imports in trade with the developing countries, it remains an open question whether they reflect a transfer of real resources to the petroleum producing countries as a consequence of oil price rises.

Table 15 disaggregates the employment effects of foreign trade according to major trading regions. As can be seen both positive and negative employment effects of foreign trade are mainly attributable to trade with more developed countries. For all regions, positive employment effects outweigh negative employment effects for most branches. The exceptions are mainly in the consumer goods sector. The relatively large, absolute employment effects seem to indicate that foreign trade has provoked substantial inter-firm and inter-branch migration.

It has to be kept in mind, however, that the model applied rests on some rigid assumptions. Thus, one has to presume that positive employment effects by exports are overestimated while negative effects by imports are underestimated. Most likely, marginal labour productivity in export industries is above, and in industries where imports are increasing below the manufacting average. Nonetheless technological changes have been a more important source of direct displacements than international trade.

At the end of the 1970s, an assessment of the extent and nature of structural changes and future growth in the Federal Republic of Germany, seems to be much more difficult than it was at the end of the sixties. The Federal Republic of Germany is facing a number of abrupt and drastic changes in overall economic conditions, and adjustments to these changes are far from being accomplished. The persistently high level of unemployment - in spite of the considerable recovery from the 1974/75 recession - is only one outstanding indicator. With regard to structural changes and technological changes the focus of attention is on displacement effects rather than on new job opportunities. In the current debate foreign competition is very often regarded as an important cause of domestic unemployment and scarcely as a source of cheap supply. Efforts are being concentrated on defending income positions by protectionism (in a broad sense) It is quite unclear to what extent future economic policies will be governed by more interventionism and more trade protectionism.

Table 15 - Employment Effects of Foreign Trade by Major Trading Regions and Industry, Federal Republic of Germany, 1970-1976 (Employees)[d]

Industry	Change due to: Exports to MDCs[a] (1)	Imports from MDCs[a] (2)	Exports to LDCs[b] (3)	Imports from LDCs[b] (4)	Exports to CPEs[c] (5)	Imports from CPEs[c] (6)
Stones and earthen goods ind.	5236	- 1973	2307	46	683	- 395
Iron and steel ind.	11134	- 8288	4127	- 1018	19485	- 1423
Foundries	2044	- 1616	2253	- 68	182	- 159
Cold rolling mills	2617	- 2408	463	12	3565	- 521
Non-ferrous metal ind.	20817	- 4549	2643	6835	624	- 1974
Mineral oil ind.	- 582	- 787	- 26	- 355	0	- 639
Chemical ind.	82996	- 51913	14334	- 1379	249	- 2935
Sawmills and woodwork ind.	2851	519	290	- 1723	107	1067
Pulp, paper, paperboard ind.	7491	- 5026	317	- 193	441	- 978
Rubber and asbestos man. ind.	15811	- 13539	1399	- 680	1066	- 388
Structural and light metal eng.	4948	- 4790	12608	- 20	3286	- 79
Mechanical engineering	26052	- 22910	81866	- 993	46820	0
Man. of road vehicles	56168	- 44842	40081	- 1818	7546	- 664
Electrical engineering	118181	-114383	53594	- 15180	10263	- 2431
Precision and optical goods, watches	5380	- 30873	4921	- 3920	1974	- 458
Iron, sheet and metal goods ind.	6620	- 18687	1531	- 1829	- 5964	- 298
Fine ceramics ind.	1245	- 11928	262	- 819	590	- 197
Glass and glass prod. ind.	3870	- 5773	513	- 278	128	- 727
Woodwork man. ind.	15354	- 8386	2855	- 945	57	- 1977
Musical instr., toys, sport. goods ind.	7021	- 2481	158	- 3801	317	- 1267
Pulp and paper man. ind.	6908	- 5652	704	- 323	152	- 19
Printing and publishing	3593	- 1655	284	- 24	1537	95
Plastics prod. ind.	23590	- 18729	1810	- 925	1574	- 79
Leather ind.	52	- 1503	- 35	- 265	18	- 35
Leather man. ind.	407	- 2849	- 27	- 3201	27	- 651
Shoe ind.	2300	- 15023	217	- 1895	- 162	- 947
Textile ind.	59638	- 37130	6199	- 16660	8135	- 4325
Clothing ind.	31300	- 31841	1029	- 38909	271	- 9558
Food, beverages, tobacco	24882	- 24912	3397	489	- 229	- 588
Sum of Employment Effects	547924	-493927	240074	- 89839	102744	- 32550

[a]Developed market economies. - [b]Developing market economies. - [c]Centrally planned economies.

[d]According to definitions (2) and (3) - See Appendix 2.

Source: Statistisches Bundesamt, Fachserie D, Reihe 1, var. iss. - Fachserie G, Reihe 7, var. iss. - R. Krengel et al., Produktionsvolumen und -potential. Produktionsfaktoren der Industrie im Gebiet der Bundesrepublik Deutschland einschl. Saarland und Berlin (West). Statistische Kennziffern, Berlin, var. iss.

Internally, government interventions are gaining in importance, thus reducing the scope for the allocation of resources by market forces. Agriculture, energy, steel, shipbuilding are among the most prominant examples of sectors in which interventions have been introduced. Yet, there seems to be substantial scope for further trade intensification (Hufbauer/Chilas, 1974; Dick/Lörtscher, 1977).

As to future prospects in the Federal Republic of Germany and other developed countries, there are reasons to believe that overall economic growth will not attain the rates of the past. In the present study it is assumed, that between 1976 and 1990 the yearly growth rate of Gross Domestic Product in the Federal Republic of Germany will, on average, amount to 3.5 per cent, per annum, a rate which is lower than that for the previous fourteen years (4.1 per cent).[1/]

Future growth will most certainly be accompanied by significant changes in the structure of production and employment. While the share of the primary sector (agriculture, forestry and fishing) both in value added and employment will continue to shrink, the tertiary sector (wholesale and retail trade; transportation and communication; banking, insurance and real estate; ownership of dwellings; public administration and defense; health and educational services; other services) will expand its share. In contrast to developments throughout the 1950s and 1960s, the secondary sector (mining; manufacturing; construction; electricity, gas and water) will lose in importance, both in terms of value added and employment shares (Fels/Schatz/Wolter, 1970, 1971; Fels/Schatz, 1974.[2/] A rough estimate for sectoral employment structures suggest the following developments:[3/]

1/ Per capita income (3.9 per cent; 1962/1976: 4.1 per cent) will increase somewhat more than GDP as the population in the Federal Republic of Germany is expected to decrease during the period under consideration; on the other hand labour productivity, with a growing labour force, (3.2 per cent; 1962/1976: 4.4 per cent) will increase somewhat less than GDP.

2/ A selection of projections for sectoral employment structures and economic growth until 1990 can be found in Bundesanstalt für Arbeit, 1978. The economic growth rates reported in this publication roughly correspond to the growth assumption made in the present study.

3/ This projection is based on the assumption that (i) the number of foreigners in the labour force will be 1.9 millions in 1990, i.e. it will remain at the present level; (ii) the number of discouraged workers will account for about 0.3 million, i.e. roughly half of the estimated present level, but substantially higher than in the early 1970s; and (iii) that unemployment will be about 2 per cent of the labour force. (see Table A4,A5).

Sector	1950		1970		1977		1990	
	thsd.	p.c.	thsd.	p.c.	thsd.	p.c.	thsd.	p.c.
Primary	5169	24.1	2267	8.5	1695	6.8	928	3.5
Secondary	9009	42.0	13014	48.8	11364	45.6	11130	42.0
- Manufacturing	6799	31.7	10321	38.7	9097	36.5	8745	33.0
Tertiary	7271	33.9	11387	42.7	11863	47.6	14442	54.5
Total Employment	21449	100.0	26668	100.0	24922	100.0	26500	100.0

Table 16 provides a set of past development trends and projections for manufacturing production, apparent consumption, imports and exports for the Federal Republic of Germany between 1962 and 1990. While the share of manufacturing in value added will significantly decrease, it is estimated that the growth rate of manufacturing production will not fall as significantly.[1/] Apparent consumption of manufactured goods, which in the past grew at a lower rate than industrial production, is assumed to grow faster than production in the future. This means that the Federal Republic's balance of trade surplus, in relative terms will diminish. Already in the past, imports of manufactured goods into the Federal Republic of Germany grew at a higher rate than exports. It has been assumed that the differences in the growth rates will even increase. The rates of both import and export growth, however, presumably will be lower than in the last 15 years. Given the high degree of economic integration among industrialized countries, it is estimated that there is less scope for trade expansion than in the past. In the course of an expected intensifying division of labour with developing countries, however, the trade expansion of the Federal Republic of Germany with these countries could accelerate. As far as exports are concerned, this

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1/ It has to be kept in mind that the economy of the Federal Republic of Germany, and above all, its manufacturing, has been run through a deep recession in 1974/75. Therefore, figures are given not only for 1976 and 1990, the starting and the end years for the projections, but also for 1973, a year with a relatively normal rate of capacity utilization.

Table 16 - Production, Consumption and Trade of Manufactured Goods in the Federal Republic of Germany, 1962 to 1990 (at 1970 prices)

	Million DM				Average Annual Percentage Change			
	1962	1973	1976	1990	1962/73	1962/76	1973/90	1976/90
Production	326175	573789	579833	1101970	5.3	4.2	3.9	4.7
Apparent Consumption	302124	516462	523500	1003188	5.0	4.0	4.0	4.8
Exports								
- Total	57307	155208	174388	490247	9.5	8.3	7.0	7.7
- To Developing Countries	9467 (16.5)	18211 (11.7)	29214 (16.8)	71086 (14.5)	6.1	8.4	8.3	6.6
Imports								
- Total	33256	97811	118005	391465	10.3	9.5	8.5	8.9
- From Developing Countries	3394 (10.2)	7441 (7.6)	9859 (8.4)	46976 (12.0)	7.4	7.9	11.4	11.8

[a]Figures in brackets indicate developing countries' share in total exports and imports.

acceleration is visible only if the years after the oil price hike are excluded. These years have shown extremely high demand increases from OPEC - a demand growth which has been unique and presumably will not continue.

Tables 17-22 show projections of the structure of manufacturing production, apparent consumption, imports and exports.[1/] (The level of aggregation roughly corresponds to the three digit ISIC-level.) A separate estimate has been made for the Federal Republic's trade with developing countries. (See Appendix 3 for calculation procedures.)

From these projections it follows that exports of the Federal Republic of Germany to developing countries will concentrate further on a few industries: chemicals, mechanical engineering, electrical machinery and transport equipment will provide 85 per cent of all manufactured goods exports (1976: 78 per cent). In total exports of the Federal Republic of Germany to the world, this concentration is distinctly lower (1990: 65 per cent), and it hardly changes over time (1976: 63 per cent). What concerns imports of the Federal Republic of Germany from developing countries the picture is less clear-cut than what concerns exports. The four industries mentioned above will contribute 34 per cent to total manufacturing imports in 1990. However, as compared to 1976 this is a considerable gain in importance, mainly at the expense of such traditional imports as food or textiles. With these structural changes the pattern of imports from developing countries will become more similar to that of imports of the Federal Republic of Germany from all regions.

The trends discussed are the result of marked changes in the nature of the division of labour with developing countries. From a predominantly interindustrial division of labour, there is a shift to increasing intra-industry trade, similar to what prevails among industrialized countries. The basis for such an intra-industrial division of labour with developing countries is the fact that within industries factor absorption differs from sub-branch to sub-branch and, as well, among individual producers in the same sub-branch. This is particularly visible for chemicals, mechanical engineering, electrical machinery

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1/ Apparent consumption is defined as production plus imports minus exports.

Table 17 - Structure of Industrial Production, 1962-1990 (1970 prices) -

Industry	1962	1970	1973	1976	1985	1990
Food, Beverages & Tobacco	14,7	13,0	12,7	13,5	10,5	9,0
Textiles	5,9	4,7	4,1	3,9	3,5	2,8
Wearing apparel, except footwear	3,4	2,7	2,5	2,4	1,5	1,3
Footwear	1,0	0,6	0,5	0,4	0,2	0,1
Leather and products of leather	0,9	0,4	0,3	0,3	0,2	0,2
Wood and wood & cork products, Furniture & fixtures	3,3	3,2	3,6	3,5	3,2	3,5
Paper & paper products	2,6	2,5	2,5	2,4	2,2	2,2
Printing	1,9	1,8	1,8	1,7	1,5	1,5
Chemicals	7,7	9,8	11,0	11,8	15,9	16,6
Petroleum refineries, Misc., Products of petroleum and coal	2,9	3,7	3,5	3,2	3,6	3,3
Rubber products	1,2	1,4	1,4	1,1	1,2	1,2
Plastic products NEI	0,9	1,6	2,2	2,2	3,7	4,3
Pottery, china & earthernware	0,6	0,5	0,5	0,4	0,3	0,1
Glass and glass products	0,9	0,9	0,9	0,8	0,9	0,7
Other non-metallic mineral products	3,2	3,0	3,0	2,6	2,5	2,4
Iron & Steel	9,0	9,7	8,7	6,8	6,6	5,4
Non-ferrous metals	2,5	2,2	2,4	2,9	2,1	1,9
Fabricated metal products except machinery and equipment	8,4	6,1	6,1	7,0	4,6	4,2
Machinery except electrical	12,3	11,7	11,0	11,0	12,1	13,4
Electrical machinery	8,2	9,8	10,8	11,1	13,5	14,4
Transport equipment	7,0	9,1	9,0	9,4	8,8	10,2
Scientific measuring and controlling equipment	1,1	1,1	1,1	1,2	1,2	1,1
Musical instruments, toys, jewellery and sporting goods	0,5	0,4	0,4	0,4	0,3	0,2
Manufacturing[a]	100,0	100,0	100,0	100,0	100,0	100,0
(Millions of DM)	326175	517198	573789	579883	876300	

[a]Excluding manufacture of aircraft and shipbuilding.

Table 18 - Structure of Apparent Consumption, 1962-1990 (1970 prices)

Industry	1962	1970	1973	1976	1985	1990
Food, Beverages & Tobacco	18.8	15.4	15.0	16.1	12.5	11.0
Textiles	7.5	5.6	5.6	4.5	4.4	3.3
Wearing apparel, except footwear	4.1	3.2	3.2	3.2	2.8	2.7
Footwear	1.0	0.5	0.4	0.5	0.3	0.4
Leather and products of leather	.	0.8	0.7	0.7	0.5	0.5
Wood and wood & cork products, Furniture & fixtures	4.3	3.6	4.2	3.9	3.8	3.8
Paper & paper products	1.8	3.1	3.2	4.3	2.8	2.4
Printing	2.1	1.9	1.9	1.8	1.6	1.6
Chemicals	7.6	8.7	9.8	10.7	13.7	14.2
Petroleum refineries, Misc. Products of petroleum and coal	3.7	4.4	4.4	4.1	4.5	4.5
Rubber products	1.3	1.5	1.4	1.2	1.2	1.2
Plastic products NEI	1.0	1.6	2.1	1.5	3.8	4.3
Pottery, china & earthernware	.	0.4	0.5	0.4	0.3	0.4
Glass and glass products	0.9	0.9	1.0	0.9	1.0	1.0
Other non-metallic mineral products	3.9	3.3	3.5	3.0	2.8	2.7
Iron & Steel	7.3	9.8	8.2	6.6	6.3	5.7
Non-ferrous metals	4.0	3.1	3.4	3.8	2.8	3.2
Fabricated metal products, except machinery and equipment	5.7	5.7	5.9	6.8	4.9	4.5
Machinery, except electrical	9.9	8.9	8.1	7.7	8.3	8.6
Electrical machinery	8.1	9.3	10.4	10.6	14.0	14.8
Transport equipment	5.7	7.1	6.6	6.4	6.3	7.4
Scientific measuring and controlling equipment	0.8	0.9	0.9	1.1	1.1	1.4
Musical instruments, toys, jewellery and sporting goods	0.4	0.5	0.4	0.4	0.4	0.4
Total Manufacturing[a]	100.0	100.0	100.0	100.0	100.0	100.0
(Millions of DM)	302124		521366	523500	805800	

[a] Excluding manufacture of aircraft and shipbuilding.

Table 19 - Structure of Imports, 1962-1990 (1970 prices)

Industry	1962	1970	1973	1976	1985	1990
Food, Beverages & Tobacco	15.6	11.3	10.4	10.6	8.5	9.0
Textiles	10.5	8.1	7.9	7.9	6.6	6.5
Wearing apparel, except footwear	2.0	2.8	3.9	4.4	5.2	4.8
Footwear	0.7	1.0	1.1	1.3	0.9	1.1
Leather and products of leather	1.1	0.8	0.8	0.8	0.5	0.5
Wood and wood & cork products, Furniture & fixtures	4.9	2.7	2.8	2.4	2.7	2.0
Paper & paper products	4.5	4.1	4.0	3.5	3.1	2.4
Printing	0.4	0.5	0.5	0.4	0.4	0.3
Chemicals	7.0	10.1	11.3	11.0	11.8	12.2
Petroleum refineries, Misc. Products of petroleum and coal	3.5	3.2	3.3	3.0	2.3	2.1
Rubber products	1.0	1.3	1.4	1.5	1.1	1.5
Plastic products NEI	0.3	1.2	1.6	1.7	5.7	2.9
Pottery, china & earthernware	.	0.4	0.6	0.6	0.6	0.8
Glass and glass products	0.4	0.8	0.9	0.8	0.9	1.1
Other non-metallic mineral products	2.5	1.9	1.8	1.4	1.2	0.8
Iron and Steel	8.1	8.5	7.6	6.7	4.7	6.7
Non-ferrous metals	13.6	10.2	7.7	7.0	5.0	4.9
Fabricated metal products, except machinery and equipment	1.9	2.6	3.2	3.3	4.2	4.3
Machinery, except electrical	9.8	10.5	9.7	10.4	8.2	10.1
Electrical machinery	4.1	7.1	8.6	10.1	14.8	15.3
Transport equipment	3.3	8.4	8.0	8.2	8.6	7.4
Scientific measuring and controlling equipment	0.9	1.4	1.9	2.0	2.1	2.6
Musical instruments, toys, jewellery and sporting goods	1.0	1.2	1.1	1.0	0.9	0.7
Total Manufacturing[a]	100.0	100.0	100.0	100.0	100.0	100.0
(Millions of DM)	33256	80985,3	99647,5	118005,3	249200	

[a] Excluding manufacture of aircraft and shipbuilding.

Table 20 - Structure of Exports, 1962-1990 (1970 prices)

Industry	1962	1970	1973	1976	1985	1990
Food, Beverages & Tobacco	1.8	2.6	3.4	3.9	4.1	5.2
Textiles	3.2	3.7	3.8	4.6	3.8	4.8
Wearing apparel, except footwear	0.7	0.9	1.1	1.3	1.2	1.5
Footwear	.	0.2	0.2	0.2	0.1	0.1
Leather and products of leather	0.5	0.4	0.3	0.3	0.2	0.1
Wood and wood & cork products, Furniture & fixtures	0.9	1.2	1.3	1.5	1.3	1.7
Paper & paper products	0.8	1.1	1.3	1.3	1.5	1.9
Printing	0.8	0.8	0.7	0.7	0.6	0.4
Chemicals	10.8	14.7	15.3	14.7	16.2	17.5
Petroleum refineries, Misc. Products of petroleum and coal	0.9	0.8	0.6	0.3	0.3	0.2
Rubber products	0.8	1.0	1.2	1.2	1.1	1.5
Plastic products NEI	0.4	1.6	1.9	1.9	5.0	3.2
Pottery, china and earthernware	0.9	0.7	0.6	0.5	0.4	0.2
Glass and glass products	0.9	0.8	0.6	0.6	0.6	0.4
Other non-metallic mineral products	0.8	0.8	0.7	0.8	0.7	0.7
Iron & Steel	10.7	8.5	9.8	7.5	5.8	5.8
Non-ferrous metals	3.2	2.4	2.5	2.9	2.5	1.9
Fabricated metal except machinery and equipment	7.0	5.2	4.9	5.2	3.5	3.7
Machinery, except electrical	26.4	22.4	20.2	20.6	18.5	19.7
Electrical machinery	9.1	10.2	10.4	11.7	13.4	14.3
Transport equipment	15.2	16.9	16.5	15.5	14.9	13.1
Scientific measuring and controlling equipment	2.8	2.4	2.2	2.1	1.9	1.8
Musical instruments, toys, jewellery and sporting goods	1.4	0.8	0.7	0.7	0.4	0.3
Total manufacturing[a]	100.0	100.0	100.0	100.0	100.0	100.0
(Millions of DM)	57307,2	118395,6	152070,7	174388,3	319700	

[a]Excluding manufacture of aircraft and shipbuilding

Table 21 - Structure of Imports from Developing Countries, 1962-1990 (1970 prices)

Industry	1962	1970	1973	1976	1985	1990
Food, Beverages & Tobacco	31.5	31.5	27.4	18.2	13.5	9.7
Textiles	10.7	13.9	16.2	16.5	11.4	9.4
Wearing apparel, except footwear	2.5	6.0	11.8	19.3	18.8	18.0
Footwear	0.1	0.5	0.6	1.0	0.8	0.7
Leather and products of leather	1.3	2.0	2.8	2.5	1.2	0.8
Wood and wood & cork products, Furniture & fixtures	3.2	3.5	5.0	3.7	3.8	3.2
Paper and paper products	0.1	0.1	0.1	0.4	0.1	0
Printing	0	0.1	0.1	0	0	0
Chemicals	2.4	3.0	4.2	3.0	2.5	1.9
Petroleum refineries, Misc. Products of petroleum and coal	10.6	1.1	1.6	2.6	2.2	2.2
Rubber products	0.3	0.2	0.2	0.5	0.3	0.3
Plastic products NEI	0.1	0.3	0.7	0.6	2.8	4.5
Pottery, china & earthenware	0	0	0	0.3	0.4	0.4
Glass and glass products	0	0	0	0.1	0.3	0.5
Other non-metallic mineral products	1.1	0.7	0.6	0.4	0.2	0.1
Iron & Steel	0.1	1.0	2.0	1.6	1.5	1.3
Non-ferrous metals	34.7	30.9	16.9	12.3	7.6	4.6
Fabricated metal products, except machinery and equipment	0.2	0.3	0.7	1.2	4.1	5.6
Machinery, except electrical	0.1	0.5	0.6	3.2	2.2	2.6
Electrical machinery	0.1	1.5	4.0	8.0	18.5	25.9
Transport equipment	0	0.4	0.9	1.5	3.3	3.3
Scientific measuring and controlling equipment	0	0.2	0.9	1.5	2.5	2.9
Musical instruments, toys, jewellery and sporting goods	0.9	2.2	2.5	2.8	2.2	2.0
Total manufacturing[a]	100.0	100.0	100.0	100.0	100.0	100.0
(Millions of DM)	3642	5981	7675	9957	27463	

[a] Excluding manufacture of aircraft and shipbuilding.

Table 22 - Structure of Exports to Developing Countries, 1962-1990 (1970 prices)

Industry	1962	1970	1973	1976	1985	1990
Food, Beverages & Tobacco	1.7	2.0	2.3	2.5	2.2	1.8
Textiles	2.0	2.1	2.1	2.0	1.5	1.3
Wearing apparel, except footwear	0.2	0.2	0.2	0.2	0.2	0.2
Footwear	.	0.1	0.1	0.1	0	0
Leather and products of leather	0.4	0.2	0.2	0.1	0.1	0
Wood and wood & cork products, Furniture & fixtures	0.4	0.3	0.3	0.8	0.2	0.2
Paper and paper products	0.5	0.6	0.7	0.5	0.7	0.7
Printing	0.4	0.3	0.2	0.2	0.2	0.1
Chemicals	14.7	21.2	22.0	14.6	22.7	23.9
Petroleum refineries, Misc. Products of petroleum and coal	0.2	0.2	0.2	0.1	0.1	0.1
Rubber products	1.0	0.9	0.7	0.7	0.5	0.4
Plastic products NEI	0.2	0.6	0.7	0.6	1.6	2.2
Pottery, china & earthenware	0.5	0.4	0.3	0.2	0.2	0.1
Glass and glass products	0.6	0.5	0.4	0.3	0.3	0.3
Other non-metallic mineral products	0.6	0.5	0.5	0.8	0.4	0.3
Iron & Steel	7.2	5.7	7.[illegible]	4.3	3.6	2.8
Non-ferrous metals	1.6	1.4	1.5	1.5	1.5	1.4
Fabricated metal products, except machinery and equipment	9.3	5.2	3.8	5.7	1.6	1.1
Machinery, except electrical	28.2	26.0	24.0	27.8	27.6	27.0
Electrical machinery	10.2	10.9	11.1	13.8	14.4	15.8
Transport equipment	16.7	17.7	18.7	21.2	18.6	18.4
Scientific measuring and controlling equipment	2.6	2.4	2.2	1.8	1.7	1.6
Musical instruments, toys, jewellery and sporting goods	0.8	0.5	0.3	0.2	0.2	0.2
Total Manufacturing[a]	100.0	100.0	100.0	100.0	100.0	100.0
(Millions of DM)	9467	14330	18062	29214	38715	

[a] Excluding manufacture of aircraft and shipbuilding.

Table 23- Share of Imports from Developing Countries in Total Imports and in Apparent Consumption, 1962-1990 (1970 prices)

Industry	Imports from LDCs as Percent of Total Imports			Imports from LDCs as Percent of Apparent Consumption		
	1962	1976	1990	1962	1976	1990
Food, Beverages & Tobacco	22.1	14.5	12.9	2.2	1.4	4.1
Textiles	11.2	17.5	17.4	2.0	6.7	13.3
Wearing apparel, except footwear	14.1	34.3	45.0	0.8	11.3	31.2
Footwear	0.9	6.9	7.6	0.1	2.7	6.6
Leather and products of leather	12.6	26.1	19.2	1.3	10.3	9.1
Wood and wood & cork products, Furniture & fixtures	7.2	13.2	19.2	1.0	1.8	3.9
Paper and paper products	0.2	0.9	0.5	0	0.2	0.2
Printing	0.5	1.0	4.0	0	0	0.3
Chemicals	3.7	2.3	1.9	0.4	0.5	0.6
Petroleum refineries, Misc., Products of petroleum and coal	33.5	7.3	12.6	4.1	1.9	2.2
Rubber products	3.0	2.7	2.4	0.2	0.6	1.1
Plastic products NEI	2.8	3.2	18.6	0.1	0.5	4.9
Pottery, china & earthernware	0.4	3.5	6.0	0	1.0	4.7
Glass and glass products	0.1	1.6	5.5	0	0.3	2.3
Other non-metallic mineral products	5.0	2.5	1.5	0.4	0.3	0.2
Iron & Steel	0.1	2.0	2.3	0	0.5	1.1
Non-ferrous metals	27.8	14.9	11.3	12.6	6.6	6.7
Fabricated metal products, except machinery and equipment	0	3.1	15.6	0	0.3	5.8
Machinery, except electrical	0.1	2.6	3.1	0	0.6	1.4
Electrical machinery	0.3	6.7	20.3	0	1.2	8.2
Transport equipment	0	1.8	5.4	0	0.4	2.1
Scientific measuring and controlling equipment	0.5	6.2	13.4	0.1	2.4	9.7
Musical instruments, toys, jewellery and sporting goods	0.7	22.3	34.3	2.6	12.3	23.4
Manufacturing[a]	100.0	100.0	100.0	100.0	100.0	100.0

[a] Excluding manufacture of aircraft and shipbuilding.

and transport equipment - the four industries which dominate trade among industrialized countries. These very branches are the growth industries proper of the Federal Republic's manufacturing (table 17). And, on the whole, their research and development and/or skill intensity distinctly exceeds the manufacturing average (table 13). More detailed studies, however, which, for instance, have been carried out for the engineering sector of the Federal Republic of Germany, indicate that various lines of production seem to have, or will experience, comparative cost disadvantages at their location in the Federal Republic of Germany, vis-à-vis locations in developing countries. Such lines of production, characterized by relative low skill intensity or a high degree of standardization in products or production processes, are[1]

- office machines, simple tools, armatures and sewing machines in mechanical engineering;
- switchgear, wiring devices, electro-mechanical hand tools, power appliances, lighting fixtures, light bulbs, radio and TV receiving equipment, and components in electrical engineering;
- hand tools, heating and cooking equipment, metal cans and apparatus, bicycle and motor vehicle parts and accessories, and cutlery in fabricated metal products;
- vehicle parts, motor bikes, bicycles and trailers in road transport equipment.

Similarly, various sub-branches in chemicals could be well suited for redeployment to the developing countries.

The fact that traditional fields of production will lose in importance in the import basket of the Federal Republic of Germany from developing countries does not imply that suppliers from low wage countries will not continue to be vigorous competitors for domestic producers. Rather, as table 23 shows, in these fields, as well as in most other branches, producers located in developing countries will enjoy increasing market shares.

1/ Dicke/Weiss, 1978.

V. Conclusions

As many other industrialized countries, the Federal Republic of Germany is presently facing considerable structural adjustment pressures. Manufactures from developing countries is only one cause, and, at any rate, it is not the most important one. Technological progress, which makes traditional jobs and older production capacities obsolete, and changes in demand, from which some productions benefit while others do not, play a much stronger role. A rough estimate, for instance, indicates that between 1970 and 1976, displacement by productivity increases surpassed displacements by imports from developing countries at a ratio exceeding 20 to 1. On import markets of the Federal Republic of Germany, suppliers from industrialized countries, as in the past, will remain by far the most important competitors for domestic producers. The same holds on world markets for manufactures, where exporters of the Federal Republic of Germany will be confronted mainly with competition from other developed countries.

Nevertheless, the future division of labour with the developing countries will evoke changes in the production structure of the Federal Republic of Germany. Increasing imports from developing countries can be expected to lead to increasing exports to developing countries more or less simultaneously. But additional jobs due to increasing exports will emerge mainly in capital goods industries while displacement due to increasing imports from developing countries will be concentrated in the consumer goods sector. Branches and lines of production which are exposed to increasing competition from low wage countries are often not capable of product innovation and/or investment in new production processes.

In the advanced countries, especially low skilled labour has to bare the brunt of the adjustment burden. This is shown in empirical studies for the Federal Republic of Germany and for other developed market economy countries (Wolter, 1977). Adjustment difficulties arise since the growth industries of the Federal Republic of Germany in the first instance, absorb qualified labour.

The regional dimension of adjustment to trade with developing countries creates additional problems. There is evidence that mainly the growth poles of industrialized countries benefit from the export demand of developing countries, while adjustment pressure due to increasing imports from the developing countries is concentrated on regions which already are structurally weak and show relatively high unemployment rates. Among the persons displaced, there is a high share of female workers, who are, interregionally, relatively immobile due to family ties.

A particular feature of the future division of labour with developing countries will be an increase in intra-industry trade, partly in the form of production sharing - international relocation of segments of of the production process. In many cases, developing countries supply cheap industrial inputs and, thereby, strengthen the competitiveness of those production segments which remain in the advanced countries. The manufacturing sector itself in the Federal Republic of Germany even imports cheap finished manufactures from developing countries, often in order to allow for lower average prices of its supply basket or to complete the product line. According to calculations of the Federal Republic Textile Producers' Association, for example, a large part of textile and clothing imports is commissioned by the domestic industry: in 1975, 90 per cent of yarn, 60 per cent of fabrics and almost 25 per cent of finished product imports. The trend towards intra-industry trade will accelerate with increasing industrialization in the Third World. Adjustment for intra-industry trade frequently takes the form of intra-firm specialization.

Appendix 1: Calculation Procedures for Revealed Comparative Advantage

For present purposes, Balassa's original concept was transformed to ensure unboundedness from below, symmetry and continuity.[1/] The following endogenous variable was adopted:

$$RCA_{it} = \ln \left(x_{it} \Big/ \sum_{i=1}^{n} x_{it}\right) \Big/ \left(m_{it} \Big/ \sum_{i=1}^{n} m_{it}\right)$$

where

x = German exports to LDCs

m = German imports from LDCs

i = industry index (i=1, ..., 33)

t = time index.

The sum of industries constitutes Germany's manufacturing sector.

Corresponding to the abbreviations for the various variables given above, the four models may be written as follows:

(1) $RCA_{it} = f_1 (HCI_i, PCI_i, ERA_i)$

(2) $RCA_{it} = f_2 (RCI_i, CMI_i, PCI_i, ERA_i)$

(3) $RCA_{it} = f_3 (RCI_i, CMI_i, PCI_i, RMI_i, ENI_i, EVI_i, ERA_i)$

(4) $RCA_{it} = f_4 (RDI_i, STA_i, SCE_i, ERA_i)$

where in addition STA represents a variable to indicate the degree of standardization of production processes. In the present analysis, physical capital intensity was taken as a proxy for this variable.

1/ The present formula differs from that adopted previously in order to avoid possible clustering which would disturb regression results. Of course, the ranking of industries remains the same with the two concepts.

Table A 1.1 - Determinants of the Federal Republic of Germany's Industrial Competitiveness in Trade with Developing Countries[a], Selected Hypotheses, Cross Industry Regressions[b], 1970, 1975 and 1976

No.		R^2_{adj}	F	n
	- Human Capital Hypothesis -			
(1)	RCA 70 = -7.938 + 4.786 ln HCI - 1.746 ln PCI - 1.189 ln ERA (+25.368)*** (-7.277)*** (-4.822)***	0.53	12.14	31
(2)	RCA 75 = -7.094 + 3.747 ln HCI - 0.936 ln PCI - 1.473 ln ERA (+16.171)*** (-2.176)** (-7.701)***	0.47	10.04	31
(3)	RCA 76 = -6.897 + 4.092 ln PCI - 1.413 ln PCI - 1.407 ln ERA (+23.907)*** (-6.149)*** (-8.709)***	0.55	13.47	31
	- Human Skill Hypothesis -			
(4)	RCA 70 = 9.174 - 0.116 ULI - 0.034 CMI - 0.019 PCI - 0.071 ERA (-2.840)*** (-0.135) (-3.020)*** (-2.791)***	0.18	2.63	30
(5)	RCA 75 = 5.330 - 0.087 ULI + 0.019 CMI - 0.017 PCI - 0.073 ERA (-2.228)** (+0.061) (-3.377)*** (-4.051)***	0.30	4.17	30
(6)	RCA 76 = 6.978 - 0.111 ULI + 0.006 CMI - 0.022 PCI - 0.069 ERA (-4.572)*** (+0.008) (-7.189)*** (-4.537)***	0.43	6.53	30
	- "Availability" Hypothesis -			
(7)	RCA 70 = 42.629 - 4.579 ln ULI - 4.414 ln CMI - 2.195 ln PCI - 1.005 ln RMI - 0.950 ln EVI (-3.596)*** (-4.312)*** (-1.339)* (-13.861)*** (-1.021) + 2.401 ln ENI - 2.301 ln ERA (+7.634)*** (-4.210)***	0.73	7.51	18
(8)	RCA 75 = 31.648 - 3.214 ln ULI - 1.507 ln CMI - 3.596 ln PCI - 0.647 ln RMI - 0.594 ln EVI (-1.658)* (-0.457) (-3.361)*** (-5.380)*** (-0.374) + 2.761 ln ENI - 2.597 ln ERA (+9.445)*** (-5.01?)***	0.70	6.67	18
(9)	RCA 76 = 31.097 - 3.261 ln ULI - 1.155 ln CMI - 3.731 ln PCI - 0.606 ln RMI - 0.417 ln EVI (-1.657)* (-0.269) (-3.514)*** (-4.575)*** (-0.179) + 2.537 ln ENI - 2.455 ln ERA (+7.749)*** (-4.357)***	0.69	6.33	18
	- Technology Account -			
(10)	RCA 70 = 1.675 + 0.199 RDI - 0.010 STA + 0.036 SCE - 0.209 ERA (+10.364)*** (-2.439)*** (+7.681)*** (-18.503)***	0.62	7.98	18
(11)	RCA 75 = 0.653 + 0.106 RDI - 0.013 STA + 0.036 SCE - 0.158 ERA (+2.628)*** (-3.805)*** (+6.916)*** (-9.446)***	0.49	5.14	18
(12)	RCA 76 = 0.852 + 0.146 RDI - 0.013 STA + 0.031 SCE - 0.162 ERA (+5.823)*** (-4.684)*** (+5.765)*** (-11.718)***	0.54	6.03	18

t-statistics in parantheses; * = significant at 10 p.c.; ** = significant at 5 p.c.; *** = significant at 1 p.c. (one-tail test).

[a]Market economies only. - [b]Abreviations for variables: RCA 70 = Revealed comparative advantage in 1970; RCA 75 = Revealed comparative advantage in 1975; RCA 76 = Revealed comparative advantage in 1976; HCI = Human capital intensity; PCI = Physical capital intensity; ERA = Effective rate of assistance; ULI = Unskilled labour intensity; CMI = Craftsmen intensity; RMI = Raw material intensity; EVI = Environment intensity; ENI = Energy intensity; RDI = R&D intensity; STA = Standardization; SCE = Scale economies. For details and measurement concepts, see text.

Source: Calculated from Statistisches Bundesamt (Fachserie G/Reihe 7; Fachserie H/Reihe 6; Fachserie M/Reihe 15; Fachserie D/Reihe 4); Krengel et al. (1977); JÜttemeier et al. (1978); Ochel (1977); Mai (1974); Echterhoff-Severitt (1977).

Table A 1.2 - Determinants of the Federal Republic of Germany's Industrial Competitiveness in Trade with Developing Asia[a], Selected Hypotheses, Cross Industry Regressions[b], 1970 and 1975

No.		R^2_{adj}	F	n
	- Human Capital Hypothesis -			
(1)	RCA 70 = - 1.881 + 0.120 HCI - 0.037 PCI - 0.094 ERA (+21.783)*** (-11.354)*** (-5.983)***	0.42	8.32	31
(2)	RCA 75 = - 2.252 + 0.107 HCI - 0.032 PCI - 0.086 ERA (+19.672)*** (-9.814)*** (-5.695)***	0.40	7.55	31
	- Human Skill Hypothesis -			
(1)	RCA 70 = 3.041 - 0.061 ULI + 0.075 CMI - 0.014 PCI - 0.065 ERA (-0.649) (+0.533) (-1.310)* (-1.882)**	0.21	2.88	30
(2)	RCA 75 = 1.214 - 0.053 ULI + 0.096 CMI - 0.013 PCI - 0.059 ERA (-0.663) (+1.221) (-1.554)* (-2.194)**	0.31	4.32	30
	- "Availability" Hypothesis -			
(1)	RCA 70 = 44.719 - 4.899 ln ULI - 2.883 ln CMI - 4.279 ln PCI - 0.894 ln RMI - 1.268 ln EVI (-4.202)*** (-1.879)** (-5.193)*** (-11.195)*** (-1.856)** + 3.638 ln ENI - 2.593 ln ERA (+17.892)*** (-5.459)***	0.78	9.84	18
(2)	RCA 75 = 29.921 - 3.009 ln ULI - 0.191 ln CMI - 4.717 ln PCI - 0.518 ln RMI - 0.783 ln EVI (-1.471)* (-0.008) (-5.854)*** (-3.492)*** (-0.657) + 3.496 ln ENI - 2.845 ln ERA (+15.335)*** (-6.097)***			
	- Technology Account -			
(1)	RCA 70 = 1.061 + 0.142 RDI - 0.014 STA + 0.046 SCE - 0.193 ERA (+4.914)*** (-4.342)*** (+11.775)*** (-14.742)***	0.62	7.94	18
(2)	RCA 75 = 0.144 + 0.084 RDI - 0.014 STA + 0.046 SCE - 0.146 ERA (+1.306)* (-3.344)*** (+8.636)*** (-6.351)***	0.45	4.53	18

t-statistics in parantheses; * = significant at 10 p.c.; ** = significant at 5 p.c.; *** = significant at 1 p.c. (one-tailed test).

[a]Market economies only. - [b]Abreviations for variables: RCA 70 = Revealed Comparative Advantage in 1970; RCA 75 = Revealed Comparative Advantage in 1975; HCI = Human capital intensity; PCI = Physical capital intensity; ERA = Effective rate of assistance; ULI = Unskilled labour intensity; CMI = Craftsmen intensity; RMI = Raw material intensity; EVI = Environment intensity; ENI = Energy intensity; RDI = R&D intensity; STA = Standardization; SCE = Scale economies. For details and measurement concepts, see text.

Source: Calculated from Statistisches Bundesamt (Fachserie G/Reihe 7; Fachserie H/Reihe 6; Fachserie N/Reihe 15; Fachserie D/Reihe 4); Krengel et al. (1977); Jüttemeier, et al. (1978); Ochel (1977); Mai (1974); Echterhoff-Severitt (1977).

Table A 1.3 - Determinants of the Federal Republic of Germany's Industrial Competitiveness in Trade with Latin America[a], Selected Hypotheses, Cross Industry Regressions[b], 1970 and 1975

No.		R^2_{adj}	F	n
	- Human Capital Hypothesis -			
(1)	RCA 70 = - 8.382 + 5.872 ln HCI - 3.312 ln PCI - 0.013 ln ERA (+23.092)*** (-15.838)*** (-0.000)	0.44	8.88	31
(2)	RCA 75 = -11.153 + 5.922 ln HCI - 2.806 ln PCI - 0.219 ln ERA (+24.854)*** (-12.029)*** (-0.104)	0.45	9.16	31
	- Human Skill Hypothesis -			
(1)	RCA 70 = 16.132 - 0.177 ULI - 0.147 OMI - 0.034 PCI - 0.020 ERA (-4.349)*** (-1.669)* (-6.310)*** (-0.147)	0.12	1.98	30
(2)	RCA 75 = 17.828 - 0.218 ULI - 0.174 OMI - 0.036 PCI - 0.033 ERA (-8.048)*** (-2.847)*** (-8.717)*** (-0.468)	0.24	3.26	30
	- "Availability" Hypothesis -			
(1)	RCA 70 = 53.939 - 4.749 ln ULI - 7.347 ln OMI - 2.096 ln PCI - 1.234 ln RMI - 1.140 ln EVI (-2.346)** (-7.252)*** (-0.740) (-12.684)*** (-0.892) + 2.437 ln ENI - 2.537 ln ERA (+4.771)*** (-3.106)***	0.62	4.97	18
(2)	RCA 75 = 55.637 - 5.298 ln ULI - 5.851 ln OMI - 4.119 ln PCI - 1.207 ln RMI + 0.616 ln EVI (-4.086)*** (-6.434)*** (-4.001)*** (-16.978)*** (+0.364) + 2.167 ln ENI - 2.248 ln ERA (+5.280)*** (-3.413)***	0.73	7.72	18
	- Technology Account -			
(1)	RCA 70 = 3.071 + 0.303 RDI - 0.016 STA + 0.025 SCE - 0.206 ERA (+10.296)*** (-2.763)*** (+1.567)** (-7.704)***	0.51	5.35	18
(2)	RCA 75 = 2.199 + 0.284 RDI - 0.017 STA + 0.026 SCE - 0.205 ERA (+9.663)*** (-3.364)*** (+1.779)** (-8.129)***	0.51	5.36	18

t-statistics in parantheses; * = significant at 10 p.c.; ** = significant at 5 p.c.; *** = significant at 1 p.c. (one-tailed test).

[a] Market economies only. - [b] Abreviations for variables: RCA 70 = Revealed comparative advantage in 1970; RCA 75 = Revealed comparative advantage in 1975; HCI = Human capital intensity; PCI = Physical capital intensity; ERA = Effective rate of assistance; ULI = Unskilled labour intensity; OMI = Craftsmen intensity; RMI = Raw material intensity; EVI = Environment intensity; ENI = Energy intensity; RDI = R&D intensity; STA = Standardization; SCE = Scale economies. For details and measurement concepts, see text.

Source: Calculated from Statistisches Bundesamt (Fachserie G/Reihe 7; Fachserie H/Reihe 6; Fachserie M/Reihe 15; Fachserie D/Reihe 4); Krengel et al. (1977); Jüttemeier, et al. (1978); Ochel (1977); Mai (1974); Echterhoff-Severitt (1977).

Table A 1.4 - Determinants of the Federal Republic of Germany's Industrial Competitiveness in Trade with Developing Africa[a], Selected Hypotheses, Cross Industry Regressions[b], 1970 and 1975

No.		R^2_{adj}	F	n
	- Human Capital Hypothesis -			
(1)	RCA 70 = 0.108 + 0.107 HCI - 0.034 PCI - 0.111 ERA (+15.574)*** (-8.677)*** (-7.462)***	0.37	6.79	31
(2)	RCA 75 = 4.384 + 0.007 HCI - 0.039 PCI + 0.059 ERA (+0.001) (-0.205) (+0.038)	-0.10	0.11	31
	- Human Skill Hypothesis -			
(1)	RCA 70 = 31.845 - 3.158 ln ULI - 3.339 ln CMI - 0.383 ln PCI - 2.237 ln ERA (-2.211)** (-1.733)* (-0.199) (-6.014)***	0.11	1.90	30
(2)	RCA 75 = 49.378 - 2.020 ln ULI -10.430 ln CMI - 1.071 ln PCI + 0.085 ln ERA (-0.022) (-0.420) (-0.039) (+0.000)	-0.12	0.23	30
	- "Availability" Hypothesis -			
(1)	RCA 70 = 17.947 - 0.197 ULI - 0.205 CMI + 0.070 PCI - 0.224 RMI - 0,584 EVI + 0.013 ENI - 0.075 ERA (-5.556)*** (-5.003)*** (+7.191)*** (-7.405)*** (-5.443)*** (+0.088) (-0.356)	0.61	4.76	18
(2)	RCA 75 = 46.582 - 3.854 ln ULI - 4.942 ln CMI - 2.728 ln PCI - 0.878 ln RMI - 1.895 ln EVI (-1.967)** (-4.177)*** (-1.597)* (-8.177)*** (-3.139)*** + 3.105 ln ENI - 3.848 ln ERA (+9.859)*** (-9.095)***	0.74	7.88	18
	- Technology Account -			
(1)	RCA 70 = 3.422 + 0.215 RDI - 0.005 STA + 0.032 SCE - 0.247 ERA (+4.494)*** (-0.261) (+2.280)** (-9.642)***	0.34	3.25	18
(2)	RCA 75 = 2.541 + 0.124 RDI - 0.022 STA + 0.053 SCE - 0.242 ERA (+2.284)** (-7.008)*** (+9.519)*** (-14.103)***	0.62	7.92	18

t-statistics in parantheses; * = significant at 10 p.c.; ** = significant at 5 p.c.; *** = significant at 1 p.c. (one-tailed test).

[a]Market economies only. - [b]Abreviations for variables: RCA 70 = Revealed comparative advantage in 1970; RCA 75 = Revealed comparative advantage in 1975; HCI = Human capital intensity; PCI = Physical capital intensity; ERA = Effective rate of assistance; ULI = Unskilled labour intensity; CMI = Craftsmen intensity; RMI = Raw material intensity; EVI = Environment intensity; ENI = Energy intensity; RDI = R&D intensity; STA = Standardization; SCE = Scale economies. For details and measurement concepts, see text.

Source: Calculated from Statistisches Bundesamt (Fachserie F/Reihe 7; Fachserie H/Reihe 6; Fachserie M/Reihe 15; Fachserie D/Reihe 4); Krengel et al. (1977); Jüttemeier et al. (1978); Ochel (1977); Mai (1974); Echterhoff-Severitt (1977).

Appendix 2: Calculation Procedure for Sources of Employment Changes by Industry

The analysis is based on four definitions:[1/]

(1) $O = C + X - M$

(2) $X = X_{MDC} + X_{LDC} + X_{CPE}$

(3) $M = M_{MDC} + M_{LDC} + M_{CPE}$

(4) $P = O / E$

where O, C, X, M are output, domestic apparent consumption, exports and imports in real terms, respectively; P is labour productivity; MDC, LDC and CPE refer to more developed countries, less developed countries and centrally planned economies.

From (1) and (4) follows

(5) $E = (C + X - M) / P.$

By Differentiation

(6) $\frac{dE}{dt} = \frac{1}{P} \cdot \frac{dC}{dt} + \frac{1}{P} \cdot \frac{dX}{dt} - \frac{1}{P} \cdot \frac{dM}{dt} - \frac{O}{p^2} \cdot \frac{dP}{dt}$

or for minor changes approximately

(7) $E_t - E_{t-1} = \frac{1}{P_{t-1}} (C_t - C_{t-1}) + \frac{1}{P_{t-1}} (X_t - X_{t-1})$

$$\underset{\text{I}}{} \qquad \underset{\text{II}}{}$$

$$- \frac{1}{P_{t-1}} (M_t - M_{t-1}) - E_t \left(\frac{P_t}{P_{t-1}} - 1\right)$$

$$\underset{\text{III}}{} \qquad \underset{\text{IV}}{}$$

I to IV represent the employment changes between t-1 and t which are attributable to changes in consumption, exports, imports and productivity.

1/ Similar calculations have been carried out for the United States and the United Kingdom. See Frank (1975) and Cable (1978).

By using definitions (3) and (4) terms II and III can be further split to calculate employment effects of trade with the major trading partners. It has been stated elsewhere that the approach is subject to a number of restrictive assumptions as it assumes no interaction between the various sources of employment changes, no indirect employment effects, and no change in inventories among others (Cable, 1978). Especially crucial is the assumption that productivity is the same in export industries as in industries which suffer from import competition. For the reason mentioned, the model allows only for rough estimates.

Appendix 3: Calculation Procedures for Structure of Industrial Production, of Apparent Consumption, of Imports, of Exports, of Imports from Developing Countries, of Exports to Developing Countries, and of Share of Imports from Developing Countries in Total Imports and in Apparent Consumption[1/]

The projections are based on time series estimates for apparent consumption, exports and imports by industry according to the following functional relationship:

(1) $AC_i = f\ (RPP_i, GDP)$

(2) $TI_i = f\ (RIP_i, GDP)$

(3) $TE_i = f\ (WP)$

where

i - industry index

AC - apparent consumption in thousand DM at 1970 prices

TI - total imports in thousand DM at 1970 prices

TE - total exports in thousand DM at 1970 prices

GDP - the Federal Republic of Germany's Gross Domestic Product in million DM at 1970 prices

WP - index for World Gross Domestic Product at 1970 prices (1970 = 100)

RPP - index of producer prices of a given industry divided by index of producer prices for manufacturing produots (both indices: 1970 = 100)

RIP - index of imports prices for products of a given industry divided by index of producer prices for the same industry (both indices: 1970 = 100)

An L indicates that a variable has entered regression estimates logarithmically transformed. The approach was meant both to take account of changes in relative prices and differences in income elasticities of demand. In the case of exports, however, for statistical reasons demand for exports from the Federal Republic of Germany could be estimated as a

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1/ Apparent oonsumption is defined as production plus imports minus exports.

function of world income only. The period of observation covers the years 1962 to 1976.[1] The estimates have originally been carried out for industries according to the national classification scheme.

Tables A 4.6 to A 4.8 contain the regression estimates for the various aggregates and industries. Four remarks have to be made:

(i) Out of four types (linear and various logarithmic) of functional relationships which were tested, the double log approach generally yielded the best fit;

(ii) in most cases the estimates are statistically significant as measured by $\bar{R}^2$s (adjusted);

(iii) for most coefficients t-statistics, which are given in brackets, reveal significancy as well;

(iv) price elasticities, however, even if significant, do sometimes not come up with the expected negative sign. This may be due to problems of intercorrelation which generally are involved in time series estimates.

The regression equations were used to arrive at a first set of projections for 1990. The assumed values of the exogenous variables underlying this exercise are given in table A 4.9. Relative price trends were extrapolated from time series regression estimates selecting best fits from linear and various logarithmic approaches. World Bank estimates for growth of world income until 1985 were assumed to hold through 1990 (World Bank, 1978). The oalculations obtained were tested for consistency and plausibility, and accordingly adjusted. Out of the 23 industries, in 7 cases adjustments exceeded two percentage points: food (exports, imports); clothing (imports); plastic products (exports, imports); machinery (apparent consumption, exports, imports); electrical machinery (exports, imports); transport equipment (imports); scientific measuring and controlling equipment (imports). In adjusting, recourse was taken to previous projections until 1985, which were arrived at by using a different approach (Horn/Schatz/Schmidt/Wolter, 1976). Both the 1990 projections and the earlier projections

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1/ Regionalized import and export figures by industry are not available before 1962.

for 1985 are given in tables 18 to 20. Table 17 contains implicit values for industrial production calculated from the projections for apparent consumption, exports and imports in an iterative procedure, which partly led to the above reported adjustments.

A similar approach was chosen in an effort to project the Federal Republic's trade with developing countries;[1/] again it was aimed at separating price and income components of import and export demand. In deflating import and export values by industry, the general import and export price indices had to be used as the Federal Republic statistical authorities do not publish price indices for trade with developing countries: this is probably a major shortcoming, if only because the intra-industrial product mix in trade with developing countries differs from that in trade with industrialized countries. Regression results are presented in table A 4.10 and A 4.11.

Projections by the use of these equations, however, led in most cases to results too implausible to provide a reasonable basis. Apart from possible deficiencies resulting from the price index problem mentioned above, in a number of cases strong base effects seem to be present. Starting from low levels of imports or exports, in the past high growth rates have been attained. However, for economic reasons one can scarcely expect that similar rates are obtainable in the longer term, too. Various other efforts to gain a systematic approach by applying other concepts of historical income elasticities also failed to yield convincing results.[2/]

1/ For the export estimates, income of developing countries (DP) was substituted for world income as exogenous variable.

2/ These efforts comprised simple regressions as well as various calculations of average elasticities for different time periods, which lead to widely differing elasticities. - For some concepts income elasticities for individual branches even exceeding 100 could be observed. (For example, elasticities of import demand for the period 1962/76 in the case of electrical machinery: 252; mechanical engineering: 153; transport equipment: 1283.)

For these reasons, a different approach was chosen. In this approach trade with developing countries was linked to total trade in that industry specific imports from developing countries were estimated as a function of industry specific total imports; the same procedure was applied for exports. In other words, basically the approach consists of trend functions of market shares. These shifts in market shares do reflect the effects both of demand and relative price changes over time. These estimates provided a starting point for the final projections which again (tables 21 and 22) take into acoount previous estimates for 1985 (Schatz/Wolter, 1977).

APPENDIX 4

ADDITIONAL TABLES

Table 4.1 - Development and Structure of the Federal Republic of Germany's Foreign Trade with Goods of Manufacturing Industries, by Country Groups and Industries, 1962-1976

Imports from / Exports to	Imports: Average annual rate of change p.c.			Imports: Percentage shares		Imports: Value Mio. DM	Exports: Average annual rate of change p.c.			Exports: Percentage shares		Exports: Value Mio. DM
	1962/70	1970/73	1973/76	1970	1976	1976	1962/70	1970/73	1973/76	1970	1976	1976
All Industries												
World	13,2	10,5	13,2	100,0	100,0	158 481	11,6	12,8	12,8	100,0	100,0	243 795
- Developed Countries	13,7	10,0	12,7	88,7	86,5	137 064	12,3	12,2	10,1	83,5	76,3	185 995
- EC[a]	16,5	12,1	11,3	51,8	51,5	81 609	14,5	12,7	11,3	39,1	37,4	91 245
- Northamerica	11,7	- 1,7	11,9	12,0	8,1	12 856	14,2	9,6	- 1,0	10,4	6,5	15 800
- Developing Countries	8,7	12,0	16,3	7,4	8,4	13 240	7,5	11,2	27,0	12,3	16,8	40 841
- Socialist Countries	12,0	17,0	16,8	4,0	5,2	8 178	11,6	27,1	17,7	4,3	7,0	16 959
Raw Material and Production Industries												
World	12,5	7,8	14,0	100,0	100,0	60 422	11,2	11,6	12,5	100,0	100,0	66 399
- Developed Countries	13,5	7,9	13,4	87,4	86,8	52 444	11,8	11,0	11,1	80,9	76,6	50 856
- EC[a]	16,6	13,1	12,8	46,0	51,8	31 288	12,9	12,4	11,7	40,4	40,4	26 813
- Northamerica	12,7	- 9,1	15,0	13,8	8,6	5 169	13,9	8,5	2,0	6,8	4,7	3 111
- Developing Countries	6,3	- 2,0	13,4	7,3	5,4	3 272	8,1	10,7	13,9	12,7	12,9	8 552
- Socialist Countries	8,7	14,6	21,5	5,3	7,8	4 706	10,2	21,0	22,7	6,4	10,5	6 991
Capital Goods Industries												
World	17,0	9,2	15,0	100,0	100,0	48 775	11,4	12,4	12,7	100,0	100,0	139 511
- Developed Countries	16,9	8,7	14,4	97,8	95,0	46 316	12,2	11,7	8,6	83,1	72,8	101 546
- EC[a]	19,8	8,9	13,8	52,9	50,9	24 842	14,2	11,1	9,9	36,0	32,2	44 872
- Northamerica	13,7	1,7	10,9	16,6	12,0	5 859	15,1	8,8	- 2,0	12,8	8,1	11 300
- Developing Countries	29,3	38,9	50,8	0,8	3,5	1 715	7,3	11,4	32,3	13,4	21,1	29 390
- Socialist Countries	27,4	16,0	10,3	1,4	1,5	745	11,9	30,5	16,6	3,6	6,2	8 575
Consumer Goods Industries												
World	12,5	17,2	12,3	100,0	100,0	32 916	13,0	14,0	13,5	100,0	100,0	28 635
- Developed Countries	12,0	15,2	9,9	86,2	76,7	25 255	13,4	13,9	12,6	91,7	89,2	25 550
- EC[a]	13,9	14,4	6,4	63,0	49,9	16 436	17,8	14,8	13,9	47,6	49,1	14 069
- Northamerica	11,2	7,9	17,9	2,8	2,6	843	9,3	- 0,4	1,4	8,4	4,0	1 138
- Developing Countries	13,4	26,3	23,9	10,6	17,9	5 875	6,4	9,3	23,5	5,8	6,6	1 893
- Socialist Countries	26,4	33,5	17,0	3,3	5,4	1 787	28,7	27,1	21,2	2,5	4,2	1 193
Food, Beverages and Tobacco Industries												
World	8,7	12,8	7,8	100,0	100,0	16 368	16,5	26,2	14,3	100,0	100,0	9 250
- Developed Countries	8,8	13,9	10,2	72,4	79,7	13 049	18,3	25,5	15,9	84,5	87,0	8 043
- EC[a]	14,5	13,0	9,6	52,3	55,3	9 043	24,8	27,0	14,9	57,3	59,4	5 492
- Northamerica	0,9	13,7	0,2	7,3	6,0	986	10,0	8,5	7,5	5,2	2,7	252
- Developing Countries	7,8	9,8	- 1,5	20,6	14,5	2 379	9,4	18,1	28,1	9,5	10,9	1 007
- Socialist Countries	11,0	9,3	4,0	7,0	5,7	940	9,4	45,5	-28,3	5,7	2,2	200

[a] Old EC of the six.

Source: Statistisches Bundesamt, Fachserie 7, Außenhandel, Reihe 7: Außenhandel nach Ländern und Warengruppen der Industriestatistik (Spezialhandsl), Stuttgart und Mainz, various Issues. - Own Calculations.

Table A 4.2 - Imports and Exports from Industrialised Countries and Developing Countries by Industries in Per Cent of Manufacturing Exports and Imports, Federal Republic of Germany, 1962 and 1976 (p.c.)

Industry \ Year	Trade with MDCs				Trade with LDCs			
	Imports		Exports		Imports		Exports	
	1962	1976	1962	1976	1962	1976	1962	1976
Primary and intermediate goods ind.	40.5	38.3	28.6	27.4	47.4	24.7	28.2	20.9
Stones and earthen goods ind.	2.5	1.6	0.9	0.9	1.2	0.4	0.6	0.8
Iron and steel ind.	8.7	6.1	8.5	5.2	0.1	1.5	5.3	3.1
Foundries	0.3	0.2	0.3	0.3	0.0	0.0	0.3	0.4
Cold rolling mills	0.4	0.7	1.1	0.9	0.0	0.0	1.3	0.6
Non-ferrous metal ind.	7.1	4.8	2.1	2.4	26.0	9.6	1.1	1.1
Mineral oil ind.	2.7	6.3	1.3	1.0	14.3	6.3	0.2	0.2
Chemical ind.	9.3	12.2	12.1	13.8	3.1	3.1	17.9	13.7
Sawmills and woodwork ind.	2.9	1.1	0.4	0.6	2.5	3.1	0.1	0.1
Pulp, paper, paperboard ind.	5.3	3.8	0.7	1.0	0.1	0.2	0.3	0.3
Rubber and asbestos man. ind.	1.1	1.5	1.0	1.3	0.3	0.5	1.3	0.6
Capital goods ind.	26.9	33.8	58.3	54.6	0.8	12.9	64.3	72.0
Structural and light metal eng.	0.4	0.5	0.9	0.8	0.0	0.0	2.7	2.9
Mechanical engineering	11.8	7.2	23.5	16.4	0.1	0.8	25.6	28.8
Man. of road vehicles	3.9	7.8	14.4	15.7	0.0	1.5	14.1	18.5
Shipbuilding	0.3	0.6	1.5	1.3	0.0	0.2	2.1	3.5
Aircraft man.	1.7	1.9	0.3	1.1	0.3	0.2	0.1	0.4
Electrical engineering	5.3	8.5	9.5	10.6	0.2	6.5	10.8	12.5
Precision and optical goods, watches	1.2	2.0	2.8	2.2	0.1	1.4	2.5	1.7
Steel processing	0.5	0.5	1.1	1.0	0.0	0.1	0.9	0.6
Iron, sheet and metal goods ind.	1.9	2.5	4.3	3.5	0.2	1.0	5.4	2.4
Office machines and data proc.	.[a]	2.3	.[a]	2.0	.[a]	1.3	.[a]	0.7
Consumer goods ind.	32.5	27.9	13.1	18.0	51.8	62.4	7.5	7.1
Fine ceramics ind.	0.3	0.6	1.0	0.7	0.0	0.2	0.4	0.2
Glass and glass prod. ind.	0.5	0.8	1.0	0.7	0.0	0.1	0.6	0.3
Woodwork man. ind.	0.9	1.1	0.7	1.2	0.6	1.1	0.3	0.6
Musical instr., toys, sport. goods ind.	1.0	1.0	1.3	1.0	0.9	3.2	0.6	0.3
Pulp and paper man. ind.	0.4	0.6	0.3	0.6	0.0	0.2	0.2	0.3
Printing and publishing	0.5	0.5	0.7	0.8	0.0	0.2	0.3	0.2
Plastics prod. ind.	0.4	1.7	0.5	2.1	0.1	0.6	0.3	0.6
Leather ind.	0.9	0.5	0.3	0.2	1.1	1.1	0.2	0.0
Leather man. ind.	0.2	0.3	0.3	0.1	0.2	1.7	0.2	0.0
Shoe ind.	0.8	1.3	0.2	0.3	0.1	1.1	0.0	0.1
Textile ind.	11.6	7.0	4.2	4.4	12.4	16.3	2.3	1.8
Clothing ind.	2.0	3.0	0.9	1.6	2.7	18.9	0.2	0.2
Food, beverages, tobacco	13.0	9.5	1.8	4.3	33.5	18.0	1.7	2.5
Manufacturing	100	100	100	100	100	100	100	100

[a] Included in electrical and mechanical engineering.

Source: Statistisches Bundesamt, Fachserie G, Reihe 7.

Table A 4.3 - Production, Domestic Apparent Consumption, Imports and Exports by Industry in p.c. of Total Manufacturing, Federal Republic of Germany, 1962 and 1976 (p.c.)

Industry \ Year	Production		Domestic Apparent Consumption		Imports		Exports	
	1962	1976	1962	1976	1962	1976	1962	1976
Primary and intermediate goods ind.	32.0	30.5	31.2	33.3	42.4	38.1	29.3	27.2
Stones and earthen goods ind.	2.9	2.5	3.5	2.8	2.4	1.5	0.8	0.9
Iron and steel ind.	7.9	5.0	6.1	5.0	8.0	5.7	8.4	5.8
Foundries	1.4	0.9	1.4	0.9	0.2	0.2	0.3	0.3
Cold rolling mills	1.5	1.0	1.1	0.9	0.3	0.7	1.4	1.0
Non-ferrous metal ind.	2.2	2.0	2.6	2.7	9.6	5.4	2.1	2.1
Mineral oil ind.	3.1	4.5	3.9	6.3	4.3	7.2	1.1	0.8
Chemical ind.	9.1	11.4	8.0	10.6	8.5	11.2	13.2	13.8
Sawmills and woodwork ind.	1.1	0.9	1.5	1.2	3.5	1.4	0.4	0.5
Pulp, paper, paperboard ind.	1.4	1.0	1.8	1.6	4.6	3.4	0.6	0.9
Rubber and asbestos man. ind.	1.4	1.3	1.3	1.3	1.0	1.4	1.0	1.1
Capital goods ind.	34.4	40.2	30.6	32.3	23.3	30.8	58.8	57.2
Structural and light metal eng.	2.2	2.0	2.3	1.9	0.4	0.5	1.2	1.2
Mechanical engineering	9.9	11.1	8.4	7.4	10.2	6.5	24.0	19.7
Man. of road vehicles	6.5	9.1	5.4	6.5	3.4	6.9	13.8	15.4
Shipbuilding	1.0	0.9	0.6	0.6	0.2	0.6	1.7	1.6
Aircraft man.	0.1	0.3	0.3	0.4	1.5	1.7	0.2	0.9
Electrical engineering	8.1	9.9	7.8	9.6	4.6	8.0	9.6	10.6
Precision and optical goods, watches	1.0	1.2	0.7	1.1	1.0	1.8	2.7	2.1
Steel processing	1.6	1.4	3.5	1.3	0.4	0.4	1.0	0.9
Iron, sheet and metal goods ind.	4.0	3.7	1.4	3.6	1.6	2.3	4.6	3.1
Office machines and data proc.	.[a]	0.6	.[a]	0.5	.[a]	2.1	.[a]	1.7
Consumer goods ind.	33.6	29.3	38.2	34.4	34.3	31.1	11.9	15.6
Fine ceramics ind.	0.6	0.5	0.5	0.4	0.3	0.6	0.9	0.6
Glass and glass prod. ind.	0.8	0.8	0.8	0.9	0.4	0.8	0.9	0.6
Woodwork man. ind.	2.0	2.5	2.3	2.7	0.9	1.2	0.6	1.1
Musical instr., toys, sport. goods ind.	0.5	0.4	0.4	0.5	1.0	1.2	1.1	0.8
Pulp and paper man. ind.	1.2	1.5	1.4	1.6	0.3	0.6	0.3	0.5
Printing and publishing	1.6	1.9	1.8	1.9	0.5	0.4	0.7	0.7
Plastics prod. ind.	0.9	2.1	1.1	2.1	0.4	1.5	0.5	1.8
Leather ind.	0.5	0.1	0.5	0.2	0.9	0.5	0.3	0.2
Leather man. ind.	0.4	0.2	0.4	0.3	0.2	0.4	0.2	0.1
Shoe ind.	0.9	0.4	1.0	0.7	0.7	1.3	0.1	0.2
Textile ind.	6.5	3.7	7.1	4.4	11.3	7.8	3.7	3.9
Clothing ind.	3.1	2.2	3.7	3.0	2.0	4.6	0.7	1.3
Food, beverages, tobacco	14.6	13.0	17.4	15.7	15.5	10.3	1.9	3.8
Manufacturing	100	100	100	100	100	100	100	100

[a] Included in mechanical and electrical engineering.

Source: Statistisches Bundesamt, Statistisches Jahrbuch, var. iss.

Table A 4.4 - Average annual percentage change of contribution to GDP[a], employment and labour productivity by sector and for total economy, Federal Republic of Germany, 1950-1977 at constant prices[b]

	1950-1977	1950-1960	1960-1970	1970-1977	1970-1973	1973-1977
	Average annual percentage change					
Total Economy						
- Contribution to GDP	5,3	8,0	4,7	2,5	3,9	1,5
- Employment	0,6	2,1	+0,2	-1,0	0,1	-1,7
- Labour Productivity	4,7	5,8	4,5	3,5	3,8	3,3
Primary Sector						
- Contribution to GDP	1,7	3,2	0,8	0,9	3,8	-1,2
- Employment	-3,9	-3,0	-4,5	-4,1	-4,8	-4,1
- Labour Productivity	5,8	6,4	5,5	5,2	9,0	3,0
Secondary Sector						
- Contribution to GDP	6,1	10,0	5,2	2,0	3,8	0,7
- Employment	+0,9	3,4	0,4	-1,9	-0,5	-2,8
- Labour Productivity	5,2	6,4	4,8	4,0	4,3	3,6
Tertiary Sector						
- Contribution to GDP	5,1	7,3	4,5	3,1	4,0	2,5
- Employment	+1,8	3,3	1,3	0,7	1,7	-0,1
- Labour Productivity	3,2	3,9	3,2	2,4	2,3	2,6
Manufacturing						
- Contribution to GDP	6,7	11,0	5,8	2,2	3,5	1,3
- Employment	1,1	3,7	0,6	-1,7	-0,6	-2,6
- Labour Productivity	5,5	7,0	5,2	4,0	4,1	4,0
Community, Social and Personal Services						
- Contribution to GDP	4,2	4,6	3,7	3,2	4,3	2,5
- Employment	-	2,1	3,6	-	3,8	-
- Labour Productivity	-	2,4	0,1	-	0,5	-

[a] Total economy: contribution to GDP equal to GDP; sectors: contribution to GDP equal to Gross Value Added. -
[b] Figures previous to 1960 are not strictly comparable to figures for later years: 1950 to 1960 at 1962 prices, 1960 to 1977 at 1970 prices; 1950 to 1960 excluding the Saar and West-Berlin; additional differences in concept.

Source: See table 2.

Table A 4.5 - Average annual percentage change of contribution to GDP and labour productivity by sector, Federal Republic of Germany, 1950-1977 at relative prices[a,b,c]

	1950-1977	1950-1960	1960-1970	1970-1977	1970-1973	1973-1977
	Average annual percentage change					
Primary Sector						
- Contribution to GDP	0,1	2,4	-0,8	-2,1	1,3	-4,6
- Labour Productivity	4,2	5,6	3,9	2,1	6,4	-0,5
Secondary Sector						
- Contribution to GDP	5,1	9,0	4,6	0.5	2,2	-0,7
- Labour Productivity	4,2	5,4	4,2	2,4	2,7	2,2
Tertiary Sector						
- Contribution to GDP	5,9	7,8	5,5	3,7	6,0	2,1
- Labour Productivity	4,0	4,4	4,1	3,0	4,2	2,2
Manufacturing						
- Contribution to GDP	5,1	8,8	4,8	0,5	1,5	-0,3
- Labour Productivity	4,0	4,9	4,2	2,2	2,1	2,4
Community, Social and Personal Services						
- Contribution to GDP	6,4	6,9	6,7	5,2	8,5	2,9
- Labour Productivity	-	4,7	3,0	-	4,5	-

[a]Growth rate of contribution to GDP at current prices divided by growth rate of GDP deflation. - [b]Growth rate of contribution to GDP at relative prices divided by growth rate of employment. - [c]1950-1960: excluding the Saar and West-Berlin.

Source: See table 2.

Table A 4.6 - Regression Equations for Apparent Consumption (AC) by Industry, 1962-1976 (1970 prices)

No.	Industry	Regression Equation				$\bar{R}^2$
(1)	Primary and Intermediate Goods Industries	LAC 1	= -2.72624	-1.01397 L RPP (4.264)	+1.25954 L GDP (238.512)	0.96
(2)	Stones and Earthern Goods	LAC 2	= -1.87276	+2.21156 L RPP (68.367)	+1.02825 L GDP (531.316)	0.98
(3)	Iron and Steel Industry	LAC 3	= -2.68651	-0.23273 L RPP (0.119)	+1.12155 L GDP (44.435)	0.76
(4)	Foundries	LAC 4	= 2.11094	-1.21812 L RPP (2.408)	+0.64354 L GDP (1.041)	0.08
(5)	Cold Rolling Mills	LAC 5	= 1.65000	-0.64691 L RPP (0.967)	+0.67567 L GDP (3.852)	0.21
(6)	Non Ferrous Metals	LAC 6	= -5.43537	-0.14844 L RPP (2.278)	+1.29384 L GDP (180.102)	0.93
(7)	Chemical Industry	LAC 7	=-15.21189	+0.29591 L RPP (1.202)	+2.09628 L GDP (351.554)	0.99
(8)	Sawmills and Woodwork Industry	LAC 8	= -3.62582	+0.89997 L RPP (2.959)	+1.08615 L GDP (53.936)	0.85
(9)	Pulp, Paper and Paper Board Industry	LAC 9	= -0.53484	-0.75456 L RPP (5.850)	+0.87357 L GDP (82.981)	0.92
(10)	Rubber and Asbestos Manufacturing Industry	LAC 10	= -3.53781	-1.60824 L RPP (17.821)	+1.08525 L GDP (75.011)	0.89
(11)	Capital Goods Industries	LAC 11	= -1.36750	+2.20797 L RPP (10.931)	+1.16112 L GDP (142.058)	0.98
(12)	Structural and Light Metal Engineering	LAC 12	= 3.51169	+1.03738 L RPP (2.395)	+0.59545 L GDP (1.541)	0.64
(13)	Mechanical Engineering	LAC 13	= 3.72460	+0.08608 L RPP (0.004)	+0.67300 L GDP (1.334)	0.62
(14)	Manufacturing of Road Vehicles	LAC 14	= -6.57164	+1.12297 L RPP (0.656)	+1.41356 L GDP (78.030)	0.86
(15)	Electrical Engineering	LAC 15	=-14.80925	+0.27191 L RPP (0.058)	+2.06896 L GDP (425.834)	0.99
(16)	Precision and Optical Goods, Watches	LAC 16	=-16.87467	-0.40286 L RPP (0.356)	+2.04787 L GDP (154.289)	0.97
(17)	Steel Processing, Iron, Sheet and Metal Goods Industry	LAC 17	= -2.70152	-0.30754 L RPP (0.119)	+1.12024 L GDP (34.956)	0.92
(18)	Consumer Goods Industries	LAC 18	= -0.13114	-0.02148 L RPP (0.004)	+1.02948 L GDP (203.644)	0.94
(19)	Fine Ceramics Industry	LAC 19	= -0.55549	+0.69385 L RPP (0.296)	+0.77785 L GDP (4.144)	0.76
(20)	Glass and Glass Producing Industry	LAC 20	= -4.86862	+1.31349 L RPP (17.629)	+1.15588 L GDP (315.662)	0.98
(21)	Woodwork Manufacturing Industry	LAC 21	= -7.65355	+0.31337 L RPP (0.202)	+1.43956 L GDP (156.631)	0.96
(22)	Musical Instruments, Toys, Sports Goods Industry	LAC 22	=-24.22155	-3.84621 L RPP (19.701)	+2.55261 L GDP (65.269)	0.90
(23)	Pulp and Paper Manufacturing Industry	LAC 23	= -3.60925	-0.73349 L RPP (18.845)	+1.09956 L GDP (108.410)	0.93
(24)	Printing and Publishing	LAC 24	= -7.28531	-0.89920 L RPP (4.206)	+1.38730 L GDP (121.161)	0.96
(25)	Plastic Products Industry	LAC 25	=-16.84096	-1.86788 L RPP (10.564)	+2.09177 L GDP (69.848)	0.99
(26)	Leather Industry	LAC 26	= 26.69670	+0.01912 L RPP (0.002)	-1.30268 L GDP (65.334)	0.84
(27)	Leather Manufacturing Industry	LAC 27	= -2.59683	-0.97009 L RPP (1.718)	+0.90636 L GDP (3.571)	0.25
(28)	Coke Industry	LAC 28	= 14.99581	+0.02912 L RPP (0.001)	-0.33496 L GDP (0.799)	0.05

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(29)	Textile Industry	LAC 29 = 5.86512 -0.11000 L RPP (0.020) +0.48640 L GDP (6.324)	0.48
(30)	Clothing Industry	LAC 30 = -1.23351 +0.66938 L RPP (1.616) +0.98039 L GDP (193.867)	0.94
(31)	Food, Beverages, Tobacco	LAC 31 = -0.02076 +0.54969 L RPP (3.150) +1.00622 L GDP (476.585)	0.98

Table A 1.7 - Regression Equations for Total Imports (TI) by Industry, 1962-1976 (1970 prices)

No.	Industry	Regression Equation	$\bar{R}^2$
(1)	Primary and Intermediate Goods Industries	LTI 1 = -13.16535 +0.28629 L RIP (0.892) +1.92265 L GDP (357.071)	0.98
(2)	Stones and Earthern Goods	LTI 2 = -10.96759 -0.49457 L RIP (5.564) +1.53177 L GDP (525.744)	0.98
(3)	Iron and Steel Industry	LTI 3 = -13.43008 +0.95590 L RIP (1.938) +1.81262 L GDP (123.761)	0.92
(4)	Foundries	LTI 4 = -23.50735 -0.97867 L RIP (4.480) +2.29858 L GDP (30.717)	0.91
(5)	Cold Rolling Mills	LTI 5 = -55.63968 +1.24228 L RIP (1.999) +4.77351 L GDP (43.393)	0.97
(6)	Non Ferrous Metals	LTI 6 = -4.33458 -0.32622 L RIP (0.555) +1.15577 L GDP (29.308)	0.77
(7)	Chemical Industry	LTI 7 = -31.29336 -0.63755 L RIP (1.608) +3.17199 L GDP (969.535)	0.99
(8)	Sawmills and Woodwork Industry	LTI 8 = -8.59433 -1.66781 L RIP (8.047) +1.35717 L GDP (14.339)	0.49
(9)	Pulp, Paper and Paper Board Industry	LTI 9 = -12.65369 -0.59110 L RIP (1.933) +1.70602 L GDP (122.465)	0.94
(10)	Rubber and Asbestos Manufacturing Industry	LTI 10 = -29.64546 -0.32618 L RIP (1.744) +2.89694 L GDP (379.841)	0.97
(11)	Capital Goods Industries	LTI 11 = -31.33162 -0.26199 L RIP (0.589) +3.25219 L GDP (287.773)	0.99
(12)	Structural and Light Metal Engineering	LTI 12 = -31.86959 -3.19416 L RIP (4.848) +2.97650 L GDP (12.171)	0.92
(13)	Mechanical Engineering	LTI 13 = -19.65203 +1.10655 L RIP (8.850) +2.28496 L GDP (98.046)	0.96
(14)	Manufacturing of Road Vehicles	LTI 14 = -42.61663 +0.76267 L RIP (1.259) +3.97152 L GDP (356.983)	0.97
(15)	Electrical Engineering	LTI 15 = -41.50442 -0.90403 L RIP (6.428) +3.90238 L GDP (337.606)	0.99
(16)	Precision and Optical Goods, Watches	LTI 16 = -30.18431 -1.28192 L RIP (4.050) +2.94761 L GDP (32.901)	0.99
(17)	Steel Processing, Iron, Sheet and Metal Goods Industry	LTI 17 = -29.22671 -0.34481 L RIP (0.422) +2.91669 L GDP (289.895)	0.99
(18)	Consumer Goods Industries	LTI 18 = -23.02328 -1.11967 L RIP (2.856) +2.60478 L GDP (581.158)	0.99
(19)	Fine Ceramics Industry	LTI 19 = -21.30927 -2.27708 L RIP (4.899) +2.19837 L GDP (7.397)	0.95
(20)	Glass and Glass Producing Industry	LTI 20 = -51.82697 +1.23769 L RIP (1.890) +4.50229 L GDP (76.468)	0.98
(21)	Woodwork Manufacturing Industry	LTI 21 = -34.51130 -1.56889 L RIP (5.126) +3.24156 L GDP (49.046)	0.89
(22)	Musical Instruments, Toys, Sports Goods Industry	LTI 22 = -21.02483 -0.81594 L RIP (1.344) +2.24382 L GDP (121.205)	0.90
(23)	Pulp and Paper Manufacturing Industry	LTI 23 = -26.14883 -2.03697 L RIP (3.548) +2.55623 L GDP (8.791)	0.96
(24)	Printing and Publishing	LTI 24 = -29.96129 +0.98665 L RIP (0.952) +2.83715 L GDP (31.638)	0.96
(25)	Plastic Products Industry	LTI 25 = -75.29077 +1.83962 L RIP (5.410) +6.28420 L GDP (1496.542)	0.99
(26)	Leather Industry	LTI 26 = -7.51966 -0.50167 L RIP (1.063) +1.18304 L GDP (29.636)	0.75
(27)	Leather Manufacturing Industry	LTI 27 = -38.33304 -0.95895 L RIP (1.256) +3.42966 L GDP (16.240)	0.93
(28)	Shoe Industry	LTI 28 = -21.49009 -1.28024 L RIP (0.436) +2.27343 L GDP (6.827)	0.87

Table A 4.7

(29)	Textile Industry	LTI 29 = -14.66540 -0.55007 L RIP (0.234) +1.92037 L GDP (290.193)	0.96
(30)	Clothing Industry	LTI 30 = -44.08779 -0.34460 L RIP (0.113) +4.04236 L GDP (543.194)	0.98
(31)	Food, Beverages, Tobacco	LTI 31 = -14.00363 -1.40615 L RIP (53.351) +1.89355 L GDP (1244.324)	0.99

Table A 4.8 - Regression Equations for Total Exports (TE) by Industry, 1962-1976 (1970 prices)

No.	Industry	Regression Equation	$\bar{R}^2$
(1)	Primary and Intermediate Goods Industries	TE 1 = -224977,8 +5634,27 WP (642,935)	0.98
(2)	Stones and Earthern Goods	LTE 2 = 1.83083 +1.58554 L WP (663.985)	0.98
(3)	Iron and Steel Industry	LTE 3 = 5.41069 +1.28333 L WP (74.045)	0.84
(4)	Foundries	LTE 4 = -2.77552 +2.33189 L WP (53.412)	0.87
(5)	Cold Rolling Mills	LTE 5 = 2.46985 +1.54472 L WP (122.425)	0.90
(6)	Non Ferrous Metals	LTE 6 = 3.94073 +1.39621 L WP (127.892)	0.90
(7)	Chemical Industry	LTE 7 = 2.45613 +2.07067 L WP (799.847)	0.98
(8)	Sawmills and Woodwork Industry	LTE 8 = 0.69760 +1.65605 L WP (163.523)	0.92
(9)	Pulp, Paper und Paper Board Industry	LTE 9 = -2.12527 +2.41031 L WP (249.731)	0.95
(10)	Rubber and Asbestos Manufacturing Industry	LTE 10 = -1.43047 +2.35834 L WP (1750.519)	0.99
(11)	Capital Goods Industries	LTE 11 = 6.35984 +1.52991 L WP (2853.336)	0.99
(12)	Structural and Light Metal Engineering	LTE 12 = 0.46046 +1.89820 L WP (13.415)	0.18
(13)	Mechanical Engineering	LTE 13 = 7.48382 +1.06959 L WP (363.904)	0.96
(14)	Manufacturing of Road Vehicles	LTE 14 = 4.18031 +1.70378 L WP (628.192)	0.98
(15)	Electrical Engineering	LTE 15 = 2.41901 +2.01062 L WP (1714.891)	0.99
(16)	Precision and Optical Goods, Watches	LTE 16 = 5.21601 +1.08485 L WP (381.638)	0.96
(17)	Steel Processing, Iron, Sheet and Metal Goods Industry	LTE 17 = 5.57207 +1.16769 L WP (135.261)	0.91
(18)	Consumer Goods Industries	LTE 18 = 2.78010 +1.95257 L WP (2324.654)	0.99
(19)	Fine Ceramics Industry	LTE 19 = 7.10635 +0.41589 L WP (4.885)	0.33
(20)	Glass and Glass Producing Industry	LTE 20 = 3.48611 +1.19975 L WP (243.291)	0.95
(21)	Woodwork Manufacturing Industry	LTE 21 = -1.63108 +2.35316 L WP (1447.054)	0.99
(22)	Musical Instruments, Toys, Sports Goods Industry	LTE 22 = 7.07951 +0.46649 L WP (41.426)	0.74
(23)	Pulp and Paper Manufacturing Industry	LTE 23 = -2.70703 +2.43641 L WP (287.453)	0.97
(24)	Printing and Publishing	LTE 24 = 3.63791 +1.17553 L WP (453.914)	0.97
(25)	Plastic Products Industry	LTE 25 = -10.24941 +4.30630 L WP (372.766)	0.96
(26)	Leather Industry	LTE 26 = 5.11226 +0.57707 L WP (18.240)	0.55
(27)	Leather Manufacturing Industry	LTE 27 = 9.35179 -0.37959 L WP (2.323)	0.14
(28)	Shoe Industry	LTE 28 = 5.78193 +0.46843 L WP (2.231)	0.13

Table A 4.5

(29)	Textile Industry	LTE 29 = 0.87205 +2.13757 L WP (1779.528)	0.99
(30)	Clothing Industry	LTE 30 = -0.97803 +2.24617 L WP (829.503)	0.98
(31)	Food, Beverages, Tobacco	LTE 31 = -3.66717 +3.05209 L WP (1056.105)	0.99

Table A 4.9 - Values for Exogenous Variables, 1990

Gross Domestic Product, - Federal Republic of Germany (Mio. DM)	1277,3
- World (1970 = 100)	242
- Developing Countries (1970 = 100)	313

Relative Prices

Industry[a] No.	Producerprices	Importprices	Industry[a] No.	Producerprices	Importprices
1	0.9715	1.1355	17	1.1292	0.7834
2	0.9681	1.1077	18	0.9537	0.9433
3	0.9596	1.0152	19	1.1718	0.6250
4	1.6473	0.5596	20	1.0633	0.5936
5	1.2347	0.5114	21	1.0714	1.4255
6	0.6871	1.2967	22	1.3658	1.0699
7	0.7637	1.0299	23	1.3745	0.6488
8	0.8203	1.4883	24	1.2117	0.6879
9	0.9215	1.2570	25	0.7517	0.9236
10	0.9777	0.7705	26	1.1110	1.3104
11	1.0559	0.6627	27	1.4059	0.6022
12	1.2638	0.7102	28	1.2361	0.7678
13	1.3848	0.6345	29	0.8561	0.9689
14	1.0503	0.8737	30	0.9423	1.0810
15	0.8087	0.6535	31	0.9262	1.1010
16	1.1244	0.4442			

[a]For classification of industries see table A6.

Table A 4.30 - Regression Equations for Imports from Developing Countries (DI) by Industry, 1962-1976 (1970 prices)

No.	Industry	Regression Equation	$\bar{R}^2$
(1)	Primary and Intermediate Goods Industries	LDI 1 = 9.65735 +1.73946 L RIP +0.02289 L GDP (10.376) (0.016)	0.55
(2)	Stones and Earthern Goods	LDI 2 = 15.15600 +0.35727 L RIP -0.66868 L GDP (0.019) (1.635)	-0.02
(3)	Iron and Steel Industry	LDI 3 =-116.40590 -7.45974 L RIP +9.07977 L GDP (3.967) (104.403)	0.88
(4)	Foundries	LDI 4 =-135.8262 -2.52337 L RIP +10.23846 L GDP (0.457) (9.348)	0.71
(5)	Cold Rolling Mills	LDI 5 = -50.16674 -1.36230 L RIP +3.76454 L GDP (0.029) (0.328)	0.29
(6)	Non Ferrous Metals	LDI 6 = 8.40962 -0.32870 L RIP +0.63443 L GDP (0.180) (0.050)	-0.15
(7)	Chemical Industry	LDI 7 = -26.10724 -0.59478 L RIP +2.51374 L GDP (0.846) (368.049)	0.96
(8)	Sawmills and Woodwork Industry	LDI 8 = -22.56611 -0.64375 L RIP +2.24379 L GDP (0.560) (18.304)	0.60
(9)	Pulp, Paper and Paper Board Industry	LDI 9 = -1.22499 +4.78431 L RIP +0.38493 L GDP (4.721) (0.232)	0.46
(10)	Rubber and Asbestos Manufacturing Industry	LDI 10 = -7.89794 -1.46776 L RIP +0.97243 L GDP (1.353) (1.640)	0.16
(11)	Capital Goods Industries	LDI 11 = -58.06258 -5.22266 L RIP +4.89989 L GDP (13.391) (37.402)	0.96
(12)	Structural and Light Metal Engineering	LDI 12 = -66.72021 -7.08093 L RIP +5.05298 L GDP (0.183) (0.270)	0.07
(13)	Mechanical Engineering	LDI 13 = -78.92419 +3.37035 L RIP +6.30596 L GDP (2.377) (21.618)	0.82
(14)	Manufacturing of Road Vehicles	LDI 14 =-158.8240 -9.39019 L RIP +12.16829 L GDP (12.193) (214.046)	0.96
(15)	Electrical Engineering	LDI 15 = -99.57455 -3.30332 L RIP +7.93043 L GDP (6.406) (104.061)	0.97
(16)	Precision and Optical Goods, Watches	LDI 16 = -33.03474 -7.51761 L RIP +2.86010 L GDP (5.558) (1.236)	0.94
(17)	Steel Processing, Iron Sheet and Metal Goods Industry	LDI 17 = -43.63493 -6.41974 L RIP +3.65718 L GDP (4.762) (14.826)	0.89
(18)	Consumer Goods Industries	LDI 18 = -32.61918 -2.29920 L RIP +3.16464 L GDP (1.733) (123.474)	0.94
(19)	Fine Ceramics Industry	LDI 19 = -73.66180 -10.77251 L RIP +5.68799 L GDP (1.263) (0.570)	0.74
(20)	Glass and Glass Producing Industry	LDI 20 = -68.55600 -5.03967 L RIP +5.35472 L GDP (1.541) (5.321)	0.92
(21)	Woodwork Manufacturing Industry	LDI 21 = -20.63964 -0.26964 L RIP +2.00050 L GDP (0.090) (11.129)	0.74
(22)	Musical Instruments, Toys, Sports Goods Industry	LDI 22 = -38.81989 -0.43591 L RIP +3.42751 L GDP (0.359) (264.656)	0.95
(23)	Pulp and Paper Manufacturing Industry	LDI 23 =-245.6970 +10.03892 L RIP +18.52129 L GDP (2.751) (14.735)	0.85
(24)	Printing and Publishing	LDI 24 = -53.67514 +2.54503 L RIP +4.24891 L GDP (0.735) (8.235)	0.83
(25)	Plastic Products Industry	LDI 25 = -75.98616 -0.72305 L RIP +6.06041 L GDP (0.423) (705.298)	0.98
(26)	Leather Industry	LDI 26 = -11.20302 +0.71713 L RIP +1.32066 L GDP (0.597) (10.102)	0.64
(27)	Leather Manufacturing Industry	LDI 27 = -84.97028 -1.50359 L RIP +6.78572 L GDP (3.704) (75.652)	0.99
(28)	[illegible] Industry	LDI 28 = [illegible] +10.[illegible] L RIP +11.13925 L GDP ([illegible]) (18.506)	0.83

Table A 4.10

(29)	Textile Industry	LDI 29 = -21.43825 -1.76752 L RIP +2.27587 L GDP (0.830) (140.015)	0.93
(30)	Clothing Industry	LDI 30 = -60.70380 +1.15037 L RIP +5.15867 L GDP (0.191) (133.844)	0.92
(31)	Food, Beverages, Tobacco	LDI 31 = -4.74702 -1.10133 L RIP +1.07926 L GDP (2.724) (33.640)	0.71

Table A 4.11 : Regression Equations for Exports to Developing Countries (DE) by Industry, 1962-1976 (1970 prices)

No.	Industry	Regression Equation	$\bar{R}^2$
(1)	Primary and Intermediate Goods Industries	LDE 1 = 4.78917 +1.28188 LDP (252.341)	0.95
(2)	Stones and Earthern Goods	LDE 2 = 4.89421 +0.01826 DP (63.914)	0.82
(3)	Iron and Steel Industry	LDE 3 = 3.59193 +1.16864 LDP (17.382)	0.54
(4)	Foundries	LDE 4 = -11.57444 +3.72623 LDP (17.203)	0.67
(5)	Cold Rolling Mills	LDE 5 = 3.99999 +0.73126 LDP (11.939)	0.46
(6)	Non Ferrous Metals	DE 6 = -530.19580 +32.01795 DP (26.089)	0.64
(7)	Chemical Industry	LDE 7 = 3.83086 +1.39508 LDP (312.549)	0.96
(8)	Sawmills and Woodwork Industry	LDE 8 = -3.05355 +1.71964 LDP (59.912)	0.81
(9)	Pulp, Paper and Paper Board Industry	LDE 9 = -2.62868 +1.92801 LDP (8.892)	0.86
(10)	Rubber and Asbestos Manufacturing Industry	LDE 10 = 2.27522 +1.07127 LDP (51.458)	0.78
(11)	Capital Goods Industries	LDE 11 = 5.24875 +1.36477 LDP (123.670)	0.90
(12)	Structural and Light Metal Engineering	DE 12 = -6383.071 +82.00415 DP (7.200)	0.44
(13)	Mechanical Engineering	LDE 13 = 5.32061 +1.15424 LDP (83.442)	0.85
(14)	Manufacturing of Road Vehicles	LDE 14 = 2.59073 +1.62055 LDP (88.063)	0.86
(15)	Electrical Engineering	LDE 15 = 2.40998 +1.59546 LDP (171.103)	0.92
(16)	Precision and Optical Goods, Watches	LDE 16 = 3.78067 +0.94578 LDP (253.023)	0.95
(17)	Steel Processing, Iron, Sheet and Metal Goods Industry	LDE 17 = 7.58657 +0.27226 LDP (6.850)	0.29
(18)	Consumer Goods Industries	LDE 18 = 3.94220 +1.10083 LDP (153.751)	0.92
(19)	Fine Ceramics Industry	LDE 19 = 4.15398 +0.45697 LDP (10.770)	0.55
(20)	Glass and Glass Producing Industry	LDE 20 = 3.89105 +0.57345 LDP (42.970)	0.75
(21)	Woodwork Manufacturing Industry	LDE 21 = 4.55499 +0.01582 DP (26.015)	0.64
(22)	Musical Instruments, Toys, Sports Goods Industry	LDE 22 = 8.33571 -0.38211 LDP (3.176)	0.13
(23)	Pulp and Paper Manufacturing Industry	LDE 23 = -2.24657 +1.76803 LDP (49.220)	0.86
(24)	Printing and Publishing	LDE 24 = 3.70066 +0.52029 LDP (71.850)	0.84
(25)	Plastic Products Industry	LDE 25 = -6.29054 +2.89052 LDP (276.413)	0.95
(26)	Leather Industry	LDE 26 = 7.19044 -0.50345 LDP (18.831)	0.56
(27)	Leather Manufacturing Industry	LDE 27 = 5.77344 -0.12162 LDP ((0.458)	-0.07

Table A 4.11

(28)	Shoe Industry	LDE 28 = -2.86079 +1.58804 LDP (50.997)	0.86
(29)	Textile Industry	LDE 29 = 1.64299 +1.40118 LDP (150.129)	0.91
(30)	Clothing Industry	LDE 30 = -0.17166 +1.29935 LDP (109.270)	0.89
(31)	Food, Beverages, Tobacco	LDE 31 = -1.49143 +2.07725 LDP (205.392)	0.94

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