

Misala, Józef

Working Paper — Digitized Version

Importance and patterns of Poland's trade with Germany

Kiel Working Paper, No. 537

Provided in Cooperation with:

Kiel Institute for the World Economy – Leibniz Center for Research on Global Economic Challenges

Suggested Citation: Misala, Józef (1992) : Importance and patterns of Poland's trade with Germany, Kiel Working Paper, No. 537, Kiel Institute of World Economics (IfW), Kiel

This Version is available at:

<https://hdl.handle.net/10419/46897>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Kieler Arbeitspapiere Kiel Working Papers

Kiel Working Paper No. 537

IMPORTANCE AND PATTERNS
OF POLAND'S TRADE WITH GERMANY

by

Józef Misala

✓

Institut für Weltwirtschaft an der Universität Kiel

The Kiel Institute of World Economics

ISSN 0342 - 0787

Institut für Weltwirtschaft
Düsternbrooker Weg 120, 2300 Kiel

Kiel Working Paper No. 537

IMPORTANCE AND PATTERNS
OF POLAND'S TRADE WITH GERMANY

by

Józef Misala

✓

October 1992

AG 4035 192 / 92
Weltwirtschaft
Kiel

The author himself, not the Kiel Institute of World Economics, is solely responsible for the contents and distribution of each Kiel Working Paper.

Since the series involves manuscripts in a preliminary form, interested readers are requested to direct criticisms and suggestions directly to the author and to clear any quotations with him.

Contents

Introduction

I. Poland and Germany as Trading Partners in the Interwar Period; an Overview

1. Value of Trade Turnover and Its Importance
2. Commodity Patterns and Intra-Industry Specialization

II. Trade Relations between Poland and Germany in 1989-1991

1. Intensity and Importance
2. Pattern of Competitiveness
3. Intra-Industry Specialization

III. Conclusions and Prospects

Annex

Bibliography

IMPORTANCE AND PATTERNS OF POLAND'S TRADE WITH GERMANY*

Introduction

Germany has been a very important trading partner of Poland since many years, even centuries. In the interwar period, e.g., Germany played by far the leading role in Poland's foreign trade and after World War II and splitting this country in two, both German states ranked among the most engaged in trade with Poland and other East and Central European countries. A unified Germany is since 1990 once again the most important trade partner of them, including Poland.

Due i.a. to the consequences of the Soviet-type political and economic system forced also upon Poland after World War II, Poland's foreign trade (imports plus exports) in percent of GDP is still low compared to western countries of a similar size. Therefore one can expect that Poland's foreign trade has to expand at a much higher rate than GDP what is equal to the question which regional pattern of trade will emerge.

Some authors [e.g. Collins, Rodrik, 1991] refer i.a. to the interwar intensities and patterns of trade in Europe when trying to draw conclusions for the future. More precisely, when attempting to predict consequences for international trade resulting from the radical political, institutional and economic changes in Eastern and Central Europe. Moreover, combining the interwar evidence with the experience of such comparator countries as Austria, Finland, Portugal or Spain seems to be convincing. On the other hand, the features of today's Germany, Poland and all the other European countries differ substantially from features of these countries in the interwar period taking into account level of development, structures of production, employment etc. There is, however, "something in the air". Moreover, addressing especially trade between Poland and Germany, the opinions are sometimes expressed that the past experiences from this "something in the air" can appear once again. Unfortunately, such attitudes influence sometimes legislation, general climate of cooperation etc.

* This paper has benefited from financial support from the EC's Action for Cooperation in the Field of Economics (ACE) in the framework of a joint research project on "Reintegration of Poland into the West European Economy by Internal and External Liberalization" undertaken by the Warsaw World Economy Research Institute, the Milan SDA Bocconi Institute and the Kiel Institute of World Economics (Grant No. 901 000 81 P.)

The author is indebted to Dr. H. Dicke and Dr. L. Orlowski for many helpful comments, as well to E. Jann and Ch. Kiesner for assistance by the preparation of statistical data, all of them from the Kiel Institute of World Economics. However, he himself is responsible for the contents of the paper.

The aim of the presented paper is to overview the development of trade relations between Poland and Germany in the interwar period and after 1988, to discuss various aspects of the intensity and patterns of division of labour between them in these times and to draw some conclusions for the future. Various aspects of Poland's trade relations with two German states before reunification are mentioned only marginally.

The paper is organized as follows. In chapter I main features of Poland's trade with Germany in the interwar period are overviewed. Then follows the presentation of the intensity and pattern of trade relations between Poland and Germany in 1989-1991. Some conclusions concerning the past and prospects of trade between these countries are presented in chapter III.

The problems of comparability and reliability of statistical data appear clearly in such a study. They are addressed more deeply in the respective parts. Nevertheless, some explanations seem to be necessary at the very beginning. First and foremost, all the data are from the Polish sources. Their main shortcoming is that coverage and definitions are not completely comparable with the data prepared in Germany. Secondly, with regard to the 1989-1991 period, disaggregated trade data consist only of statistical reports of the so-called public sector of Poland with partners from a unified Germany. Only these data are applied when using the well-known concepts of international trade theory. These shortcomings are today to be smoothened by the respective comments. Therefore, there is a necessity to repeat the analyses of trade between Poland and Germany (including private one) as soon as the appropriate data are available.

The following symbols are used throughout this paper:

- . = not available or not pertinent
- 0 = nil or negligible
- x = not possible to express.

Short texts of the Combined Nomenclature's (CN) sections and divisions are provided in the respective tables only. However, the respective CN codes are mentioned in these tables.

I. Poland and Germany as Trading Partners in the Interwar Period; an Overview

1. Value of Trade Turnover and Its Importance

As a result of general economic backwardness, low value of Gross Domestic Product (GDP), territorial changes and loss of many traditional exports' markets (especially of the Soviet market, what was due to political reasons mainly), Poland distinguished itself in the interwar years by much lower degree of involvement in the international division of labour than Germany (11 times measured as

shares in the world trade on the average). The share of the latter country (playing in the interwar period a leading role in the centrifugal system of the whole European economy) in the total Poland's foreign turnover was much higher than the share of Poland (belonging practically to the peripheries of this economy) in the total foreign turnover of Germany.

Table 1 — Share of the Trade between Poland and Germany in Their Total Trade in Selected Years of 1924-1937 (%)

Share of Germany in Poland's foreign trade								Share of Poland in Germany's foreign trade							
Imports				Exports				Imports				Exports			
1924	1928	1933	1937	1924	1928	1933	1937	1924	1928	1933	1937	1924	1928	1933	1937
34.4	26.9	17.6	14.5	43.2	34.3	17.7	14.9	4.6	2.5	1.3	1.2	4.4	3.3	1.3	1.3

Source: Bozyk, Wojciechowski [1971]; Raport [1950]; GUS [1939]; Blahut [1975].

Trade interdependence between Poland and Germany decreased clearly in the interwar period as the growth rates of mutual turnover were on the average much lower than the growth rates of their total foreign turnover. However, exceptions from this rule appeared in some years and sub-periods.

Table 2 — Value and Dynamics of Trade between Poland and Germany in 1922-1938 (thousands of Polish zlotys of that period and %, current prices)^a

	Poland's imports		Poland's exports	
	Value	Earlier year = 100	Value	Earlier year = 100
1922	312 499	x	324 299	x
1923	487 000	155.8	604 599	186.4
1924	506 269	104.0	536 128	88.7
1925	504 933	99.7	544 839	101.6
1926	366 084	72.5	572 450	105.1
1927	736 712	200.9	804 706	140.6
1928	903 128	122.6	858 761	106.7
1929	850 408	94.2	877 122	102.1
1930	605 755	71.2	626 626	71.4
1931	359 226	59.3	315 299	50.3
1932	173 119	48.2	175 903	55.8
1933	115 694	84.2	167 790	95.4
1934	108 471	74.5	161 596	96.3
1935	123 909	114.2	139 907	86.6
1936	142 885	115.3	145 333	103.9
1937	182 166	127.5	173 019	119.1
1938	299 366	164.3	285 812	165.2

^a Comparable data for 1919-1921 are not available.

Source: Blahut [1975].

Another characteristic feature of trade between Poland and Germany in the interwar years was its clearly unstable development. Four sub-periods could be distinguished:

- a) period of visible great changes of the turnovers' rates of growth in the years of reconstruction and stabilization efforts in Poland after World War I (1919-1925);
- b) period of relatively speedy development of the turnover in the years of economic recovery and stabilization in Poland (1926-1928);
- c) period of absolute decrease of the turnovers' value in the years of world economic crisis (1929-1934);
- d) period of renewed but relatively slow growth of turnover in the years of economic recovery after the crisis and of some improvement of political climate of economic cooperation (1935-1938).¹

Balance of trade between Poland and Germany changed periodically. However, respective deficits and surpluses of partners were as a rule relatively small and this was mainly due to the efforts of these countries to balance the bilateral exchange and to reduce effective payments in currencies, especially in convertible ones.

2. Commodity Pattern and Intra-Industry Specialization

The commodity pattern of Poland's total foreign trade in the interwar period, and especially of the turnover with Germany, reflected typical features of trade between countries which differ in their level of national income (overall and per capita), and in industrialization. High processed industrial products dominated clearly in Poland's imports, while in its exports the products with a low value-added ranked among the most important.

Processed industrial products were of special importance in imports of the so-called II Polish Republic (II Rzeczpospolita). It was on the average 61.1 % of Poland's imports which originated from Germany in 1923-1938. These products were followed by raw resources and semi-finished products (33.0 %), and by food and beverages (5.2 %). Interestingly, the share of finished industrial products in Poland's imports from Germany was especially high in the first and in the last of the above mentioned sub-periods, i.e. in the years of reconstruction and stabilization efforts in Poland after World War II, and in the years of economic recovery after the world economic crisis and some improvement of political climate.

¹ Details are to be found i.a. in: Blahut [1975]; Bozyk, Wojciechowski [1971]; BR [1962]; Kostrowicka, Landau, Tomaszewski [1975]; Krasuski [1964]; Raport [1950]; Scherfke [1936]; Strobel [1990].

Poland's exports to Germany were also one-sided in the interwar period, however, with a leading role of raw resources and semi-finished products (on the average 63.3 % of the respective exports). These products were followed by food and beverages (22.7 % respectively), finished industrial products (8.7 %) and by live animals (5.3 %). Generally, the common share of raw resources, agricultural products and of foodstuffs in Poland's exports was much higher than in its imports. Poland (the so-called Hinterland) supplied Germany with many non-processed products, and this pattern of the division of labour even strengthened in the course. The terms of trade were evident within this context. The structure of trade dependence was evident, too.

Table 3 — Commodity Pattern of Trade between Poland and Germany in 1923-1938 (share of products' groups in total imports or exports in %, current prices)

Years	Poland's Imports				Poland's Exports			
	Live animals	Food and beverages	Raw resources and semi-finished products	Finished industrial products	Live animals	Food and beverages	Raw resources and semi-finished products	Finished industrial products
1923	0.0	2.4	32.0	65.6	0.0	1.8	75.7	22.5
1924	0.1	5.6	22.9	71.4	0.5	12.6	65.2	21.7
1925	0.0	17.3	26.9	51.8	2.5	23.2	61.5	12.8
1926	0.0	3.7	51.8	44.5	3.9	25.3	67.9	2.9
1927	0.1	7.4	43.8	48.7	3.1	17.1	77.7	2.1
1928	0.1	10.2	34.9	49.8	2.5	18.9	76.2	2.4
1929	0.4	5.6	43.3	50.7	3.6	22.6	71.1	2.7
1930	0.1	6.4	45.7	47.8	4.4	23.2	68.9	3.5
1931	0.1	7.9	43.0	49.0	6.8	31.4	55.9	5.9
1932	0.0	5.8	42.8	51.4	7.3	26.8	56.7	9.2
1933	0.0	6.1	38.5	55.4	6.2	24.2	64.9	4.7
1934	0.2	1.1	32.2	66.5	3.5	15.8	70.8	9.9
1935	0.1	1.1	27.9	70.9	2.0	35.4	50.3	12.3
1936	0.0	1.1	18.9	80.0	11.7	24.9	52.3	11.1
1937	0.0	1.4	12.8	85.8	11.5	30.7	51.8	6.0
1938	0.0	0.7	10.8	88.5	14.8	29.9	46.6	8.7

Source: As in table 2.

The exchange of similar goods (additionally of their parts) is defined today as intra-industry trade [Grubel, Lloyd, 1975; Giersch, 1978]. Intra-industry specialization (division of labour) was obviously a part of trade between Poland and Germany in the interwar period. Assuming the lack of the appropriate data and research, but first and foremost the today's theoretical underpinnings, we would like to argue that the intensity of this kind of trade between Poland and Germany was in these years rather very limited. Firstly, intra-industry trade is likely to prevail between and among countries with similar factor endowments and similar per capita incomes and taxes, and it was clearly not the case in relations between Poland and Germany in the interwar period. Secondly, as mentioned earlier, just due to the different levels of development and different factors' endowment (and their intensities in produc-

tion processes), the pattern of division of labour between Poland and Germany was basically complementary in this period. And thirdly, to the best knowledge from the respective literature, the broad understood, promoting base of the substitutional division of labour between Poland and Germany was very scarce at that time. With some exceptions (e.g. traditional economic connections between enterprises from the Upper Silesia divided in 1992, or between the enterprises from this region and the enterprises from the so-called Ruhr economic centre), the specialization and cooperation agreements between Polish and German enterprises have been clearly underdeveloped and the obvious reluctance to support the conclusions of such agreements by the governments has been observed through many years. Additionally, once again with some exceptions, the scientific and technological cooperation between Polish and German enterprises was at the very early stage of development (limited exchange of specialists and students, of licences, patents etc.). Moreover, as Popkiewicz and Ryszka [1969] argue, entrepreneurs from Germany were not interested after 1921 to invest in the Upper Silesia, even in the part belonging to this country. According to Popkiewicz and Ryszka, the technical level of the whole Upper Silesia was in 1928 substantially degenerated comparing to the situation in 1924. The results were as they were. They can still be observed.

II. Trade Relations between Poland and Germany in 1989-1991

History of economic relations between Poland and the two German states until the end of 1989 was rich and a lot of books and articles are devoted to them.² However, only some facts and tendencies seem to be important with regard to the aims of the presented analysis. The most worthwhile to mention at the moment are the following:

- a) decreasing trade interdependence between Poland and the former German Democratic Republic vis-à-vis clearly increasing trade interdependence between Poland and the Federal Republic of Germany in the period 1950-1989;
- b) creation of German Economic, Monetary and Social Union (GEMSU) on July 1, 1990, and accession of the former GDR to the Federal Republic of Germany on October 3, 1990; and
- c) initiation in Poland of profound political, economic and social transformations at the end of 1989, with decisive package of measures in the sphere of economy introduced on January 1, 1990.

² See i.a.: Bolz [1988]; Czubinski [1988]; Heiduk et al. [1991]; Koszek [1986]; Lambrecht, Machowski [1991]; Martowski, Wieczorkiewicz [1986]; Misala [1979]; Skibinski [1974]; Tomala [1973]; Weiss [1983].

1. Intensity and Importance

Until the GEMSU and political unification of the two German states, they played an important role in the Poland's foreign trade. However, while the share of the former GDR declined almost systematically, the share of the Federal Republic of Germany increased considerably.

Table 4 — Share of the Former GDR and of the Federal Republic of Germany in Poland's Foreign Trade in Selected Years of 1950-1989 (% , current prices)

Specification	1950	1960	1970	1980	1985	1986	1987	1988	1989
Former GDR									
Poland's imports	11.5	12.5	11.1	5.9	6.1	5.9	5.5	5.0	4.5
Poland's exports	13.9	9.4	9.3	5.8	5.0	4.9	4.3	4.4	4.2
FRG ^a									
Poland's imports	2.6	4.8	4.1	7.4	9.1	9.9	11.7	13.3	16.1
Poland's exports	2.4	5.7	5.8	10.3	9.3	10.1	11.5	13.0	15.0

^a With Berlin West.

Source: GUS [1991 and earlier issues].

Due to many economic and non-economic reasons, the share of Poland in the total turnover of the former GDR decreased during 1950-1989 considerably, too. Contrary to this, the share of Poland in the total turnover of the Federal Republic of Germany was relatively stable and fluctuated between 0.5-0.8 %.

Table 5 — Share of Poland in the Total Foreign Trade of the Former GDR and of the Federal Republic of Germany in Selected Years of 1950-1989 (% , current prices)

Specification	1950	1960	1970	1980	1985	1988	1989
Former GDR							
Imports	9.7	6.5	6.1	5.9	5.3	4.3	4.4
Exports	14.3	8.5	8.7	7.0	5.6	4.6	4.5
FRG							
Imports	0.7	0.8	0.6	0.7	0.7	0.7	0.7
Exports	0.8	0.6	0.6	0.8	0.5	0.5	0.7

Source: As in table 4.

Profound political, economic and social changes in Germany, Poland and other Eastern and Central European countries (including the collapse of the trade system of the former Council for Mutual Economic Assistance) led i.a. to the substantial change in trade interdependence between Poland and Germany. A unified Germany began to be in 1990 the most important trading partner of Poland despite the fact that the accession of the former GDR to the Federal Republic of Germany resulted immediately in the disastrous collapse of many economic links between Polish enterprises and enterprises of the new Bundesländern [Misala, Pac, Kalinowska, 1991; Misala, 1992a].

Table 6 — Share of Unified Germany in the Poland's Foreign Trade in 1990 and 1991 (% , current prices)

Year	Poland's imports			Poland's exports		
	East Germany	West Germany	Germany	East Germany	West Germany	Germany
1990	4.1 ^a	13.1 ^a	17.2	3.4 ^a	20.5 ^a	23.9
1991	3.1	23.4	26.5	3.1	26.3	29.4

^a Own estimates.

Source: GUS [1991]; Informacje [1992]; Außenhandel [1991].

Trade relations and trade interdependence between Poland and Germany are roughly similar to those registered in the 1920's. Roughly in the sense, that while Poland's trade dependence upon Germany at the beginning of the 1990's was quite similar to that from the second decade of the 20th century, Germany's trade dependence upon Poland was in 1990 and 1991 much lower than over 60 years ago. Poland's share in total imports of Germany amounted in 1991 only 1.12 %, while its share in total exports of this country 1.27 %. Poland ranked in this year on place 18 in Germany's global imports and on place 13 in Germany's total exports. Generally, great quantitative assymetry in trade dependence exists still between Poland and Germany.

Table 7 — Foreign Trade/GDP Ratios and Share of Employed in Export Sector in Total Employment of Poland in 1990 and 1991 (% , current prices)

Specification	Total trade		Trade with Germany	
	1990	1991	1990	1991
Imports/GDP	14.9	19.6	2.6	5.2
Exports/GDP	22.4	18.8	5.8	5.5
Share of employed in exports' sector in total employment	22.5	18.9	5.8	5.5

Source: Informacje [1992]; Maly Rocznik [1992]; own calculations.

Quantitative assymetry appeared also taking into account the global economic interdependence. While foreign trade with a unified Germany amounted at the beginning of the 1990's to over 5 % of Poland's Gross Domestic Product, the share of trade with Poland in total German GDP was about 0.2-0.3 %. The proportions were similar with regard to employment effects of the development of mutual trade between these countries.

Many factors contribute to the fact that trade and other forms of economic relations with Germany are of crucial importance for Poland. Omitting the well-known real effects of their development (e.g. employment and efficiency effects, influence on the value and structure of GDP, as well as on the volume and structure of global demand and supply in the country), the following aspects seem to be the most important from the Polish point of view; economic and technological potential of Germany,

geographical proximity and connected with it costs advantages in transport, long traditions of co-operation with Germany, as well as its role and importance in various international institutions and organisations and among them in the European Communities (EC) which Poland wishes to join in the future. Moreover, the conviction that "Poland's way to the EC leads through Germany" is increasingly popular among Polish citizens. No wonder, taking into account evident realities like e.g. Germany's role in Poland's trade with the EC member countries. Just to show the problem, Germany absorbed in 1991 about 53.0 % of the total Poland's exports to these countries, while its share in total Poland's imports from them amounted to 53.2 %. In 1990 the respective shares were 47.3 % and 53.8 % [Misala, 1992b].

One of the important reasons for the growing intensity of trade relations, as well as for the growing Poland's trade dependence upon Germany is the speedy development of the private sector's external transactions. It is typical not only for turnover with Germany. The Polish private sector (defined up-to-now in the country rather conventionally and comprising in the case of foreign trade the activities of private persons, of private companies of commercial law, of joint ventures with foreign capital and their representatives, as well of foundations) is engaged more and more in foreign dealings with other countries, too. Simultaneously, however, the involvement of the so-called public sector (understood up-to-now as the former state-owned foreign trade enterprises, being nota bene also privatised) is still of great importance, especially in Poland's imports.

Table 8 — Structure of the Polish Foreign Trade by Sectors Divided According to Property Rights in Poland in 1990 and 1991 (% , current prices)

Specification	Public Sector		Private Sector	
	1990	1991	1990	1991
Poland's total foreign trade				
Imports	85.6	50.1	14.4	49.9
Exports	95.1	78.1	4.9	11.9
Poland's trade with the EC member countries				
Imports	82.1	38.0	17.9	62.0
Exports	94.2	72.2	5.8	27.8
Poland's trade with Germany				
Imports	81.9	32.8	18.1	67.2
Exports	85.0	74.4	15.0	25.6

Source: GUS [1991] and Informacje Statystyczne [1992]; own calculations.

As seen from data of table 8, the response of the earlier defined Polish private sector to the new conditions in Poland was in 1990 and 1991 clearly excessive in trade relations with Germany when taking as a reference point the performance of this sector in Poland's total foreign turnover, and there is no wonder that this has happened. All the above mentioned factors stimulating the economic relations between Poland and Germany were at work. It sounds optimistically from the Polish point of view.

2. Pattern of Competitiveness

To study more deeply the pattern of competitiveness in trade relations between Poland and Germany (and not only) seems reasonable, and there are many reasons to prove it. However, this is not an easy task at the moment. Just to begin with the problems, as noted earlier elsewhere [Neven, Röller, p. 101] "a standard approach to assess comparative advantage of Poland (and other East and Central European countries, whose national economies were until 1989 the clearly "socialist" and Soviet-type ones — J.M.) would consist of estimating differences in factor prices and productivity across countries. Such an approach is unlikely to be successful for Eastern European countries for at least two reasons. First, reliable information on factor prices and productivity is hard to come by. Second, in the absence of well organised labour and capital markets in the East, recorded factor prices might not be very meaningful. An alternative approach to assessing comparative advantage would be to estimate differences in factor endowments. Such an exercise is again likely to be difficult because of a shortage of reliable data".

Having met the same problems, experts of the World Bank [1987], Konovalow [1989], and Hughes and Hare [1991] tried to apply the well-known Domestic Resource Cost (DRC) method when evaluating international competitiveness of Poland and some other East and Central European countries. The results were criticized in Poland. According to J. Kotynski [1988], this criticism stems from some oversimplifications of the discussed concept, from many shortcomings of the methodology applied (e.g. too small samples of the analysed Polish enterprises, some miscalculations), and first and foremost from many deviations of economic parameters in Poland before economic reform started in January 1990 (e.g. distorted internal prices, subsidies in foreign trade, overvalued exchange rate of the national currency). Let's add to this that the authors of the all above mentioned analyses have applied statistical data referring to the second part of the 1980's. But let's additionally mention that Hughes and Hare [1992] repeated their study applying the data from the end of the last decade and after adjusting them they came to the conclusion that market signals did not provide in 1990 and 1991 sufficiently clear guidance to the directions of changes in Poland's competitiveness. They attributed this mainly to the slow progress of the process of constructing market-type economy, involving reforms in the legal framework for conducting business, in accounting and statistics, in banking and the financial system, in the tax system and in the labour market [Hughes, Hare, 1992, p. 3].

All in all, the application of the well-known concept of the "revealed comparative advantage (RCA), originally proposed by Balassa [1976], seems to be the reasonable solution in the analysed case. It seems to be still a fair guide to the assessment of the real comparative advantage and may provide at the moment many practical insights into the realities in the rather good manner. The formula of the respective, chosen indicator is:

$$RCA^t = \ln \frac{x_i / m_i}{X / M}$$

where:

x_i — Poland's exports to Germany of "i" commodity group or products

m_i — Poland's imports from Germany of "i" commodity group or products

X — total Poland's exports to Germany

M — total Poland's imports from Germany

i — product's groups (or products) indices

t — years indices.

As usual, the negative RCA values indicate the lack of revealed comparative advantage of the reporting country (Poland in the case), while the positive ones the existence of the such understood comparative advantages. It is well-known that every RCA indicator is intended to describe only what is, and not what ought to be, or what is rational and efficient. This is a problem of itself.

The more important problem is now that one of statistical data from the Polish sources (therefore from the reporting country, what seems to be of great importance). The appropriately disaggregated data for our analysis are available at the moment, but with regard to the Poland's public sector in foreign trade only. There is no other solution as just to accept and use these data in the following considerations having in mind that:

- a) the private sector's activities in Poland's trade with Germany were almost negligible before 1990 and in this year rather very limited, especially in Poland's exports (see table 8);
- b) the general picture of the Polish private sector's activities in 1991 is known. The structure of imports of this sector was in 1991 quite similar to that of Poland's public sector, while in the same year the private persons and enterprises exported mainly natural resources'-intensive and labour-intensive products. As Dziewulski [1992, p. 7] writes, with regard to the foreign trade activities of the Poland's private sector "it distinguishes itself by specific priorities and they are products located as a rule directly on the market; products of husbandry, of meat processing, of wood industry and of metallurgy industry".

Finally there is a problem of the reference period. Logically, the analysis concerning trade relations with a politically unified Germany should refer to the years 1990 and 1991. However, we would like to extend this analysis also to the year 1989. The main reasons are the following:

- a) the share of the former GDR (nowadays of the new Länder of Germany) in the total trade of Poland was very limited in 1989; trade with the Federal Republic of Germany dominated clearly in this year (see table 4);
- b) according to results of the earlier analysis [Misala, 1992a], the increasing trade dependence of Poland upon the Federal Republic of Germany brought clearly a switch of the commodity pattern of Poland's trade relations with two German states taken together; the pattern of this trade evaluated

since many years towards the pattern typical for the economic relations with the Federal Republic of Germany (nowadays western Länder of a unified FRG), and in 1989 the influence of the trade with new Länder of Germany on the commodity pattern of Poland's turnover with the unified Germany was clearly limited, almost negligible in 1989. The trade relations with the former GDR were simply developed in many cases not in accordance with the principle of comparative advantages and as such they could not survive in the changed circumstances, when just the trade according to this principle gets — as it seems — more and more important.

Table 9 — Revealed Comparative Advantage (RCA) Indicators in Poland's Trade with Germany by Sections of the CN in 1989-1991

Sections	Specification	1989 ^a	1990	1991
I	Live animals and animal products	0.86	2.14	0.79
II	Vegetable products	-0.59	1.04	0.84
III	Animal or vegetable fats and oils and waxes	-1.56	-1.33	-2.06
IV	Prepared foodstuffs, beverages and tobacco	0.43	-0.30	-0.42
V	Mineral products	1.45	0.90	0.97
VI	Chemicals and products of allied industries	-1.70	-0.35	-0.79
VII	Plastics, rubber and related articles	-0.83	-0.61	-0.52
VIII	Raw hides and skins, leather, travel goods	0.31	0.89	0.62
IX	Wood, cork and related articles	4.67	4.17	2.44
X	Pulp of wood, paper and paperboard, scrap	0.30	0.15	-0.23
XI	Textiles and textile articles	-0.24	0.01	-0.37
XII	Footwear, headgear, umbrellas, artificial flowers	1.08	0.40	0.79
XIII	Articles of stone, plaster, cement, asbestos, etc.	0.74	0.61	-0.12
XIV	Pearls, precious stones and metals	2.56	2.01	3.31
XV	Base metals and articles of base metal	1.01	1.14	1.28
XVI	Machinery and mechanical appliances, equipment etc.	-1.42	-1.56	-1.02
XVII	Vehicles, aircraft, vessels and equipment	-1.12	-0.76	-0.11
XVIII	Optical and photographic instruments and apparatus	-1.97	-1.99	-1.67
XIX	Arms and ammunition	-1.24	-2.60	-2.55
XX	Miscellaneous manufactured articles	2.89	1.61	1.84
XXI	Works of art, collectors' pieces and antiques	0.00	0.00	0.00

^a Trade with the Federal Republic of Germany only.

Source: CIHZ [1992]; own calculations.

One can to add to these reasons the next one. There could be namely expected that the comparisons between the patterns of competitiveness of Poland's private sector's trade with Germany in 1989, 1990 and 1991 will bring some other insights with regard to the problem of short- and long-term consequences of German unification on the development of trade with Poland. That's why in the presented analysis the two German states are treated as a uniform state in 1989. Of course, very cautious interpretation of the obtained results should be and is recommended. And the last remark. Just to save space, the term Poland's trade (instead of the Poland's public sector's trade) is used in this and in the following chapter.

According to the preliminary results of analyses of the Poland's and Germany's factor endowment (and their quality) which is strongly influenced by different levels of economic development, Poland possessed a revealed comparative advantage in primary non-processed products and semi-finished industrial products (live animals and animal products, mineral products, raw hides and skins, footwear and headgear, precious stones and metals, and — first and foremost — wood and related materials) in 1989-1991. On the other side, the revealed comparative advantages of Germany appeared especially in such the relatively high processed industrial products as machinery and mechanical appliances (with the respective equipment), vehicles, aircraft, vessels and equipment, then optical and photographic instruments and apparatus, as well as chemicals and products of allied industries. Interestingly, Germany revealed also comparative advantage in animal or vegetable fats and oils, plastics and related articles, in 1989-1991, and additionally in prepared foodstuffs, beverages and tobacco in 1990 and 1991 (see also table 1 in the annex).

The general picture of the pattern of competitiveness in trade relations between Poland (more exactly Poland's public sector) and Germany do not change substantially taking into account appropriate data at the two-digit level of the CN. Respective indices are presented in table 2 of the annex.

In order to explain the pattern of the Poland's competitiveness vis-à-vis Germany it seems appropriate to catalogue the traded goods in accordance with the neo-factor hypothesis based on the Heckscher-Ohlin-Samuelson theorem, as well as on the neotechnology hypothesis. Having in mind these two hypotheses (in reality sets of them), one can divide the traded goods at the two-digit level of the CN into five groups. They are:

- a) land-intensive products;
- b) raw resources'-intensive products;
- c) capital-intensive products;
- d) labour-intensive products; and
- e) technology-intensive products.

Details concerning such a division are presented in table 3 of the annex.

Table 10 — Stability of Competitiveness' Structure in Poland's Trade with Germany at One-, and Two-Digit Levels of the CN in 1989-1991 (correlation coefficients, n=21 and 96 respectively)

Periods	At the one-digit level	At the two-digit level
1989/1990	0.90	0.70
1990/1991	0.86	0.68
1989/1991	0.90	0.72

^a Calculated according to the formula:

$$r^t = \frac{C_{xy}}{S_x \cdot S_y}$$

where:

$$C_{xy} = \frac{1}{n} \sum \sum (x_i - \bar{x}) \cdot (y_i - \bar{y})$$

x_i — value of Poland's RCA indicator in section (branch) "i" in the year "t"

\bar{x} — mean value of Poland's RCA indicators by sectors (branches) in the year "t"

y_i — value of Poland's RCA indicator in section (branch) "i" in an other year

\bar{y} — mean value of Poland's RCA indicators by sectors (branches in an other year)

i — sections' (branches') indices

t — years' indices

S_x — standard deviations of values " x_i " in the respective years

S_y — standard deviations of values " y_i " in the respective years.

Source: CIHZ [1992]; own calculations.

The evidence presented at the two-digit level of the CN corresponds with the rather common intuition with regard to Poland's and Germany's relative factor endowment. Poland revealed comparative advantage in land-intensive, raw resources-intensive, and labour-intensive products in 1989-1991, while Germany revealed comparative advantage in capital-intensive products and first and foremost in technology-intensive products. Interestingly, the revealed comparative advantage of Poland at the two-digit level of the CN was the highest in the case of land-intensive products and the lowest in the case of labour-intensive products. It seems worthwhile to add at this moment that due to many reasons, the agricultural production in Poland — especially in the clearly dominating private sector — is still a labour-intensive one.

Table 11 — Structure and RCA-Indices in Poland's Trade with Germany by Factor Intensities at the Two-Digit Level of the CN in 1989-1991 (% , current prices)

Specification	Structure of trade in %						RCA-Indices		
	Poland's imports			Poland's exports					
	1989 ^a	1990	1991	1989 ^a	1990	1991	1989 ^a	1990	1991
Land-intensive products	13.7	2.1	4.6	15.9	15.5	12.1	0.38	2.01	0.97
Raw resources'-intensive products	30.2	31.4	32.5	56.6	60.9	57.7	0.63	0.66	0.57
Capital-intensive products	13.1	10.6	16.0	3.8	3.8	5.9	-1.25	-1.02	-0.99
Labour-intensive products	5.7	5.4	7.0	11.2	9.5	10.5	0.68	0.57	0.41
Technology-intensive products	37.4	50.5	39.9	8.5	10.3	13.7	-1.48	-1.59	-1.07
Total	100.0	100.0	100.0	100.0	100.0	100.0	x	x	x

^a Trade with the Federal Republic of Germany only.

Source: CIHZ [1992]; own calculations.

The most critical shortcomings of many analyses regarding structure of competitiveness according to factor intensities are their concentration on manufacturing sector only or mostly, and the rather high aggregation level of statistical data used. Just to avoid respective criticism, an attempt is made here to deepen the analysis using categories of traded goods proposed by Hufbauer [1970], Sautter [1983] and Leamer [1984], and valuably reviewed and systematized by Mange [1990]. Unfortunately, Mange [1990] operates in his book with the data prepared according to the Standard International Trade Classification (SITC) Revisited II. However, there are possibilities to transform this classification into the CN with help of the "key" applied in the United Nations' Statistical Papers [1975], and this has been done.³ As a consequence, we can operate with five main groups of products according to factor intensities at the four-digit level of the CN, namely with:

- land-intensive products of vegetable and animal origin;
- forest-intensive products;
- raw resources'-intensive products;
- labour-intensive products and
- technology-intensive products.

The further division of products specified under a, b, d and e is possible and useful. The land-intensive products comprise products of vegetable origin (not processed and processed), products of animal origin (not processed and processed) and products not specified by factor intensity. Also forest-intensive products can be divided into not processed and processed ones. Finally, we can sort out labour-intensive products into skilled labour-intensive ones and unskilled labour-intensive ones,

³ Respective transformation of SITC Revisited 2 into the CN has been made during the author's staying in the Kiel Institute of World Economics. Interested readers can obtain the "key" from Institute for International Economic Relations, Warsaw School of Economics, Al. Niepodleglosci 162, 02-554 Warsaw, Poland.

while technology advanced products can be sort out into technology-intensive easy to imitate ones and technology-intensive difficult to imitate ones.

Table 12 — RCA Indices in Poland's Trade with Germany by Factor Intensities at the Four-Digit Level of the CN in 1989-1991

Specification	1989 ^a	1990	1991
Land-intensive products	-0.24	0.28	-0.79
Forest-intensive products	1.84	1.89	1.76
Natural resources'-intensive products	0.46	0.86	1.38
Labour-intensive products	-0.49	-0.41	-0.09
Capital-intensive products	0.95	0.91	0.43
Technology-intensive products	-1.69	-1.79	-1.41
Land-intensive products			
both of vegetable and animal origin	-4.82	-5.69	-1.99
of vegetable origin (not processed)	-0.73	0.81	-0.23
of vegetable origin (processed)	0.04	-0.49	-1.02
of animal origin (not processed)	0.18	1.38	-1.10
of animal origin (processed)	0.64	1.47	0.81
Forest-intensive products			
not processed	3.65	4.33	2.78
processed	1.62	1.69	1.58
Natural resources'-intensive products	0.46	0.86	1.38
Labour-intensive products			
skilled labour-intensive products	-1.31	-1.03	-0.65
unskilled labour-intensive products	0.62	0.61	0.83
Capital-intensive products	0.95	0.91	0.43
Technology-intensive products			
easy to imitate	-1.58	-1.66	-1.35
difficult to imitate	-2.63	-2.80	-2.02

^a Trade with the Federal Republic of Germany only.

Source: CIHZ [1992]; own calculations.

According to the analysis based on the very disaggregated data on trade between Poland and Germany, Poland revealed significant comparative advantage in forest-intensive products (particularly in not processed ones), in natural resources'-intensive products and in capital-intensive products in 1989-1991, while Germany comparative advantage in technology-intensive products (especially in the difficult to imitate ones) and — surprisingly to some extent — in labour-intensive products. The latter case is additionally interesting in the sense that the lack of Poland's comparative advantage in skilled labour-intensive products was accompanied by revealed comparative advantage in unskilled labour-intensive ones.

Poland's competitiveness in trade with Germany in land-intensive products was unstable in 1989-1990. One can argue, however, that on the whole the reactions expected from the conventional theory were at work. In 1989, Poland was generally not competitive but it was mainly due to the revealed comparative disadvantage in trade in cereals and products of the milling industry (see table 2

in the annex). With regard to these products, the opposite statement was true in 1990 when — additionally — Poland's advantage in land-intensive products of animal origin (processed and non-processed) increased substantially. It was mainly due to the consequences of the restrictive monetary, fiscal and income policies in the country, as well as due to the underdevalued national currency (sharp reduction of real aggregate demand, of consumption and of imports, reduction of the stocks, increased exports of the agricultural products, including the stocks). The situation was quite different (once again) in 1991 even though the internal demand barrier was still at work and the harvests were not worse than one year earlier. On the one hand, the overshooting of the deep devaluation on zloty disappeared due to inflation, and on the other, the domestic stocks of agricultural products stabilized on a rather low level.

According to the assumptions based on the theory, Poland's comparative disadvantage in technology-intensive products declined substantially, even in the case of the ones difficult to imitate. But contrary to the developments in Poland's trade with the all EC member countries and contrary to the reasonable expectations specified elsewhere [Misala, 1992b], the revealed comparative of Poland vis-à-vis Germany increased substantially in the case of natural resources'-intensive products. It was a case of its own.

Table 13 — List of the Most Competitive Polish Products in Poland's Trade Relations with Germany in 1989-1991

CN Code	Specification	RCA-Indicators		
		1989 ^a	1990	1991
0207	Meat and edible offal of the poultry	4.10	7.53	3.35
0208	Meat and edible meat offal	.	5.00	5.13
0301	Live fish	2.00	1.87	3.77
0302	Fish, fresh or chilled	.	3.50	5.19
0304	Fish fillets and other fish meat	.	4.57	2.96
0511	Animal products n.e.s.	1.87	2.03	6.45
0602	Other live plants and their roots	3.41	3.59	4.52
1205	Rape seeds	8.77	6.16	5.71
1602	Prepared or preserved meat other than sausages	3.16	3.55	6.39
2009	Fruit and vegetable juices	3.54	1.90	4.13
2836	Carborates	1.07	5.78	5.14
2849	Carbides	2.32	1.69	2.15
2926	Nitrile-function compounds	1.62	3.04	5.94
3102	Mineral and chemical fertilizers	2.68	3.79	3.84
3501	Casein and caseinates	.	6.01	5.02
4001	Natural rubber and other natural gums	0.90	2.65	2.17
4008	Plates, sheets and strip of vulcanized rubber	1.45	0.71	3.67
4202	Trunks, vanity, suit etc. from leather and plastics	.	1.85	3.21
4203	Articles of apparel and clothing accessories of leather	3.82	2.29	2.80
4407	Wood sawn or chipped lengthwise	6.87	4.07	5.59
4411	Fibreboard of wood or other ligneous materials	.	2.77	3.46
4412	Plywood, veneered panels	.	4.44	3.35

Table 13 continued

CN Code	Specification	RCA-Indicators		
		1989 ^a	1990	1991
4415	Packing cases, boxes and crates	.	7.29	6.25
4418	Builders' joinery and carpentry of wood	8.67	2.78	3.41
4419	Tableware and kitchenware of wood	8.93	.	2.33
4601	Plaits and similar products of plaiting materials	.	8.81	6.29
5112	Woven fabrics of combed wool	5.03	3.40	7.55
5705	Not tufted carpets and other floor coverings	1.43	0.56	3.02
6107	Men's or boys' underpants, briefs, pyjamas etc.	0.50	4.81	5.23
6302	Bed-linen, table-linen, toilet-linen	9.45	6.27	8.07
6403	Footwear with outer soles of rubber	1.64	1.74	2.18
7007	Safety glass	2.53	1.60	4.39
7106	Silver and silver-plated semi manufactures	6.74	5.91	6.74
7207	Semi-finished products of iron and non-alloy steel	3.37	5.05	10.15
7301	Ship poling of iron and steel	6.17	2.86	3.26
7302	Railway or tramway truck construction of iron	2.05	0.72	2.23
7303	Tubes, pipes and hollow profiles of cast iron	3.57	4.94	2.72
7309	Reservoirs, tanks containers	1.37	2.32	2.99
7317	Nails, tacks and drawing pins	4.26	3.46	4.44
7318	Screws, bolts, nuts and cotter pins	1.10	0.71	2.28
7323	Household articles of iron and steel	1.95	1.59	3.11
7326	Other articles of iron and steel	1.95	1.59	3.11
7403	Refined copper and copper alloys, unwrought	5.31	9.46	9.00
7407	Copper bars, rods and profiles	5.50	6.36	5.67
7409	Copper plates and sheets	0.50	0.80	2.97
7413	Stranded wires, cables and bands of copper	4.46	5.45	3.26
8201	Hand tools	4.69	3.08	2.71
8215	Spoons, forks, ladles, skimmers, cake-servers etc.	5.87	5.72	2.45
8411	Turbo jets and turbo-propellers	.	3.58	3.53
8501	Electric motors and generators	1.67	0.77	2.33
8509	Electro-mechanical domestic appliances	2.48	0.70	2.27
8511	Electrical ignition and starting equipment	.	2.36	4.98
8544	Insulated wire, cable and conductors	1.95	2.01	2.48
9403	Other furniture than seats	4.26	4.66	4.33
9405	Lamps and lighting fittings	1.72	1.29	5.01
9603	Brooms and brushes	0.86	0.37	2.09

^a Trade with the Federal Republic of Germany only.

Source: CIHZ [1992]; own calculations.

Capital-intensive products dominate still in Poland's exports to Germany (see table 5 in the annex). In connection with it, these products can be also found on the list of the most competitive ones (e.g. fertilizers, products of iron and steel). But this list entails additionally a lot of natural resources-intensive products and forest-intensive ones with the clearly increasing RCA indicators (e.g. various articles of iron and steel, unwrought copper and copper alloys, silver and silver-plated semi manufactures, some products of wood). Last but not least, there are also many labour-intensive products, especially unskilled labour-intensive ones (e.g. clothing, textiles, footwear). This is mainly due to the so-called job processing agreements between enterprises from Poland (e.g. of the

well-known suits producer in Bytom) and from Germany. Langhammer [1992b, p. 12] is arguing with regard to this and in a broader context as follows "passive Lohnveredelung (passive job processing - my remark, J.M) ist einerseits eine typische Frühstufe intraindustrieller Verflechtung zwischen Anbietern aus Ländern mit unterschiedlicher Ressourcenausstattung, andererseits ein politischer Kompromiß zwischen den gegenläufigen Interessen von Konsumentenprotektion in den Industrieländern. Sie bietet Optionen zur Verlagerung arbeitsintensiver Verarbeitungsstufen, wenn die Rahmen für Lizenzproduktionen, joint ventures oder Direktinvestitionen mit Mehrheitsbeteiligung in potentiellen Kapitalempfängerländern noch nicht gegeben sind. Im konkreten Fall trägt passive Lohnveredelung dazu bei, osteuropäische Anbieter im Frühstadium des Transformationsprozesses mit EG-Unternehmen zu vernetzen und sie an die auf dem Weltmarkt üblichen Preis-, Qualitäts- und Terminstandards heranzuführen. Darüber hinaus sichert sie den osteuropäischen Produzenten Partner innerhalb der Gemeinschaft, die sich mit ihnen gegen handelspolitische Barrieren zur Wehr setzen". These conclusions lead straightforward to the next part of the study.

3. Intra-Industry Specialization

Despite the fact that a connection between intensity and structure of intra-industry trade and growth of economic relations between Poland and Germany has been established on a number of occasions [e.g. Bolz, Pissulla, 1981; Misala, 1992a; Weiss, 1983], little by way of systematic analysis of the links between the two exists. Moreover, the problems of this kind of trade in Poland's economic relations with Germany seem to be clearly underdeveloped. To meet partially these problems, both very important and connected, indicators of the intensity of intra-industry trade between Poland (more precisely - between Poland's public sector in foreign trade) and Germany were calculated. The following formula was used:

$$IIT_i^t = \frac{(x_i + m_i) - |x_i - m_i|}{(x_i + m_i)}$$

where:

x_i — Poland's exports to Germany in section (branch) "i"

m_i — Poland's imports from Germany in section (branch) "i"

i — sections's (branche's) indices according to the one-digit level and two-digit level of the CN

t — years indices.

As well-known, indicators calculated in accordance with the above mentioned formula range from 0 to 1. Level 0 of the indicator means the total lack of intra-industry trade, and level 1 the development of such a trade only (completely perfect intra-industry division of labour at the applied level of the statistical data aggregation). The results of the calculations regarding the turnover between Poland and Germany in 1989-1991 at the one-digit level of the CN are presented in the next table. Table 3 in the

annex entails IIT indicators in economic relations between Poland and Germany in 1989-1991 at the two-digit level of the CN.

Table 14 — IIT-Indicators in Poland's Trade with Germany at the One-Digit Level of the CN in 1989-1991

Sections	Specification	1989 ^a	1990	1991
I	Live animals and animal products	0.64	0.12	0.36
II	Vegetable products	0.66	0.32	0.34
III	Animal or vegetable fats and oils and waxes	0.32	0.65	0.42
IV	Prepared foodstuffs, beverages and tobacco	0.84	0.85	0.84
V	Mineral products	0.42	0.37	0.31
VI	Chemicals and products of allied industries	0.61	0.88	0.97
VII	Plastics, rubber and related articles	0.56	0.99	0.90
VIII	Raw hides and skins	0.90	0.37	0.41
IX	Wood, cork and related articles	0.02	0.02	0.08
X	Pulp of wood, paper and paperboard, scrap etc.	0.91	0.64	0.75
XI	Textiles and textile articles	0.83	0.71	0.82
XII	Footwear, headgear, umbrellas, artificial flowers etc.	0.56	0.54	0.36
XIII	Articles of stone, plaster, cement, asbestos etc.	0.70	0.46	0.70
XIV	Pearls, precious stones and metals	0.16	0.14	0.03
XV	Base metals and articles of base metal	0.58	0.30	0.24
XVI	Machinery and mechanical appliances, equipment etc.	0.35	0.55	0.86
XVII	Vehicles, aircraft, vessels and equipment	0.45	0.92	0.70
XVIII	Optical and photographic instruments and apparatus	0.22	0.40	0.56
XIX	Arms and ammunition	0.41	0.24	0.28
XX	Miscellaneous manufactured articles	0.12	0.20	0.14
XXI	Works of art, collectors' pieces and antiques	0.00	0.00	0.18
	Non-weighted mean	0.49	0.46	0.49
	Standard deviation	0.28	0.30	0.29
	Weighted mean	0.26	0.20	0.23

^a Trade with the Federal Republic of Germany only.

Source: CIHZ [1992]; own calculations.

According to the results of analysis concerning structure of competitiveness, a low intensity of intra-industry trade between Poland and Germany in 1989-1991 could be expected. Quite simply, the real base for development of the intra-industry division of labour between these countries is limited (e.g. high standard deviations of intra-industry trade indices). Another indication and general reason of the low intensity of intra-industry division of labour between Poland and Germany is the limited number of traded goods. This is easy to prove when studying the 4-digit positions of the CN: many of the products were not traded at all between Poland and Germany in the analysed years, while on the other hand, a lot of products imported to Poland didn't appear simultaneously among its exports.

Almost 30 % of products specified in the CN at the 4-digit level were not imported from Germany in 1989-1991, while in the Poland's exports to this country the respective share was on the average about 50 %. Moreover, the specific phenomenon of "appearances" and "disappearances" of many goods

from year to year was observed. E.g., in 1991, in Poland's imports from Germany such products as medicaments, colour lakes, mixed alkylbenzene, petroleum resins, transmission belts, iron and non-alloy steel in ingots, bars and rods, stranded wire and cables of aluminium or weaving machines which were imported in 1990 disappeared in the statistics. Despite of this, the structure of the intra-division of labour between Poland and Germany was relatively stable and therefore is also predictable.

Table 15 — Number and Relative Importance of Products Traded and Non-Traded between Poland and Germany in 1989-1991 at the 4-Digit Level of the CN

Specification	Total			%		
	1989	1990	1991	1989	1990	1991
Four-digit positions of the CN	1160	1160	1160	100.0	100.0	100.0
Products traded between Poland and Germany						
Poland's imports	846	898	781	72.9	77.4	67.3
Poland's exports	571	625	623	49.2	53.8	53.7
Products not traded between Poland and Germany						
Poland's imports	314	262	379	27.1	25.6	32.7
Poland's exports	590	536	538	50.8	46.2	46.8

Source: CIHZ [1992]; own calculations.

Table 16 — Stability of Intra-Industry Trade's Structure in Poland's Turnover with Germany^a at One-, and Two-Digit Levels of the CN in 1989-1991 (correlation coefficients, n=21 and 96 respectively)^b

Periods	At the one-digit level	At the two-digit level
1989/1990	0.53	0.55
1989/1991	0.58	0.47
1990/1991	0.87	0.65

^a In 1989 trade with the Federal Republic of Germany only. — ^b Calculated according to the formula presented in table 10.

Source: CIHZ [1992]; own calculations.

The empirical evidence on intra-industry division of labour between Poland and Germany leads to the conclusion that the same general determinants operate in this trade as in trade among western countries. Relatively low intensity of intra-industry turnover between Poland and Germany is to attribute first and foremost to the different factor endowment and to the differences in the level of economic development measured by the per capita income. The structure of the intra-industry division of labour between these countries seems to support this view.

Table 17 — IIT Indicators in Poland's Turnover with Germany in Products' Groups Selected by Factor Intensities at the Four-Digit Level

Specification	1989 ^a	1990	1991
Land-intensive products	0.83	0.58	0.98
Forest-intensive products	0.30	0.15	0.15
Natural resources'-intensive products	0.82	0.37	0.21
Labour-intensive products	0.71	0.90	0.68
Capital-intensive products	0.60	0.36	0.47
Technology-intensive products	0.29	0.46	0.68
Land-intensive products			
both of vegetable and animal origin	0.01	0.01	0.45
of vegetable origin (not processed)	0.61	0.39	0.75
of vegetable origin (processed)	0.97	0.94	0.86
of animal origin (not processed)	0.96	0.24	0.82
of animal origin (processed)	0.74	0.22	0.35
Forest-intensive products			
not processed	0.06	0.01	0.06
processed	0.36	0.18	0.18
Natural resources'-intensive products	0.82	0.37	0.21
Labour-intensive products			
skilled labour-intensive products	0.39	0.79	0.95
unskilled labour-intensive products	0.74	0.45	0.34
Capital-intensive products	0.60	0.36	0.47
Technology-intensive products			
easy to imitate	0.32	0.52	0.71
difficult to imitate	0.12	0.20	0.44

^a Trade with the Federal Republic of Germany only.

Source: CIHZ [1992]; own calculations.

According to the expectations derived from the intra-industry trade theory, intensity of this kind of division of labour between Poland and Germany was the highest in the case of products with relatively low value added (e.g. land-intensive products, unskilled labour-intensive products), the forest-intensive products being the clear exception. It is not surprising taking i.a. into account the earlier mentioned role and importance of the so-called job-processing in the total turnover between Poland, Germany and some other EC member countries. Data in table 18 seem to prove these facts.

The general picture of the Polish-German intra-industry division of labour during 1989-1991 reflect to a great extent differences in the factors abundance and differences in the level of economic development of Poland and Germany. Nevertheless, some changes were observed, too. The intensity of intra-industry trade increased i.a. in skilled labour-intensive products, as well as in technology-intensive products, both easy to imitate and difficult to imitate ones. The opposite was true for the intra-industry specialization in natural resources'-intensive products and capital-intensive products. These changes resulted from many factors which — as it seems — will also influence Polish-German trade in the future.

Table 18 — Products Recording the Highest IIT-Indicators in Turnover between Poland and Germany in 1989-1991 at the Four-Digit Level of the CN

CN Code	Specification	1989 ^a	1990	1991
1515	Fixed vegetable fats and oils	0.55	0.74	0.75
1519	Industrial monocarboxylic fatty acids	0.57	0.66	0.73
2811	Inorganic acids and oxygen compounds	0.56	0.61	0.90
2818	Aluminium oxide and hydroxide	0.76	0.68	0.86
2825	Hydrazine and hydraxylamine	0.20	0.43	0.86
2826	Fluorides, flourosilicates	0.39	0.40	0.87
2833	Sulphates, alums	0.95	0.70	0.71
2902	Cyclic hydrocarbons	0.87	0.77	0.73
2903	Halogenated derivatives of hydrocarbons	0.75	0.56	0.81
2914	Ketones and quinones	0.81	0.97	0.79
2918	Carboxylic acids	0.37	0.26	0.74
2924	Carboxyamide-function compounds	0.55	0.55	0.91
2941	Antibiotics	0.29	0.61	0.78
3908	Polyamides in primary form	0.42	0.68	0.91
3920	Plates, sheets, film, foil and strip of plastics	0.60	0.82	0.91
3924	Tableware and kitchenware of plastics	0.81	0.35	0.83
4802	Uncoated paper and paperboard	0.22	0.38	0.87
5504	Artificial staple fibres	0.46	0.47	0.70
6102	Women's or girls' overcoats	0.13	0.99	0.71
6103	Men's or boys' suits and jackets	0.47	0.25	0.85
6104	Women's or girls' suits and jackets	0.81	0.41	0.70
6108	Women's or girls' slips and petticoats	0.23	0.69	0.89
6201	Men's or boys' overcoats	0.82	0.65	0.85
6202	Women's or girls' overcoats	0.14	0.33	0.82
6203	Men's or boys' ensembles	0.26	0.84	0.81
6205	Men's or boys' shirts	0.97	0.20	0.70
6206	Women's or girls' blouses and shirts	0.48	0.82	0.71
6308	Sets consisting of woven fabric and yarn	0.63	0.10	0.90
6402	Footwear without outer soles	0.70	0.28	0.89
6805	Natural and artificial abrasive powder	0.48	0.87	0.74
6902	Refractory bricks, blocks and tiles	0.73	0.57	0.80
7210	Flat-rolled products of iron	0.87	0.42	0.99
7217	Wire of iron or non-alloy steel	0.86	0.77	0.54
7307	Tube and pipe fittings	0.65	0.19	0.89
7311	Containers for compressed or liquefied gas	0.89	0.87	0.77
7312	Stranded wire, ropes and cables of iron and steel	0.56	0.66	0.87
7321	Stoves, ranges, grates and cookers	0.52	0.81	0.98
8207	Interchangeable tools for hand tools	0.85	1.00	0.79
8208	Knives and cutting blades	0.84	0.62	0.75
8402	Steam or other generating boilers	0.49	0.49	0.56
8409	Parts suitable for piston engines	0.89	0.64	0.95
8421	Centrifuges, including centrifugal dryers	0.84	0.90	0.93
9008	Image projectors	0.72	0.70	0.90
9026	Instruments for measuring or checking the flow	0.55	0.82	0.72
9031	Other measuring or checking instruments	0.63	0.87	0.73

^a Trade with the Federal Republic of Germany only.

Source: CIHZ [1992]; own calculations.

III. Conclusions and Prospects

Contemporary Poland and Germany are now different countries than they were in the interwar period. However, their mutual trade still exhibits some characteristics which were observed sixty or seventy years earlier. The most important of them are the following:

- a) Germany is by far the most important trade partner of Poland while Poland is only marginal trade partner of Germany and thus trade interdependence between Poland and Germany is clearly an asymmetrical one; trade dependence of Poland upon Germany is several times higher than Germany's trade dependence upon Poland;
- b) quantitative asymmetry in Polish-German trade relations is accompanied by a qualitative one; Poland depends especially heavily upon Germany in technology- and skilled labour-intensive products, while imports of Germany are concentrated on capital-, natural resources'- and land-intensive products;
- d) intra-industry division of labour between Poland and Germany is clearly underdeveloped.

Summarizing, the Polish-German trade at the turn of the 1980's and 1990's is quite similar to that in the 1920's and 1930's. Quantitative asymmetry is almost the same. The asymmetry of a qualitative type is similar, too, although the respective distances are observed on the quite different level of the economic development of these countries, within new economic structures etc. Moreover, some new factors are valid. There are challenges but also chances and it seems reasonable to grasp the latter as a starting point.

Economic and technological gaps between Poland and Germany are visible at the first glance. However, there are possibilities to catch up and the problem is — from the Poland's point of view — just to start this process or — more precisely — to create the appropriate conditions. According to B. Heitger [1990], the fully successful catching up of Poland and other East and Central European countries is rather possible until 2000 but this requires i.a. (omitting substantial inflows of foreign capital and technology) enormous internal saving and investment efforts. He argues that these countries are in a position to catch up in several years provided that investments grow by 3.8 % yearly and the share of investments in the Gross Domestic Product amounts about 26.5 %. However, the realities in Poland are up-to-now dramatically different (e.g. recessionary tendencies in 1990-1991 of about 10 % of GDP yearly) and therefore there is still to take into account differences in the level of economic development between Poland and Germany until — let's say — 2010 or 2020. The consequences for the intensity and the pattern of Polish-German division of labour are rather clear. There can be expected in the future the existence of a quantitative trade asymmetry between Poland and Germany. But this asymmetry can be probably narrowed even providing the more or less pronounced differences in the levels of GDP per capita of both countries.

Some western scholars have prepared in recent years valuable analyses of the potential intensity of East-West European trade based on the so-called gravity models, and their conclusions are quite obvious; foreign trade of Poland and other Central and East European countries was repressed by the socialist planning and integration and there is a potential to change the situation [Bergeijk, Oldersma, 1990; Havrylyshyn, Pritchett, 1991; Döhrn, Milton, 1992]. I would like to argue the same with regard to the intensity of the Polish-German trade in the future. Anyway, if the situation from the 1920's and 1930's reappears once again, there will be possibilities to increase the Poland's share in the Germany's total foreign trade at least about 0.4-0.5 percentage point and it seems to be a lot. Collins and Rodrik [1991] argue that Germany's share in the Poland's foreign turnover can reach in 2000 about 22-23 % and it seems reasonable. Shall we learn from the history and shall we be realistic, there is to take into account that the Poland's share in the total German foreign trade can be about 2.0-2.5 % in this year. There are many factors in favour of this assumption.

Poland gravitates economically towards Germany and this situation can be even strengthened in the future. The most important factors promoting this process on the Poland's demand side seem to be the following:

- a) traditions of economic cooperation, some experience and existing relations with German market, as well as with German firms (e.g. knowledge of the language, appreciation of keeping terms of contracts by Germans);
- b) geographical proximity and therefore the specific cost advantages in transportation and communication;
- c) continuation of transformation process in Poland and expected take-off of Poland's economy in the next years what can lead i.a. to the growth of imports' demand;
- d) relatively high internal demand elasticities on products imported from Germany;
- e) gradual liberalization of Polish imports from Germany and other EC member countries according to the provisions of the Poland's association agreement with them (e.g. gradual reduction of customs duties, gradual extension of the so-called tariff quotas);
- f) inter-, and intra-industry complementarity caused by the differences in factor endowment, differences of relative prices of production factors and products, and due to technological differences.

While some of the above mentioned factors seem to be captured in gravity models of Havrylyshyn and Pritchett [1991] and of Döhrn and Milton [1991], there is no doubt that it is not the case of all of them. The consequences of gradual liberalization in accordance with the provisions of Poland's association agreement with the EC seem to be an example. With regard to these consequences for Poland's imports Langhammer [1992a] argues that the trade diversion effect will probably surpass the trade creation effect in the case of industrial products. According to him the development of the subsidized

EC countries' agricultural exports to Poland can be quite different. On the other hand, Lubinski and Sznajder [1992] calculated the so-called transfer effects of the association agreement and are arguing that due to the liberalization foreseen in this agreement, Poland's imports of industrial products will grow much faster than imports of agricultural goods. Taking into account the results of the analysis by Lubinski and Sznajder, as well as the share of Germany in total Poland's trade with the EC member countries, it can be concluded that the increase of Poland's imports from Germany due to the liberalization can range yearly between 2 % and 3 % of their average value in 1988-1990 in the next seven years while rather not exceeding 0.2 % in the case of agricultural products. However, also the supply side should be considered. A lot depends upon the progress of German economic unification in the next years. Additionally, it is to recognize that there existed (also in the interwar period) and still exists a specific gap between involvement of Germany and of other Western countries in East-West European trade. To put it in another way, Poland gravitates economically towards Germany but in the short run the room for response of other countries on the likely growing Poland's demand seems to be relatively larger than that of economically unifying Germany.

Poland's exports constituted the limiting factor of the Polish-German trade's expansion in the past and this was induced by its partners (e.g. their relatively low rates of growth in the 1970's, protectionism of the EC), as well as and rather mainly due to reasons dependent on Poland (e.g. difficulties to re-structure and to supply adequate products in the circumstances of the resource-constrained economy). Some of these reasons are still at work but much more optimism seems to be reasonable today than in the past. Also with regard to the factors exogenous from the Polish point of view. The most promising among them are the macroeconomic gains expected in Germany and other EC member countries from the completion of the program "Europe 1992" (an additional growth of 4.5 % to 7 % in Community GDP, the creation of 2 to 5 million new jobs), the macroeconomic gains expected after complete economic integration of Germany (e.g. an additional growth of 1 % to 1.5 %), as well as the effects of liberalization foreseen in the Poland's association agreement with the EC. With regard to the latter problem, the opinions of the economist are differentiated. According to Langhammer [1992a], the trade creation effect of the Poland's association agreement will be rather limited. On the other hand, taking into account the results of the analysis prepared by Lubinski and Sznajder [1992] one can estimate that increase of Poland's exports to Germany will reach per year 1 %-2 % of the average value of Poland's exports to this country in 1988-1990 in the case of industrial products, and almost the same can be the magnitude of increase in the case of agricultural products. Let us add to this that according to Tangermann [1992] the preferential margin for Poland in agricultural products can be estimated for 1992 at 34.4 millions of ECU (3.1 % of the total value of Poland's agricultural exports to all EC member countries). Generally, the possible effects of the gradual liberalization in the framework of the association agreement are rather limited from the Polish standpoint. Especially real exports' needs of Poland call for further liberalization. It can lead to an increase both in inter-industry trade and intra-industry trade.

The future level of Poland's competitiveness vis-à-vis Germany and the pattern of Polish-German division of labour seem to be the decisive factors when discussing the possibilities of expansion of bilateral turnover. All these will depend to a great extent upon relative prices of production factors.

The current structure of the division of labour between Poland and Germany comprises some risks for the future. From this point of view the most important one seems to be the extraordinary high share of natural resources'-intensive products in Poland's exports and even their increasing competitiveness in 1989-1991 (see tables 11 and 12). There are many arguments claiming that this situation should change and will probably change in the future, especially in the long run. Some factors not dependent upon Poland are of importance (e.g. low demand elasticities for natural resources, long-term tendencies of terms of trade on the world market). But more important seem to be some endogenous facts and tendencies. Firstly, as Bode et al. [1991] argue, due to the opening up of the Poland's national economy, due to the collapse of the former CMEA trade system and due to the establishing of the new institutional framework of economic relations between Eastern and Central European countries, the prices of imported raw resources (primarily from the former Soviet Union) increased substantially eroding clearly the earlier comparative advantage of Poland (and not only) in many branches and sections (e.g. oil refining industry). Secondly, today and in the future there is to take into account the disastrous environmental problems in the country (the situation in the Upper Silesia being the extreme case), as well as the growing costs of their elimination which are to be financed and which influence the extraction and production costs.⁴ Thirdly, the expected inflow and competition of various substitutes of some natural resources will lead to the inefficiency of their extraction in the country (e.g. oil vis-à-vis coal). Fourthly, some natural resource extraction industries in Poland (e.g. copper industry) have little or no potential to increase export volume unless it can attract foreign investment capital in order to upgrade operating facilities and environmental safeguards and these are the problems of their own. Fifthly and — as it seems — most importantly, the volume of the natural resources extracted in Poland is in the long run relatively limited and clearly decreasing.

There are still some possibilities in Poland to export natural resources and natural resources'-intensive products but their relative prices will be undoubtedly increasing. The same seems true with regard to the prices of forestry-intensive products. The forests constitute only about 27.8 % of the Poland's total area and the Polish forestry economy is relatively low efficient. According to Danielewski and Kloc [1991, p. 17], it produced in Poland in 1988 about 22.7 cubic hectometres of wood from 8.9 millions ha of forests, while in Western Germany the respective numbers were 34.9 cubic hectometres and 7.3 millions of ha. But more important seem to be the increasing costs of reforestation in Poland.

⁴ It is expected that the raise of domestic coal prices to world market levels will shut down many unproductive mines and that about the year 2000 Poland will stop exports of coal. See USITC [1991]; Danielewski, Kloc [1991].

Table 19 — Documented industrial assets of the most important mineral resources in Poland (state at 31.12.1988; millions of tons, gas in billions Nm³)

No.	Specification	Documented industrial assets	Extraction or production in 1988	Sufficiency of resources in years (1:2)
		1	2	3
1	Natural gas	124.50	5.50	22.6
2	Petroleum	11.32	0.16	8.3
3	Pit-coals	2 505.00	74.00	33.8
4	Coking coals	17 591.00	192.00	91.6
	Ores of metals			
5	Zinc	4.22	0.21	20.1
6	Lead	1.13	0.66	18.8
7	Copper	27.89	0.46	60.6
8	Iron	0.54	0.00	x
9	Sulphur	618.10	5.10	121.2
10	Rock-salt	25 381.00	4.20	6 043.0
11	Kaolin	69.00	1.00	69.0
12	Chalk	45.60	1.70	26.8
13	Ceramic sands	80.60	1.30	62.0
14	Limestones and marl	8 809.00	47.90	184.0

Source: Danielewski, Kloc [1991, p. 8].

Germany is a country with a clearly higher capital/labour ratio than Poland. Moreover, as Siebert [1991, p. 13] argues, economic integration of Germany "can be interpreted as the addition of qualified labour, land and a partially obsolete capital stock to the West German economy. Eventually the capital stock per worker in the area of the GDR will reach the West German level and the economic structure will tend to equalize.... Mobility of capital will be an important vehicle of adjustment ... starting at a low productivity level and an obsolete capital stock there will be a Schumpeterian growth process fuelled by capital and technology transfer, the founding of new firms and an organizational restructuring of industry". It is not an easy process [Schatz, Schmidt, 1992; Siebert, 1992b]. However, there seems to be no alternative solution.

In comparison with Germany, capital in Poland is a relatively scarce factor and therefore, a relatively more expensive. Moreover, Poland is heavily indebted and the collapse of the former CMEA trade system (mainly via more expensive imports of many natural resources from the former Soviet Union) diminishes the scope of possibilities of specialization in production of capital-intensive products.

The catching up process typically requires substantial saving and investment efforts and these requirements can be met in Poland in the future to some extent only. On the one hand, due to a relatively low level of GDP per capita in the country and due to many rigidities in the financial market, the domestic potential of saving is rather limited, and on the other, due to many reasons specified more precisely elsewhere (e.g. Glismann, Schrader, 1991; Misala, 1992d), inflows of foreign capital to Poland will be

probably not substantial in the next years. Anyway, it would be quite unreasonable to expect capital inflows of a size similar to those to the former GDR, as well as in a value which is necessary or which would be welcomed.

Table 20 — Eastern Europe and the former Soviet Union: Net Capital Flows under Three Alternative Scenarios (billions of US dollars per year)^a

Recipient	Scenarios according to Collins and Rodrik			Scenarios for Poland ^b		
	I	II	III	I	II	III
Eastern Europe	12	18	24	3.8	5.7	7.6
Soviet Union	-4	2	6	x	x	x
German unification	22	35	60	x	x	x
Total	30	55	90	3.8	5.7	7.6

^a Scenario I takes the lower bounds for estimates of Collins and Rodrik of likely net capital flows to each recipient. Scenario III takes the upper bounds. Scenario II provides an intermediate case. — ^b Author's calculations taking estimates of Collins and Rodrik and a 31.6 % share of Poland's population in the total population of the East European countries (31.6 %).

Source: Collins, Rodrik [1991, p. 90] and own calculations.

Relative scarcity of capital influences and will probably influence also in the future the relative price of labour (wage) and the relative price of land (land rent). There is to expect that labour and land will be in Poland relatively cheap. Therefore comparative advantages on specialization of this country in labour-intensive and land-intensive products are likely under market conditions. The less intensive inflows of capital to Poland is, the larger is the respective probability. As explained elsewhere [Collins, Rodrik, 1991; Misala 1992b], limited inflows of capital force to undervalue national currency and therefore also immobile production factors and tradables and non-tradables. By the way, there are some reasons to argue that the opposite can be true for Germany.

As Lorenz [1992, p. 32] underlines, there are big differences between western scholars' attitudes with regard to the human capital endowment of the East and Central European countries. Then he argues "Mit Recht wird eine technologieintensive Entwicklung neben Wechselkurseinflüssen von zwei wichtigen Standortfaktoren abhängig gemacht; zum einen vom Zufluß an Privatkapital und technischem Wissen (Direktinvestitionen etc.) und zum anderen von der Einschätzung gerade des endogenen Humankapitals durch die Investoren. In beiderlei Hinsicht gibt es inzwischen wohl wirklich leider weniger Anlaß zur Euphorie als 1989/90! ...läßt sich z.B. das, was wir unter den Stichworten 'exportgeführtes Wachstum' und 'Entwicklungsstaaten' intensiv durch die ostasiatischen NIEs kennengelernt haben, wirklich vergleichbar von Osteuropa erwarten?"

Table 21 — Comparison of Productivity Levels between Poland and West Germany at the Turn of the 1980's and 1990's (West Germany = 100)^a

Industry	Production brutto per 1 employee	Production per 1 US \$ of labour costs
Mining	10.5	117.9
Petroleum refined	14.1	195.8
Iron and steel mills	31.6	378.6
Iron and steel	48.8	532.8
Non-ferrous metals	30.7	309.7
Foundries	14.7	233.0
Machinery	13.2	210.4
Office machinery	7.2	161.5
Precision industry	12.5	188.9
Road motor vehicles	13.3	237.8
Ships and boats	11.2	138.3
Electr. engineering and electronics	14.2	249.4
Cable and wire industry	53.1	529.7
Chemicals	14.6	274.4
Synthetic plastics	33.6	448.4
Rubber	13.8	254.9
Mineral industry	10.5	182.8
Glass industry	11.3	177.0
Ceramic pottery industry	31.0	398.6
Wood and paper industry	7.6	143.8
Wood industry	8.8	127.4
Woodworks	13.7	212.4
Paper products	17.6	286.1
Textile industry	9.8	135.4
Clothing industry	6.8	86.6
Tanneries	13.2	198.6
Shoes	9.6	131.2
Food industry	15.2	207.8

^a Data for Poland from 1990 and data for West Germany from 1988.

Source: Zbytniewski [1991].

The precise assessment of Poland's endowment with human capital is a hard task. Taking as a proxy the relative productivity level (in comparison with West Germany), there appears a big gap and its reasons are well explained by Klodt [1991]. It is still difficult for scientists and researchers from Poland and other East and Central European countries to compete with their western colleagues on equal terms but it seems to be reasonable to argue that a lot of potential of creativity and entrepreneurship is available in these countries, and that with the inflows of foreign capital and technology, and with the emerging and stabilizing individuals' desire to improve quality of life the discussed gap can gradually decrease. By the way, the Asian NIEs needed clearly more than three years in order to catch up technologically. Moreover — as it seems — inflows of capital (with technology) are determined not only by the exchange rate policy and valuation of human capital by the foreign investors. There are much

more determinants dependent on Poland (e.g. continuing political and social concerns, partly convertibility of the currency only), but also some important factors dependent on Poland's economic partner. Let's mention one, very important from the Polish point of view — the massive absorption of capital by the process of German unification.

It is well-known in the economic theory that relative prices change with the growth of the economy (relative increase of wages etc.). According to available forecasts, the recovery of the Poland's economy may begin in 1993 but it would be not reasonable to overestimate the influence of economic growth on structural changes in the country, and therefore also on relative prices in the coming years (let's say until 2005). On the one hand, the specific post-socialist structures seem to be very rigid (highly inelastic) to market signals. On the other one, the relatively quick changes of these structures require i.a. tremendous inter-sectoral and inter-regional transfers of labour under conditions of already high unemployment rate (12.6 % in June 1992), shortages of flats, clear infrastructural deficiencies etc.

With regard to structural adjustment, just agriculture seems to be the most rigid (inelastic) sector of the Poland's economy in the following 5-15 years. Simultaneously, its problems and potentials are to be taken into account when discussing the prospects of division of labour between Poland and Germany. The following aspects appear to be the most important from the Polish perspective:

- a) shares of the Poland's agriculture in GDP, employment and foreign trade (especially in exports directed mainly to Germany and other EC member countries) are relatively high and will probably decrease rather very slowly. Just to show the scope of the problem, it would be necessary to remove 85.8 % of all employed in Polish agriculture to other sectors (about 3.8 millions of people) in order to get the employment structure of West Germany in 1989;
- b) agriculture plays an important role in the Poland's transformation process and stabilization policy (the most privatized sector in the country which should respond to market incentives, hold back rural-to-urban migration, absorb to some extent the unemployed from the industrial sector etc.);
- c) agriculture is of great importance to the social and political equilibrium of the country and with a progress of privatization of the agriculture's upstream and downstream sectors just agriculture should contribute substantially to the recovery of the national economy;
- d) some sectors of the Poland's agriculture seem to reveal comparative advantage but the distorted international agricultural markets do not guarantee price competitiveness and/or increasing market shares (e.g. fresh and preserved meat, fish, fruit and vegetables, and related products);
- e) an increase of the comparative advantage of the Poland's agriculture can be expected with the progress of transformation and privatization processes, as well as a result of changes in relative prices of production factors.

While not disregarding agriculture, just Poland's industry is to be treated as the "locomotive of growth" of the country (generally and of exports) in the long run. Data in table 21 show the several times higher productivity in Germany's industry than in Poland's one at the turn of the 1980's and 1990's, while wood and paper industry being the extreme cases (productivity proportions over 1:13). Since wages in Poland are much lower (wages' competitiveness), production per one US \$ of labour costs is higher. However, as it can be seen from the presented data, the lower labour costs did pay off for lower productivity in the analysed years in the case of some industries only (iron and steel industry, cable and wire industry, synthetic plastics, ceramic and pottery). This confirms the earlier conclusion that Poland currently reveals vis-à-vis Germany a comparative advantage in the labour- and capital-intensive industries. There seems additionally true that their number is limited due to many rigidities in the labour market and due to the mistakes in economic policy.

The above mentioned rigidity of the post-socialist structures (to be observed in the case of Poland's industry, too), as well as eventual, further mistakes with regard to wage policies may result in a rigidity of the structure of division of labour between Poland and Germany; the structure could remain almost unchanged in the short run. In the long run, however, it seems reasonable to assume the labour-intensive industries of Poland as the "engines of growth" of its economy and of its exports (e.g. printing, textiles, chemicals, wood products, pottery and chinaware, fabricated metal products, electrical equipment). Moreover, with the progress of transformation and privatization processes in Poland and providing the inflows of foreign technology, the most likely result will be an initial increase of Poland's comparative advantages in unskilled labour-intensive products, and then gradually (to some extent simultaneously) in skilled labour-intensive ones. Approaching the problem from the other side and applying the neo-technology accounts of international trade, there seems reasonable to share the opinion of Klodt [1991] that more intensive economic cooperation of Poland and other East and Central European countries with the West will drive their industry structures towards such mobile Schumpeter industries like chemicals and chemical-related products, transport equipment, electrical engineering or electronics. With regard to Poland, two aspects seem to be of great importance. First, productivity increases are likely to be pronounced in these industries. Second, wage push is and probably will be much less important than in East Germany. All this can result in the convergence of real income levels as predicted by the Heckscher-Ohlin-Samuelson theory and in the convergence of technological levels as predicted by neo-technology accounts of international trade.

Services were clearly neglected in Poland in the past but there is a significant middle- and long-term potential for their development, while this neglect being one of the most important reasons. The shift towards service sector has begun in Poland after 1989 and it will probably continue in the future. There is first and foremost to take into account the above mentioned problem of removal of relatively well-skilled and cheap labour from agriculture to other sectors, and — in the long run — to service sector especially (according to own estimates the problem comparable to that of removal of labour

from the Polish agriculture). The next important point is that due to many reasons Poland reveals a comparative advantage in some sectors of services (e.g. tourism, building services and probably also some transport services), and these advantages can be extended. Let us mention investments in the broadly understood tourist or transport infrastructure, in telecommunications or in the foreign-language assistance. Anyway, the experience of the EC peripheral member states shows that they can supply the "European core" with some sorts of services, that they need them in their integration process with the original "Six", and that they can be more or less successful [Ilzkowitz, 1991; Misala, 1992c]. As it seems, these experiences can be repeated to a great extent when looking eastwards from Germany and westwards from Poland.

On the other side, there are services with a clear disadvantage of Poland (banking, insurance, advertising, consulting etc.). The processes of transformation and of opening up Poland's economy create an increased demand for them and it will probably continue in the future. There is only a problem of payments.

The future division of labour between Poland and Germany will be rather undoubtedly characterized by the growing intra-industry specialization and this in turn should increase wealth and economic interdependence as a consequence of enlargement of markets which makes more varieties of goods and their parts more feasible and lowers prices by utilizing economies of scale. According to the theory, more intensive intra-industry trade will also decrease costs of restructuring and thus increase wealth, too. However, it wouldn't be reasonable to overestimate these gains in Polish-German trade relations. First, the eventual substantial catching up of Poland with regard to GDP per capita and technological standards is a long process burdened with enormous difficulties. Second, the intra-industry trade theory emphasizes that the intensity of the intra-industry division of labour is the highest between countries with a similar factor endowment and similar (but simultaneously differentiated) structures of production, and it will be probably not the case in relations between Poland and Germany in the next 10-20 years. Third, this theory additionally emphasizes that even among countries interrelated by trade and with the similar structures of factor endowment, as well as of production and consumption, the economic cooperation can create and intensify intra-industry trade if a potential exists for full specialization and utilization of scale economies and this in turn is only possible in the framework of full liberalization. This seems to be wishful thinking at the moment bearing in mind past experiences and probable adjustment pressures and their costs.

As in the case of the inter-industry division of labour between Poland and Germany, the future of the Polish-German intra-industry trade seems to evaluate according to the lessons stemming from a "stage-of-development" approach. There is to expect that the changes in the structure of intra-industry trade between Poland and Germany will simply reflect evolution of Poland's comparative advantages by factor intensity. It means a continuation of process of gradual shifts of intra-industry trade in natu-

ral resources'-intensive and unskilled labour-intensive branches to skilled labour-intensive and technology-intensive ones. To put it in other way, on the one hand, there is to expect a worsening of Poland's trade performance in some traditionally strong branches such as fats, oils, footwear, clothing, textiles etc., and on the other, its position in branches and sectors with a more high technology content may be improved.

The higher stage of economic development reached by Germany compels Poland to follow a strategy of catching up (also on technology) and of structural adjustment. This strategy has many advantages such as a cheaper access to technology than the costs of own R&D endeavours or the possibilities to imitate. However, there is also the second side of the problem. The superior economic position of Germany could provide a base for both a non-intentional as well as an intentional domination effect. Policy-makers should take these facts into account, draw the conclusions and facilitate a dialogue which is obviously necessary.

ANNEX

Table 1 — Commodity Pattern of Poland's Trade with Germany by Sections of the CN in 1989–1991 (% , current prices)

Sections	Specification	Poland's imports			Poland's exports		
		1989 ^a	1990	1991	1989 ^a	1990	1991
I	Live animals and animal products	5.1	1.1	2.9	12.1	9.7	6.4
II	Vegetable products	10.6	1.4	1.6	5.7	4.0	3.8
III	Animal or vegetable fats and oils and wares	1.9	1.3	1.7	0.4	0.3	0.2
IV	Prepared foodstuffs, beverages and tobacco	3.6	4.37	4.8	5.6	3.2	3.1
V	Mineral products	2.4	5.1	5.9	10.4	12.5	15.7
VI	Chemicals and products of allied industries	14.6	11.7	18.7	7.2	8.2	8.5
VII	Plastics, rubber and related articles	4.9	4.4	4.5	2.2	2.4	2.7
VIII	Raw hides and skins, leather, travel goods	0.4	0.2	0.4	0.5	0.4	0.7
IX	Wood, cork and related articles	0.0	0.0	0.2	2.6	2.6	2.8
X	Pulp of wood, paper and paperboard, scrap	1.1	1.1	2.2	1.5	1.3	1.8
XI	Textiles and textile articles	3.3	2.7	3.5	2.6	2.7	2.4
XII	Footwear, headgear, umbrellas, artificial flowers	0.4	0.7	0.7	1.1	1.0	1.4
XIII	Articles of stove, plater, cement, asbestos etc.	0.8	1.3	0.6	1.7	2.3	0.5
XIV	Pearls, precious stones and metals	0.1	0.1	0.0	1.2	0.7	0.8
XV	Base metals and articles of base metal	11.6	10.5	7.4	31.7	32.6	26.6
XVI	Machinery and mechanical appliances, equipment etc.	33.4	46.2	35.7	8.1	9.7	12.9
XVII	Vehicles, aircraft, vessels and equipment	2.4	3.2	4.5	0.8	1.5	4.0
XVIII	Optical and photographic instruments and apparatus	3.1	3.9	3.9	0.4	0.5	0.7
XIX	Arms and ammunition	0.0	0.0	0.0	0.0	0.0	0.0
XX	Miscellaneous manufactured articles	0.2	0.9	0.8	4.2	4.3	4.9
XXI	Works of art, collectors pieces and antiques	0.0	0.0	0.0	0.0	0.0	0.0
	Products not specified elsewhere	0.1	0.0	0.0	0.0	0.1	0.1
Total		100.0	100.0	100.0	100.0	100.0	100.0

^aTrade with the Federal Republic of Germany only.

Source: CIHZ, [1992]; own calculations.

Table 2 — RCA Indicators in Poland's Trade with Germany at the Two-Digit Level of the CN in 1989-1991

CN Code	Specification	1989 ^a	1990	1991
01	Live animals	4.85	4.87	0.67
02	Meat and plucks	0.30	1.60	0.21
03	Fish and crustaceans	4.39	3.16	2.42
04	Dairy products, eggs and honey	-0.69	-0.01	-1.52
05	Other animal products	3.34	2.55	3.29
06	Live plants and trees, bulbs, cut flowers	3.43	3.77	4.82
07	Edible vegetables, roots tubers	—	6.79	5.44
08	Edible fruit and nuts	1.46	1.16	0.66
09	Coffee, tea, mate and spices	—	-1.65	—
10	Cereals	-3.55	2.46	2.28
11	Products of the milling industry, malt etc.	-3.02	0.58	-0.41
12	Oils seeds and fruits, grains, straw and fodder	2.19	3.24	1.12
13	Lacs, gums, resins and other vegetable saps	—	—	—
14	Vegetable plaiting materials	-2.34	-3.08	-1.68
15	Animal or vegetable fats and oils	-1.54	-1.33	-2.07
16	Preparations of meat, fish and crustaceans	2.98	2.94	2.04
17	Sugar and sugar confectionery	1.05	0.01	0.45
18	Cocoa and cocoa preparations	0.40	-2.67	-0.87
19	Preparations of cereals, flour, starch or milk	1.20	-3.08	-6.67
20	Preparations of vegetables, fruit and nuts	3.59	1.81	3.12
21	Miscellaneous edible preparations	-3.64	-4.41	-1.91
22	Beverages, spirits and vinegar	-1.22	-0.90	-0.40
23	Residues from the food industries and fodder	-0.53	-0.26	-2.21
24	Tobacco and manufactured tobacco substitutes	1.28	-0.63	-3.71
25	Salt, sulphur, earths, stone, cement etc.	-0.25	1.35	1.89
26	Ores, slag and ash	-2.27	-3.03	-4.01
27	Mineral fuels and oils, waxes	2.94	1.53	1.39
28	Inorganic chemicals, compounds of metals	-0.02	0.62	0.43
29	Organic chemicals	-0.38	-0.41	-0.43
30	Pharmaceutical products	-2.59	-2.44	-3.47
31	Fertilisers	2.81	4.04	0.39
32	Tanning or dyeing extracts, dyes, pigments	-0.31	-0.16	-1.49
33	Essential oils and resinoids, perfumery	-3.49	-3.79	-4.18
34	Soap, washing preparations	-2.71	-3.11	-4.92
35	Albuminoidal substances	1.76	0.73	-0.17
36	Explosives, pyrotechnic products, matches	-0.11	2.21	1.19
37	Photographic or cinematographic goods	-1.41	-1.58	-4.81
38	Miscellaneous chemical products	-2.67	-1.95	-3.09
39	Plastics and articles thereof	-0.94	-0.74	-0.64
40	Rubber and articles thereof	-0.41	-0.10	-0.15
41	Raw hides and skins and leather	-1.13	0.16	-0.38
42	Articles of leather	3.53	1.70	1.90
43	Furskins and artificial fur	2.67	4.15	2.76
44	Wood and articles of wood	4.64	4.15	2.76
45	Cork and articles of cork	—	—	—
46	Manufactures of straw and other plaiting materials	—	8.40	0.09
47	Pulp of wood or of other cellulosic material	1.45	-0.48	-0.84
48	Paper and paperboard	0.38	0.41	0.05
49	Printed backs, newspapers, pictures etc.	-1.93	-2.09	-2.28
50	Silk	-0.03	0.24	-2.21
51	Wool, animal hair, yarn and woven fabric	0.71	-1.45	-1.26
52	Cotton	-0.44	-0.17	-2.26
53	Other vegetable textile fibres, paper yarn	2.94	5.89	-2.76

Table 2 continued

CN Code	Specification	1989 ^a	1990	1991
54	Man-made filaments	-2.84	-0.33	-0.08
55	Man-made staple fibres	-1.66	-0.49	-1.11
56	Wadding, felt and not-woven special yarns	-1.25	-1.56	-2.96
57	Carpets and other textile floor coverings	1.08	-0.14	1.63
58	Special woven fabrics, tufted textile fabrics	0.87	-0.08	0.38
59	Impregnated, coated or laminated textile fabrics	-3.24	-2.67	-2.75
60	Knitted or crotched fabrics	1.09	1.22	1.17
61	Articles of apparel and clothing articles knitted or crotched	-0.09	1.14	0.51
62	Not knitted or crotched articles of apparel and clothing	-0.38	-0.34	-0.01
63	Other made up textile articles	1.34	1.98	0.92
64	Footwear, garters and the like	1.08	0.41	0.77
65	Headgear and parts thereof	—	1.94	4.28
66	Umbrellas, sticks, whips, riding-crops	—	—	—
67	Prepared feathers and down	—	—	—
68	Articles of stone, plaster, cement, asbestos etc.	-1.32	-1.20	-0.55
69	Ceramic products	-1.02	-0.79	-0.25
70	Glass and glasware	1.79	1.76	1.09
71	Pearls, precious stones and metals	2.58	2.01	3.29
72	Iron and steel	0.48	0.60	0.66
73	Articles of iron and steel	0.46	0.85	1.24
74	Copper and articles thereof	3.78	3.159	4.59
75	Nickel and articles thereof	—	0.87	-2.75
76	Aluminium and articles thereof	-2.86	-0.82	0.32
78	Lead and articles thereof	—	0.73	0.64
79	Zinc and articles thereof	6.95	2.01	8.88
80	Tin and articles thereof	—	—	—
81	Other base metals, cements and articles thereof	-1.92	-3.18	-2.88
82	Tools, implements, cutlery, spoons and forks	-0.16	-0.38	0.03
83	Miscellaneous articles of base metal	0.19	-0.17	0.20
84	Nuclear reactors, boilers, machinery and appliances	-1.87	-1.95	-1.43
85	Electrical machinery and equipment, recorders etc.	-0.55	-1.00	-0.53
86	Locomotives, rolling-stock, track fixtures	1.04	0.46	-1.37
87	Vehicles other than railway or tramway rolling-stock	-1.42	-1.91	-0.65
88	Aircraft, spacecraft and parts thereof	-0.92	-2.27	0.08
89	Ships, boats and floating structures	0.32	1.22	2.10
90	Instruments and apparatus	-2.09	-2.08	-1.69
91	Clocks and watches and parts thereof	-1.25	-2.06	-3.13
92	Musical instruments	0.22	-0.27	-1.38
93	Arms and ammunition	-1.22	-2.60	-2.56
94	Furniture, bedding, mattresses, lamps	4.13	3.64	4.34
95	Toys, games and sports requisites	0.64	-1.42	-1.63
96	Miscellaneous manufactured articles	-0.80	-1.76	-1.24
97	Works of art, collectors' pieces and antiques	—	—	1.58

^a Trade with the Federal Republic of Germany only.

Source: CIHZ [1992]; own calculations.

Table 3 — Division of Products Traded Between Poland and the EC Member Countries by Factor Intensities (CN Codes at the Two-Digit Level)^a

Land-intensive products	Raw resources'-intensive products	Capital-intensive products	Labour-intensive products	Technology-intensive products
01	25	11	16	84
02	26	15	20	85
03	27	17	21	88
04	28	18	23	90
05	29	19	41	
06	31	22	42	
07	32	24	43	
08	33	30	46	
10	34	37	56	
12	35	38	57	
13	36	49	58	
14	39	54	59	
44	40	55	60	
45	47	82	61	
50	48	83	62	
51	53	86	63	
	64	87	65	
	67	89	66	
	68	93	91	
	69		92	
	70		94	
	71		95	
	72		96	
	73		97	
	74			
	75			
	76			
	78			
	79			
	80			
	81			

^a Omitted are sections 09 (coffee, tea, mate and spices) and 52 (cotton). These products are traded between Poland and the EC member countries, but originally are not produced there.

Source: Own proposal discussed in the Kiel Institute of World Economics.

Table 4 — Structure of Poland's Imports from Germany by Factor Intensities at the Four-Digit Level of the CN in 1989-1991^a (%)

Specification	1989 ^b	1990	1991
Land-intensive products	22.8	9.1	14.4
Forest-intensive products	0.8	0.8	1.0
Natural resources'-intensive products	6.6	5.4	4.0
Labour-intensive products	25.1	27.8	23.7
Capital-intensive products	17.9	18.2	27.9
Technology-intensive products	26.8	38.8	29.0
Total	100.0	100.0	100.0
Land-intensive products			
both of vegetable and animal origin	1.0	2.9	2.4
of vegetable origin (not processed)	11.8	1.5	2.4
of vegetable origin (processed)	3.1	3.1	5.5
of animal origin (not processed)	5.8	1.3	3.5
of animal origin (processed)	1.1	0.4	0.5
Forest-intensive products			
not processed	0.0	0.0	0.0
processed	0.7	0.7	0.9
Natural resources'-intensive products	6.6	5.4	4.0
Labour-intensive products			
skilled-labour intensive products	19.7	22.1	18.5
unskilled-labour intensive products	5.4	5.7	5.2
Capital-intensive products	17.9	18.2	27.1
Technology-intensive products			
easy to imitate	22.4	32.1	25.9
difficult to imitate	4.4	6.7	3.1
Total	100.0	100.0	100.0
^a Indicators may not add perfectly due to roundings. — ^b Trade with the Federal Republic of Germany only.			

Source: CIHZ [1992]; own calculations.

Table 5 — Structure of Poland's Exports to Germany by Factor Intensities at the Four-Digit Level of the CN in 1989-1991^a (%)

Specification	1989 ^b	1990	1991
Land-intensive products	18.0	12.0	6.5
Forest-intensive products	4.7	5.0	5.7
Natural resources'-intensive products	10.5	12.7	15.8
Labour-intensive products	15.4	18.5	21.7
Capital-intensive products	46.5	45.3	43.1
Technology-intensive products	5.0	6.5	7.1
Total	100.0	100.0	100.0
Land-intensive products			
both of vegetable and animal origin	0.0	0.0	0.3
of vegetable origin (not processed)	5.7	3.3	1.9
of vegetable origin (processed)	3.2	1.9	2.0
of animal origin (not processed)	7.0	5.2	1.2
Forest-intensive products			
not processed	1.1	1.0	1.4
processed	3.6	4.0	4.4
Natural resources'-intensive products	10.5	12.7	15.8
Labour-intensive products			
skilled labour-intensive products	5.3	7.9	9.7
unskilled labour-intensive products	10.1	10.6	12.1
Capital-intensive products	46.5	45.3	43.1
Technology-intensive products			
easy to imitate	4.6	6.1	6.7
difficult to imitate	0.3	0.4	0.4
Total	100.0	100.0	100.0
^a Indicators may not add perfectly due to roundings. — ^b Trade with the Federal Republic of Germany only.			

Source: CIHZ [1992]; own calculations.

Table 6 — IIT Indicators in Poland's Trade with Germany at the Two-Digit Level of the CN in 1989-1991

CN Code	Specification	1989 ^a	1990	1991
01	Live animals	0.02	0.01	0.39
02	Meat and plucks	0.92	0.20	0.56
03	Fish and crustaceans	0.03	0.05	0.08
04	Dairy products, eggs and honey	0.61	0.71	0.63
05	Other animal products	0.08	0.08	0.04
06	Live plants and trees, bulbs, cut flowers	0.07	0.03	0.01
07	Edible vegetables, roots tubers	0.00	0.00	0.00
08	Edible fruit and nuts	0.42	0.29	0.40
09	Coffee, tea, mate and spices	0.00	0.52	0.00
10	Cereals	0.05	0.09	0.09
11	Products of the milling industry, malt etc.	0.08	0.47	0.83
12	Oils seeds and fruits, grains, straw and fodder	0.23	0.04	0.27
13	Lacs, gums, resins and other vegetable saps	0.00	0.00	0.00
14	Vegetable plaiting materials	0.16	0.16	0.56
15	Animal or vegetabel fats and oils	0.32	0.65	0.42
16	Preparations of meat, fish and crustaceans	0.11	0.06	0.12
17	Sugar and sugar confectionary	0.57	0.71	0.47
18	Cocoa and cocoa preparations	0.87	0.22	0.94
19	Preparations of cereals, flur, starch or milk	0.51	0.15	0.01
20	Preparations of vegetables, fruit and nuts	0.06	0.16	0.04
21	Miscellaneous edible preparations	0.05	0.04	0.48
22	Beverages, spirits and vinegar	0.41	0.85	0.83
23	Residues from the food industries and fodder	0.68	0.83	0.38
24	Tobacco and manufactured tobacco substitutes	0.48	0.98	0.09
25	Salt, sulphur, earths, stone, etc.	0.81	0.25	0.13
26	Ores, slag and ash	0.17	0.16	0.07
27	Mineral fuels and oils, waxes	0.12	0.21	0.21
28	Inorganic chemicals, compounds of metals	0.92	0.46	0.47
29	Organic chemicals	0.75	0.90	0.85
30	Pharmaceutical products	0.12	0.28	0.12
31	Fertilizers	0.13	0.02	0.49
32	Tanning or dyeing extracts, dyes, pigments	0.78	0.79	0.64
33	Essential oils and resinoids, perfumery	0.05	0.08	0.06
34	Soap, washing preparations	0.11	0.15	0.03
35	Albuminoidal substances	0.33	0.42	0.72
36	Explosives, pyrotechnic products, matches	0.88	0.11	0.25
37	Photographic or cinematographic goods	0.35	0.55	0.03
38	Miscellaneous chemical products	0.11	0.41	0.18
39	Plastics and articles thereof	0.51	0.93	0.95
40	Rubber and articles thereof	0.73	0.76	0.71
41	Raw hides and skins and leather	0.44	0.64	0.82
42	Articles of leather	0.07	0.18	0.13
43	Furskins and artificial fur	0.15	0.16	0.50
44	Wood and articles of wood	0.02	0.02	0.06
45	Cork and articles of cork	0.00	0.00	0.00
46	Manufactures of straw and other plaiting materials	0.00	0.00	0.06
47	Pulp of wood or other cellulosic material	0.42	0.94	0.95
48	Paper and paperboard	0.88	0.53	0.62
49	Printed books, newspapers, pictures etc.	0.22	0.53	0.36
50	Silk	0.92	0.61	0.37
51	Wool, animal hair, yarn and woven fabric	0.72	0.60	0.75
52	Cotton	0.72	0.79	0.36

Table 6 continued

CN Code	Specification	1989 ^a	1990	1991
53	Other vegetable textile fibres, paper yarn	0.11	0.00	0.24
54	Man-made filaments	0.10	0.86	0.68
55	Man-made staple fibres	0.28	0.95	0.82
56	Wadding, felt and not-woven special yarns	0.34	0.55	0.20
57	Carpets and other textile floor coverings	0.56	0.78	0.17
58	Special woven fabrics, tufted textile fabrics	0.65	0.75	0.49
59	Impregnated, coated or laminated textile fabrics	0.07	0.23	0.24
60	Knitted or crotched fabrics	0.56	0.28	0.26
61	Articles of apparel and clothing articles knitted or crotched	0.89	0.30	0.44
62	Not knitted or crotched articles of apparel and clothing	0.75	0.87	0.65
63	Other made up textile articles	0.46	0.14	0.32
64	Footwear, garters and hike	0.56	0.53	0.36
65	Headgear and parts thereof	0.00	0.15	0.01
66	Umbrellas, sticks, whips, riding-crops	0.00	0.00	0.00
67	Prepared feathers and down	0.00	0.00	0.00
68	Articles of stone, plaster, cement, asbestos etc.	0.38	0.71	0.90
69	Ceramic products	0.48	0.91	0.76
70	Glass and glassware	0.32	0.17	0.28
71	Pearls, precious stones and metals	0.16	0.14	0.04
72	Iron and steel	0.83	0.46	0.40
73	Articles of iron and steel	0.84	0.38	0.24
74	Copper and articles thereof	0.05	0.03	0.01
75	Nickel and articles thereof	0.00	0.37	0.24
76	Alluminium and articles thereof	0.10	0.89	0.51
78	Lead and articles thereof	0.00	0.42	0.40
79	Zinc and articles thereof	0.01	0.14	0.00
80	Tin and articles thereof	0.00	0.00	0.00
81	Other base metals, cermetes and articles thereof	0.23	0.14	0.21
82	Tools, implements, cuttlery, spoons and forks	0.85	0.89	0.63
83	Miscellaneous articles of base metal	0.98	0.79	0.56
84	Nuclear reactors, boilers, machinery and appliances	0.24	0.41	0.67
85	Electrical machinery and equipment, recorders etc.	0.67	0.80	0.89
86	Locomotives, rolling-stock, track fixtures	0.58	0.52	0.70
87	Vehicles other than railway or tramway rolling-stock	0.35	0.43	0.95
88	Aircraft, spacecraft and parts thereof	0.51	0.32	0.61
89	Ships, boats and floating structures	0.91	0.28	0.11
90	Instruments and apparatus	0.19	0.37	0.56
91	Clocks and watches and parts thereof	0.40	0.38	0.17
92	Musical instruments	0.96	0.84	0.69
93	Arms and ammunition	0.41	0.24	0.28
94	Furniture, bedding, mattresses, lamps	0.04	0.03	0.01
95	Toys, games and sports requisites	0.75	0.61	0.59
96	Miscellaneous manufactured articles	0.56	0.48	0.76
97	Works of art, collectors' pieces and antiques	0.00	0.00	0.18
	Non-weighted average	0.37	0.39	0.37
	Standard deviation	0.32	0.31	0.30
	Weighted average	0.31	0.32	0.31

^a Trade with the Federal Republic of Germany only.

Source: CIHZ [1992]; own calculations.

BIBLIOGRAPHY

- AUSSENHANDEL [1991] "Zusammenfassende Übersichten für den Außenhandel", Außenhandel, Fachserie 7, Wiesbaden.
- BALASSA B. [1976], "Studies in Trade Liberalisation", Baltimore.
- BERGEIJK van P.A.G., Oldersma H. [1990] "Detente, Market-oriented Reform and German Unification; Potential Consequences for the World Trade System", *Kyklos*, vol. 43, No. 4.
- BLAHUT K.J. [1975] "Polsko - niemieckie stosunki gospodarcze w latach 1919-1939" (Polish-German Economic Relations in 1919-1939), Wrocław.
- BODE et al [1991], Bode E., Heitger B., Polkowski A., Schrader K. [1991] "Die RGW-Länder als Unternehmensstandort — Länderstudie Polen", Hamburg-Kiel.
- BOLZ K. [1988] "Bilaterale Außenwirtschaftsbeziehungen zwischen Polen und der Bundesrepublik Deutschland", *Osteuropa*, Jg. 38, Nr. 7-8.
- , Pissula P. [1982] "Die Erfahrungen deutscher Unternehmen aus der Kooperation mit polnischen Wirtschaftsorganisationen", Hamburg.
- BOZYK P., Wojciechowski B. [1971] "Handel zagraniczny Polski 1945-1969" (Poland's Foreign Trade 1945-1969), Warszawa.
- CIHZ [1992], "Handel z krajami EWG, 1989-1991" (Trade with the EC Member Countries 1989-1991), Centrum Informatyk Handlu Zagranicznego (Foreign Trade Informatics Centre), Warszawa, data on magnetic tapes.
- COLLINS S.M., Rodrik D. [1991], "Eastern Europe and the Soviet Union in the World Economy", Washington.
- CZUBINSKI A. ed. [1988] "PRL-RFN. Blaski i cienie normalizacji wzajemnych stosunkow" (Polish Peoples' Republik — Federal Republic of Germany. Positive and Negative Sides of their Mutual Relations), Poznań.
- DANIELEWSKI J., Kloc M. [1991] "Miedzy Wschodem a Zachodem; gospodarcze miejsce Polski w Europie dzis i jutro" (between East and West; Economic Place of Poland in Europe Today and Tomorrow), Warszawa.
- DÖHRN R., Milton A.-R. [1992] "Zur künftigen Einbindung der osteuropäischen Reformländer in die Weltwirtschaft", *RWI-Mitteilungen*, Jg. 43, Nr. 1.
- DR [1962] "Der kriegswirtschaftliche Beitrag Osteuropas für das Deutsche Reich 1936-1944", Institut für Weltwirtschaft, Kiel, mimeo.
- DZIEWULSKI K. [1992] "Prywatni w handle zagranicznym" (The Private Persons and Enterprises Engaged in Foreign Trade), *Zycie Gospodarcze* (Economic Life, weekly) from 23.III. 1992.
- GIERSCH H. ed. [1978] "On the Economics of Intra-Industry Trade", Tübingen.
- GLISMANN H.H., Schrader K. [1991] "Zur ordnungspolitischen Situation in den Ländern Osteuropas", *Die Weltwirtschaft*, Heft 2.

- GRUBEL H.G., Lloyd P. [1975] "Intra-Industry trade. The theory and measurement of trade in differentiated products", New York.
- GUS [1939] "Handel zagraniczny Polski", (Polish Foreign Trade), Warszawa.
- GUS [1991] "Rocznik Statystyczny Handlu Zagranicznego 1991" (Statistical Yearbook of Foreign Trade 1991), Warszawa.
- HAVRYLYSKYN O., Pritchett L. [1991] "European Trade Patterns after the Transition", PRE Working Papers, No. 748, World Bank, Washington, 1991.
- HEIDUK et al. [1991], Heiduk G., Ladyka S., Misala J., Wingender P. eds. "Deutsch-polnische Gemeinschaftsunternehmen", Hamburg.
- HEITGER B. [1990] "Wirtschaftliches Wachstum in Ost und West im internationalen Vergleich seit 1950", Die Weltwirtschaft, Nr. 1.
- HUFBAUER G.C. [1970] "The Impact of National Characteristics and Technology on the Commodity Composition of Trade in Manufactured Products" in: Vernon R. ed. [1970].
- HUGHES G., Hare P. [1991] "Competitiveness and Industrial Restructuring in Czechoslovakia, Hungary and Poland", European Economy, Special edition, No. 2., Brüssel.
- , --, [1992] "Industrial Policy and Restructuring in Eastern Europe", Centre for Economic Policy Research, Discussion Paper Series, No. 653, London.
- ILZKOWITZ F. [1991] "European Integration and Structural Adjustment; The case of the Peripheral Countries", Economisch en social tijdschrift, vol. 45, No. 2.
- INFORMACJE [1992] "Handel Zagraniczny, styczen-grudzien 1991, dane ostateczne (Foreign Trade, January-December 1991, Definitive Results), Warszawa.
- INSTYTUT ZACHODNI [1990] "Stosunki polsko-niemieckie 1918-1932 (Relations between Poland and Germany in 1918-1932), Poznan.
- KLODT H. [1991] "Comparative Advantage and Prospective Structural Adjustment in Eastern Europe", Kiel Working Papers, No. 477, Institut für Weltwirtschaft, Kiel.
- KONOVALOW V. [1989] "Poland: Competitiveness of Industrial Activities: 1961-1986", Washington.
- KOSTROWICKA J. Landau Z., Tomaszewski J. [1975] "Historia gospodarcza Polski XIX i XX wieku" (Polish Economical History in XIX-th and XX-th Century), Warszawa.
- KOSZEK J. ed. [1986] "Polska a RFN. Aktualnosc i przyszlosc stosunkow" (Poland and FRG. Actual and Future Problems of Bilateral Relations), Bydgoszcz.
- KOTYNSKI J. ed. [1988] "Oценка методологии и вынйк бадан конкuerенcyннoсcи польского прeмьислу прeз зeспoл з Бaнкy Свaтoвeгo" (An Evaluation of the Methodology and Results of Research-Work Prepared by the World Bank Team and Concerning Competitiveness of the Polish Industry", Instytut Koniunktur i Cen Handlu Zagranicznego (Foreign Trade Research Institute), Warszawa, mimeo.
- KRASUSKI J. [1964] "Stosunki polsko-niemieckie 1926-1932" (Economic Relations between Poland and Germany in 1926-1932), Poznan.

- LAMBRECHT H., Machowski H. [1991] "Zum Handel Ostdeutschlands", BIW, Berlin, mimeo.
- LANGHAMMER R.J. [1992 a] "Die Assoziierungsabkommen mit der CSFR, Polen und Ungarn; Wegweisend oder Abweisend?" Kieler Diskussionsbeiträge, Nr. 182, Institut für Weltwirtschaft, Kiel.
- , [1992 b] "Die Auswirkungen der EG-Handelspolitik gegenüber Mittel- und Osteuropa", Institut für Weltwirtschaft, mimeo.
- LEAMER E.E. [1984] "Sources of International Comparative Advantage", Cambridge.
- LORENZ D. [1992] "Einordnung der Länder Mittel- und Osteuropas in die Weltwirtschaft, insbesondere in den europäischen Wirtschaftsraum" in: Wegner [1992].
- LUBINSKI M. Sznajder A. [1992] "Analiza wpływu postanowien umowy handlowej Polski z EWG na polski eksport i import" (An Analysis of Influence of the Content of the Trade Agreement between Poland and the EEC on Poland's Exports and Imports), Warsaw School of Economics, Warsaw, mimeo.
- MANGE P.J. [1990] "Deutsch-Französischer Handel. Eine empirische auf güterwirtschaftlichen Theorien des Aussenhandels basierende Analyse", Frankfurt am Main.
- MARTOWSKI A., Wieczorkiewicz A. [1986] "Stan i perspektywy polsko-zachodnioniemieckiej współpracy gospodarczej" (Actual Problems and Perspectives of Economic cooperation between Poland and West Germany), Sprawy Międzynarodowe (International Affairs), No. 1.
- MISALA J. [1979] "Tendencje i czynniki rozwoju handlu Polska-RFN" (Tendencies and Factors Influencing Trade between Poland and FRG), Sprawy Międzynarodowe (International Affairs), No. 2.
- , [1992 a] "Einige Anmerkungen zu den Auswirkungen der deutschen Vereinigung auf die polnische Wirtschaft", Kieler Arbeitspapier Nr. 502, Institut für Weltwirtschaft, Kiel.
- , [1992 b] "Pattern of the Division of Labour between Poland and Member Countries of the European Communities", Kiel Working Paper, No. 536, Kiel Institute of World Economics, Kiel.
- , [1992 c] "Ireland, Greece, Portugal and Spain as Members of the European Communities; What can we Learn from their Experience", paper prepared in the Kiel Institute of World Economics for a conference to be organized in Warsaw in November 1992.
- , [1992 d] "Kapitał pelen wątpliwości" (Capital Inflow with Reservations), Życie Gospodarcze (Economic Life, weekly), No. 15 from 12.04.1992.
- , Pac R., Kalinowska L. [1991] "Die Möglichkeiten einer Aufrechterhaltung der Handels- und Kooperationsbeziehungen zwischen polnischen Unternehmen und Firmen der DDR", Wirtschafts- und Sozialpolitik, Heft Nr. 14, Friedrich Ebert Stiftung, Warschau.
- NEVEN D.J., Röller L.H. [1992] "The structure and determinants of EastWest trade; a preliminary analysis of the manufacturing sector", in: Winters, Venables [1990].
- POPKIEWICZ J., Ryszka F. [1959] "Przemysł ciężki Górnego Śląska w gospodarce Polski międzywojennej 1922-1933" (Heavy Industry of the Upper Silesia in the Economy of the Inter-war Poland. 1922-1933), Opole.

- RAPORT [1950] "Westdeutschland im Warenaustausch Ost-West vor und nach dem Kriege", Deutsch-Französische Wirtschaftsblätter, Nr. 1.
- SAUTTER H. [1983] "Regionalisierung und komparative Vorteile im internationalen Handel", Tübingen.
- SCHATZ K.-D., Schmidt K.-D. [1992] "German Economic Integration; Real Economic Adjustment of the East German Economy in the Short and in the Long Run" in Siebert [1992 a].
- SCHERFKE K. [1936] "Die Entwicklung der deutsch-polnischen Wirtschaftsbeziehungen unter Berücksichtigung der Ausbaumöglichkeiten", Berlin.
- SIEBERT H. [1990] "The Economic Integration of Germany", Kiel Discussion Papers, No. 160, Institute of World Economics, Kiel.
- , ed. [1992 a] "Transformation of Socialist Economies", Tübingen, 1992.
- , [1992 b] "Drei Fallen für die Wirtschaftspolitik", Frankfurter Allgemeine Zeitung, Nr. 201 vom 29.08.1992.
- SKIBINSKI J. [1974] "Dwa panstwa niemieckie" (Two German States), Warszawa.
- STROBEL G.W. [1990] "Polsko-niemieckie stosunki gospodarcze 1918-1932" (Economic Relations between Poland and Germany in 1918-1932) in: Instytut Zachodni [1990].
- TANGERMANN S. [1992] "Integration der Landwirtschaft Osteuropas in den Europäischen Markt und in den Weltmarkt", Institut für Agrarökonomie der Universität Göttingen, Göttingen, mimeo.
- TOMALA M. [1973] "Polska-RFN. Gospodarka. Stosunki ekonomiczne" (Poland-FRG. Economy. Economic Relations), Warszawa.
- UNITED NATIONS' STATISTICAL PAPERS [1975] "Standard International Trade Classification. Revision 2", Statistical Papers, Series M, No. 34/Rev.2, United Nations, New York, 1975.
- USITC [1991] "Central and Eastern Europe: Export Competitiveness of Major Manufacturing and Services Sector", World Competition, vol. 15, No. 1.
- VERNON R., ed. [1970] "The Technology Factor in International Trade", New York.
- WEGNER M. ed. [1992] "Der Außenhandel Mittel- und Osteuropas beim Übergang zur Marktwirtschaft", Berlin.
- WEISS F.D., [1983] "West Germany's Trade with the East. Hypotheses and Perspectives", Tübingen.
- WINTERS L.A., Venables A.J., eds. [1990] "European integration; trade and industry", Cambridge.
- WORLD BANK [1987] "Poland. Reform, Adjustment, and Growth", vol. I, Washington.
- ZBYTNIIEWSKI D. [1991] "Internationalization and Competitiveness of Polish Economy", Foreign Trade Research Institute, Warsaw.